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Waterford 3

W3F1-99-0149
A4.05
PR

October 28, 1999

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Supplement to Request for Additional Information
Response to Generic Letter 96-06 for the Waterford
Steam Electric Station, Unit 3 (TAC NO. M96883)

Gentlemen:

The purpose of this letter is to provide a supplement to Entergy Operations, Inc.'s (EOI) letter W3F1-97-0278 dated December 22, 1997, in response to the Request for Additional Information (RAI) regarding Generic Letter (GL) 96-06. On January 28, 1997, EOI submitted the response to NRC Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity during Design Accident Conditions," by letter W3F1-97-0017. In this initial response, EOI concluded that the Containment Fan Cooler cooling water system susceptibility to waterhammer and two-phase flow issue was not a concern at Waterford 3, but the evaluation for susceptibility of Containment penetration piping overpressurization due to thermal expansion of fluid identified twelve containment penetrations that were potentially susceptible to thermally induced overpressurization. A supplement to our initial response was submitted by letter W3F1-97-0232, dated October 17, 1997 that identified one additional potentially susceptible containment penetration bringing the total number to thirteen. A RAI regarding the issue of thermally induced overpressurization of Containment penetration piping was issued via NRC Staff letter dated October 15, 1997. EOI responded to the initial RAI by transmittal of letter W3F1-97-0278, dated December 22, 1997. Another RAI regarding the issue of waterhammer and two-phase flow was issued via NRC Staff letter dated July 29, 1998. EOI responded to this second RAI by transmittal of letter W3F1-98-0184, dated October 30, 1998.

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In the EOI response to the containment penetration RAI, via letter W3F1-97-0278, dated December 22, 1997, EOI committed to determine the appropriate actions required to resolve the nonconformance for each containment penetration potentially susceptible to thermally induced overpressurization. In addition, EOI committed to establish work schedules to restore the affected penetrations to their fully qualified state in a manner commensurate with their safety significance by Refueling Outage 10. Consistent with our commitments, the appropriate actions required to resolve the nonconforming containment penetrations have been determined and the work schedules to restore the affected penetrations to their fully qualified state have been established and detailed in Attachment 2.

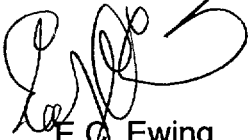
The enclosed supplemental information identifies appropriate actions required to resolve the nonconformance for the thirteen potentially susceptible containment penetrations previously specified in EOI's letter W3F1-97-0232, dated October 17, 1997. However, a further evaluation of the thermally induced piping overpressurization issue determined that an additional four containment penetrations were susceptible (Reference Condition Report 99-0982). These four containment penetrations, that serve the steam generator blowdown and secondary sampling systems, were originally excluded due to the penetration piping containing process fluids at temperatures in excess of the Design Basis Accident (DBA) containment atmosphere temperature of 260°F. This further evaluation determined that these penetrations could contain fluids at temperatures below 260°F during plant heat-up, specifically in Mode 4. This brings the total number of affected containment penetrations to seventeen.

Please note that the additional four penetrations have been evaluated under Condition Report 99-0982 and are in conformance with the conclusions reached in EOI's initial evaluation, documented in letter W3F1-97-0278, that potentially susceptible containment penetrations do not exceed Burst Pressure and do retain the ability to perform their safety function, thereby maintaining containment integrity.

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This letter will complete Waterford 3's response to issues specified in GL 96-06 in order for the NRC Staff to complete their review. This letter also contains commitments that are documented on the attached commitment identification form. Should you have any questions concerning this response, please contact Everett P. Perkins at (504) 739-6379 or Ron Williams at (504) 739-6255.

Very truly yours,



E. G. Ewing
Director
Nuclear Safety Assurance

ECE/RLW/rtk
Attachments

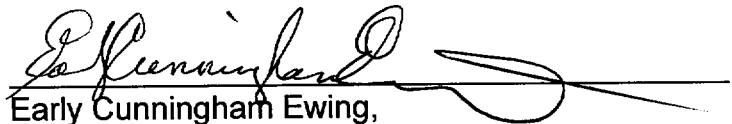
cc: E.W. Merschoff, NRC Region IV
C.P. Patel, NRC-NRR
J. Smith
N.S. Reynolds
NRC Resident Inspectors Office

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of)
)
Entergy Operations, Incorporated) Docket No. 50-382
Waterford 3 Steam Electric Station)

AFFIDAVIT

Early Cunningham Ewing, being duly sworn, hereby deposes and says that he is Director, Nuclear Safety & Regulatory Affairs - Waterford 3 of Entergy Operations, Incorporated; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached supplement to Request for Additional Information Response to Generic Letter 96-06; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.


Early Cunningham Ewing,
Director, Nuclear Safety Assurance
Waterford 3

STATE OF LOUISIANA)
) ss
PARISH OF ST. CHARLES)

Subscribed and sworn to before me, a Notary Public in and for the Parish and State above named this 28th day of October, 1999.



Notary Public

My Commission expires at death.

**Supplement to Request for Additional
Information Response to Generic Letter 96-06**

GL 96-06 postulates that during a Design Basis Accident, water trapped between the inside and outside containment isolation valves could expand due to containment temperature and overpressurize the piping penetration. The internal pressure could cause ASME Code allowable stresses to be exceeded and possibly cause the penetration to fail. EOI documented in letter W3F1-97-0232, dated October 17, 1997, that thirteen containment penetrations were potentially susceptible to this type of overpressurization and issued Condition Report 97-0174 to evaluate operability. The operability evaluation determined that these thirteen containment penetrations may exceed yield stresses resulting in penetration deformation, but catastrophic failure of the penetration and loss of containment integrity would not occur. However, a further evaluation of the thermally induced piping overpressurization issue determined that additional four containment penetrations were susceptible. These four containment penetrations, that serve the steam generator blowdown (penetrations 5 & 6) and secondary sampling systems (penetrations 52 & 68), were originally excluded due to the penetration piping containing process fluids at temperatures in excess of the DBA containment atmosphere temperature of 260°F. This further evaluation determined that these penetrations could contain fluids at temperatures below 260°F during plant heat-up, specifically in Mode 4.

Condition Report 99-0982 was issued to evaluate their operability in accordance with Generic Letter 91-18. The operability evaluation determined that these four containment penetrations may exceed yield stresses, resulting in penetration deformation, but catastrophic failure of the penetration and loss of containment integrity would not occur. The seventeen total numbers of affected containment penetrations are:

Penetration No.	Description
5*	Steam Generator 2 Blowdown
6*	Steam Generator 1 Blowdown
7	Primary Makeup
24	Component Cooling Water Return from Containment
26	Chemical Volume Control Letdown
28	Reactor Coolant Hot Leg Sample
29	Pressurizer Surge Line Sample
30	Pressurizer Steam Space Sample
42	Containment Sump Pump Discharge
43	Reactor Drain Tank Discharge
44	Reactor Coolant Pump Controlled Bleedoff
51	Fuel Pool Ion Exchanger Return
52*	Steam Generator 1 Sample
59	Safety Injection Tank Drain
62	Reactor Cavity Drain Pump Discharge
68*	Steam Generator 2 Sample
71	Demineralized Water to Shutdown Cooling Vacuum Priming Pumps

* Newly identified containment penetrations

The initial scope for addressing the GL 96-06 concerns was to perform EPRI sponsored testing, to demonstrate the piping penetrations would not exceed stresses that would lead to failures. The EPRI sponsored testing was monitored by the Entergy Operations, Inc (EOI) Design Engineering Peer group to ensure all EOI sites would address the GL 96-06 concerns consistently. Phase I testing was completed in 1997 and the results provided additional assurance that the initial operability analysis was accurate, however all issues were not resolved. As the Phase II testing plan was being developed, it was determined that it would be cost prohibitive for EOI to pursue testing to resolve the GL 96-06 issues when all but two utilities withdrew their funding participation for this new testing phase. Therefore, the EOI Design Engineering Peer group recommended in the first quarter of 1999 to resolve the affected containment penetration nonconformance by implementing procedural controls or incorporating design modifications.

Criteria were established to prioritize the resolution of each affected containment penetration based on its safety significance for inclusion in Refuel 10. The margin to containment penetration failure (i.e., burst) was evaluated and found to be essentially equal (at least 20% margin) for all seventeen containment penetrations. Therefore, margin to burst pressure was not considered in prioritizing containment penetration candidates for inclusion in Refuel 10. The criteria and the evaluations of each penetration are as follows:

- Containment Penetrations that could be maintained drained or the valve lineup configuration altered to provide a path for thermal expansion, thereby avoiding any overpressurization, are considered for immediate inclusion in the Refuel 10 scope.

The evaluation of each containment penetration determined that changes to the system configuration could be implemented on penetrations 7, 51, 62, and 71 to resolve the GL 96-06 issue.

- Containment Penetrations serving systems that assist in mitigating the consequences of an accident or affect safe reactor shutdown were then considered.

The evaluations of the remaining thirteen containment penetrations applicable to these criteria include Component Cooling Water (CCW) return (Penetration 24) and Steam Generator (SG) Blowdown (Penetrations 5 and 6). The CCW system supplies cooling water to the Reactor Coolant Pumps (RCP) and the Control Element Drive Mechanism (CEDM) cooling fans during normal operations. Although this equipment is not required to perform a safety-related function, having the RCPs available during design basis accidents could assist in reaching shutdown conditions. SG blowdown is one of several means to control level in the affected SG during a SG tube rupture. Although the SG blowdown system is not safety-related, this system could assist in mitigating the consequences of an accident.

- Containment Penetrations serving systems that are open to the RCS were then considered, since they may contain radioactive effluents post accident.

The evaluations of the remaining ten containment penetrations applicable to these criteria include the CVCS letdown line (Penetration 26), the RCP controlled bleed-off line (Penetration 44), and the RCS sample lines (Penetrations 28, 29 and 30).

Containment penetrations 42, 43, 52, 59 and 68 do not meet the above criteria for safety significance.

For the three RCS sample lines (Penetrations 28, 29 and 30) and the two SG blowdown penetrations (Penetrations 5 and 6), the potential for thermally induced overpressurization of the penetration would only occur during a design basis accident (DBA) with the plant heating up in Mode 4. During Modes 1, 2, and 3 these lines contain high temperature fluid and would not experience thermally induced overpressurization during a DBA. However, during plant heatup the fluid temperature inside these penetrations may be below this expected DBA temperature. Therefore, since the window of vulnerability for thermal expansion is very small and the safety significance of these penetrations is small, their final resolution is being delayed to Refuel 11.

EOI evaluated the safety significance of the GL 96-06 resolution project against other adverse to quality Refuel 10 design modification projects scheduled for the Fall of 2000. Some of these adverse to quality condition projects include the removal of the CCW Makeup single failure vulnerability, RCS nozzle repairs and recovering level in the Reactor Water Storage Pool. In addition, other projects, such as eliminating operator work-arounds, improving industrial safety, and/or improving cost performance were also evaluated for implementation during Refueling Outage 10. The Project Review Committee prioritized these projects according to a disciplined evaluation process. It was determined that the best approach was to resolve the GL 96-06 issue over the next two refueling outages with corrective actions being taken on penetrations that have the highest safety significance. The basis for this decision was that funding and resources needed to complete other adverse to quality condition projects would have a greater impact on plant safety performance as compared to the impact of resolving GL 96-06 nonconforming containment penetrations with low safety significance.

Based on the above safety significance criteria, EOI will resolve the GL 96-06 issue by the following means: (1) prior to startup from Refuel 10, presently scheduled for the Fall of 2000, system configuration changes will be implemented on penetrations 7, 51, 62, and 71 to provide either a path for thermal expansion of trapped fluids or maintain the penetration volume drained to avoid any overpressurization; (2) prior to startup from Refuel 10, administrative controls will be implemented to ensure RCS sample lines (Penetrations 28, 29 and 30) and SG blowdown penetrations (Penetrations 5 and 6) are flushed with hot fluids during plant heatup as an interim resolution to the potential thermal expansion of fluid and overpressurization of the piping section; (3) prior to startup from Refuel 10 physical modifications will be performed on penetrations 24, 26, and 44 to provide relief paths for trapped fluids during accidents or ambient

containment temperature increases in order to avoid the possibility of overpressurization or the need for fluid relief path will be eliminated through reanalysis of the penetration; and (4) prior to startup from Refuel 11, presently scheduled for the Spring of 2002, the low safety significant containment penetrations 42, 43, 52, 59, and 68 nonconformance will be resolved through installation of physical modifications or detailed reanalysis; and a final resolution to RCS sample lines (Penetrations 28, 29 and 30) and the two SG blowdown penetrations (Penetrations 5 and 6) will be performed through installation of physical modifications or detailed reanalysis.

The following tables list the resolution schedule for the affected containment penetrations specified above:

Prior to Startup from Refuel 10, presently scheduled for the Fall of 2000:

Penetration No.	Description	Resolution
7	Primary Makeup	System Configuration Change
51	Fuel Pool Ion Exchanger Return	System Configuration Change
62	Reactor Cavity Drain Pump Discharge	System Configuration Change
71	Demineralized Water to Shutdown Cooling Vacuum Priming Pumps	System Configuration Change
5*	Steam Generator 2 Blowdown	Interim Administrative Controls
6*	Steam Generator 1 Blowdown	Interim Administrative Controls
28*	Reactor Coolant Hot Leg Sample	Interim Administrative Controls
29*	Pressurizer Surge Line Sample	Interim Administrative Controls
30*	Pressurizer Steam Space Sample	Interim Administrative Controls
24	Component Cooling Water Return from Containment	Evaluation/Analysis or Physical Modification
26	Chemical Volume Control Letdown	Evaluation/Analysis or Physical Modification
44	Reactor Coolant Pump Controlled Bleedoff	Evaluation/Analysis or Physical Modification

* Final resolution scheduled for Refuel 11

Prior to Startup from Refuel 11, presently scheduled for the Spring of 2002:

Penetration No.	Description	Resolution
42	Containment Sump Pump Discharge	Evaluation/Analysis or Physical Modification
43	Reactor Drain Tank Discharge	Evaluation/Analysis or Physical Modification
52	Steam Generator 1 Sample	Evaluation/Analysis or Physical Modification
59	Safety Injection Tank Drain	Evaluation/Analysis or Physical Modification
68	Steam Generator 2 Sample	Evaluation/Analysis or Physical Modification
5*	Steam Generator 2 Blowdown	Evaluation/Analysis or Physical Modification
6*	Steam Generator 1 Blowdown	Evaluation/Analysis or Physical Modification
28*	Reactor Coolant Hot Leg Sample	Evaluation/Analysis or Physical Modification
29*	Pressurizer Surge Line Sample	Evaluation/Analysis or Physical Modification
30*	Pressurizer Steam Space Sample	Evaluation/Analysis or Physical Modification

* Interim administrative controls implemented in Refuel 10

COMMITMENT IDENTIFICATION/VOLUNTARY ENHANCEMENT FORM

Attachment 3 to W3F1-99-0149

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COMMITMENT(S)	ONE-TIME ACTION*	CONTINUING COMPLIANCE *	SCHEDULED COMPLETION DATE (IF REQUIRED)	ASSOCIATED CR OR ER
Prior to startup from Refuel 10, resolve the GL 96-06 issue by the implementation of system configuration changes to penetrations 7, 51, 62, and 71 to provide either a path for thermal expansion of trapped fluids or maintain the penetration volume drained to avoid any overpressurization.		X	12/1/00	CR-97-0174
Prior to startup from Refuel 10, resolve the GL 96-06 issue on CCW Return (Penet. 24), CVCS Letdown line (Penet. 26), and RCP Controlled Bleed-off (Penet. 44) by the performance of physical modifications to provide relief paths for trapped fluids during accidents or ambient containment temperature increases in order to avoid the possibility of overpressurization or eliminate the need for fluid relief path through reanalysis of the penetration.	X		12/1/00	CR-97-0174
Prior to startup from Refuel 11, resolve the GL 96-06 issue on PZR Steam Space Sample; Penet-42, Containment Sump Pump Discharge; Penet-43, Reactor Drain Tank Discharge; Penet-52, S/G 1 Sample; Penet-59, SIT Drain; and Penet-68, S/G 2 Sample through installation of physical modifications or detailed reanalysis; and perform a final resolution to Penet-5, S/G 2 Blowdown; Penet-6, S/G 1 Blowdown; Penet-28, RC Hot Leg Sample; Penet-29, PZR Surge Line Sample; and Penet-30, PZR Steam Space Sample through installation of physical modifications or detailed reanalysis.	X		5/1/02	CR-97-0174 CR-99-0982
Prior to startup from Refuel 10, implement administrative controls to ensure RCS sample lines (Penetrations 28, 29 and 30) and SG blowdown penetrations (Penetrations 5 and 6) are flushed with hot fluids during plant heatup as an interim resolution to the potential thermal expansion of fluid and overpressurization of the piping section. This commitment can be closed out with final resolution in Refuel 11.		X	12/1/00	CR-97-0174 CR-99-0982