ENTERGY

Entergy Operations, Inc.
P.O. Box B
Killona, LA 70066-0751
Tel 504 739 6660

Mike Sellman
Vice President, Operations
Waterford 3

W3F1-96-0208
A4.05
PR

November 15, 1996

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
Technical Specification Change Request NPF-38-187

Gentlemen:

By letter W3F1-96-0207 dated November 15, 1996 Waterford 3 indicated that a proposed license amendment request would be submitted to reclassify several valves currently identified as containment isolation valves. Attached for your review and approval is a proposed technical specification (TS) change that will alter the scope of Limiting Condition for Operation (LCO) 3.6.3 Containment Isolation. This LCO requires all containment isolation valves to be operable. Containment isolation valves are identified in the design and licensing basis of the plant. Waterford 3 believes that the attached description and safety analysis provides the justification to eliminate certain valves from the scope of TS 3.6.3 while continuing to comply with applicable General Design Criteria.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(c) and it has been determined that these changes involve no significant hazards considerations. The bases for these determinations are included in the attached submittal.

Waterford 3 requests that the effective date for this change be within 30 days of NRC issuance of the amendment to allow for distribution and procedural revisions necessary to implement this change.

A001 1/1

Should you have any questions or comments concerning this request, please contact Mr. James Fisicaro at (504)739-6242.

Very truly yours,

M.B. Sellman

M.B. Sellman
Vice President, Operations
Waterford 3

MBS/PLC/ssf
Attachment: Affidavit
NPF-38-187

cc: L.J. Callan, NRC Region IV
C.P. Patel, NRC-NRR
R.B. McGehee
N.S. Reynolds
NRC Resident Inspectors Office
Administrator Radiation Protection Division
(State of Louisiana)
American Nuclear Insurers

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

AFFIDAVIT

Michael Bruce Sellman, being duly sworn, hereby deposes and says that he is Vice President Operations - Waterford 3 of Entergy Operations, Incorporated; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached Technical Specification Change Request NPF-38-187; 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.

Michael Bruce Sellman
Vice President Operations - Waterford 3

STATE OF LOUISIANA)
) ss
PARISH OF ORLEANS)

Subscribed and sworn to before me, a Notary Public in and for the Parish and State above named this 15th day of NOVEMBER, 1996.

Notary Public

My Commission expires LIFE.

DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-38-187

This proposed change will alter the scope of the Containment Spray (CS) containment isolation valves that are governed by TS 3.6.3. This change will not result in a change to the TS. The change will affect the current list of containment isolation valves located in licensee controlled documents. The proposed change seeks NRC review and approval of alternate isolation barriers.

Under the provisions of the GDC, containment piping penetrations must incorporate two (redundant) isolation valves except in cases where an alternative arrangement is acceptable under "other defined basis". An acceptable alternative under "other defined basis" is the case where a qualified closed system outside containment may be credited as one of the redundant containment isolation barriers. Paragraph 3.6.7 of N271-1976/ANS-56.2, "American National Standard Containment Isolation Provisions for Fluid Systems," which is endorsed by RG 1.141, specifies the design criteria applicable to a closed system outside containment. Under the terms of these criteria, a single Containment Isolation Valve (CIV) in conjunction with a qualified closed system constitutes an acceptable containment piping penetration arrangement.

Waterford 3 believes that during post accident conditions the CS system qualifies as a closed system outside containment. Therefore, where the CS containment penetrations presently contain two CIV's and a qualified closed system outside containment, the valves outside containment, CS-125 (A&B), may be reclassified and no longer be considered CIVs.

The reclassified CS-125 (A&B) valves would continue to have safety functions for engineered safety feature system operability purposes. ASME Section XI Inservice Testing Program would perform testing to periodically verify continued operability. However, the valves would not be governed by TS LCO 3.6.3.

Concerns due to the lack of testing containment isolation valve air accumulators in the Containment Spray System were identified during an NRC inpcection conducted at Waterford 3 on October 21 1996. Waterford 3 currently has completed testing of these air accumulators. In addition Waterford 3 performs leak testing pursuant to ASME Section XI on the following valves (see Attached Figure 01): SI-107, SI-120, SI-121, SI-417, CS-118. This testing along with periodic inspections for leak tight integrity of the CS system ensures that multiple barriers are in place.

Discussion

The CS system provides borated water spray for post accident heat removal, pressure reduction and iodine removal from the containment atmosphere. A simplified diagram of the CS system is provided in the attached Figure 01. The system is actuated when the Safety Injection Actuation Signal (SIAS) and the Hi HI Containment Pressure are in coincidence. This generates a Containment Spray Actuation Signal (CSAS) which starts the spray pumps and opens the containment spray header isolation valves CS-125 (A&B) The pumps initially draw a suction from the Refueling Water Storage Pool (RWSP) and deliver borated water to the spray nozzles located at the top of containment. This is called the injection mode. Another mode of operation called the recirculation mode, is automatically initiated by the Recirculation Actuation Signal (RAS) after a low-low level is reached in the RWSP. During this mode of operation, the suction for the spray pumps is taken from the Safety Injection System Sump at the bottom of containment. During normal plant operation, the CS system piping is maintained full of water to reduce the CS response time after a CSAS. This response time requires a fast acting valve to meet the accident analysis assumptions.

Containment spray piping penetrates the reactor containment and connects directly to the containment atmosphere. As such these penetrations are subject to GDC 56.

Criterion 56-Primary containment isolation.

Each line that connects directly to the containment atmosphere and penetrates primary reactor containment shall be provided with containment isolation valves as follows, unless it can be demonstrated that the containment isolation provisions for a specific class of lines, such as instrument lines, are acceptable on some other defined basis:

> *(1) One locked closed isolation valve inside and one locked closed isolation valve outside containment; or*
>
> *(2) One automatic isolation valve inside and one locked closed isolation valve outside containment; or*
>
> *(3) One locked closed isolation valve inside and one automatic isolation valve outside containment. A simple check valve may not be used as the automatic isolation valve outside containment; or*
>
> *(4) One automatic isolation valve inside and one automatic isolation valve outside containment.*

A simple check valve may not be used as the automatic isolation valve outside containment. Isolation valves outside containment shall be located as close to the containment as practical and upon loss of actuating power, automatic isolation valves shall be designed to take the position that provides greater safety.

The CS system contains 10 inch check valves CS-128 (A&B) located inside containment which perform a containment isolation function. Valves CS-129 (A&B) are 1/2 inch solenoid operated globe valves located inside containment in parallel with CS-128 (A&B) and are opened only when riser water level indication is required. CS-129 (A&B) also performs a containment isolation function. The outside containment isolation valves CS-125 (A&B) are pneumatic operated gate valves which are designed to open upon initiation of a CSAS. These valves are designed to fail open and are not equipped with an installed overriding feature that will defeat the system actuation demand and facilitate closure, nor do they receive an automatic closure signal.

The CS isolation valves (CS-125, CS-128 and CS-129) are not Type C leak tested pursuant to 10 CFR Appendix J.

The proposed change will modify the licensing basis such that CS-125 (A&B) will no longer be CIVs. The proposed change is considered an enhancement that would provide for a level of protection commensurate with the systems predominate accident mitigation safety function. The proposed change will credit a closed system outside containment as a redundant isolation barrier as described below.

Per ANS-N271-1976 if a closed system outside containment is used as one of the two containment isolation barriers for an engineered safety feature or engineered safety feature related system, the system shall:

- Not communicate with the outside atmosphere
- Meet Safety Class 2 design requirements
- Withstand temperature and internal pressure equal to the containment design conditions
- Withstand loss of coolant accident transient and environment
- Meet Seismic Category I design requirements
- Be protected against overpressure from thermal expansion when isolated, if required
- Be protected against a high energy line break outside of containment when the closed system is needed for containment isolation

A closed system outside containment can be credited as a containment isolation barrier. The Waterford 3 Containment Spray System meets the above requirements, with one exception: the system takes suction from the Refueling Water Storage Pool (RWSP) which is located outside the Controlled Ventilation Area System boundary and vented to atmosphere. However, details provided below demonstrate that the containment atmosphere will not communicate with the RWSP post-accident.

Analysis of the containment penetration barriers for Containment Spray System penetrations (34, 35) indicates that a loop seal is present except for a short period under worse case conditions. This short period is dependent upon the time required to switch from taking pump suction from the RWSP to the SI Sump. Once the suction is switched to the SI sump after a RAS, a loop seal is maintained at the level of the SI

sump due to the same pressure being applied to both the suction and discharge piping. This loop seal assures that the containment atmosphere will not communicate with the RWSP post-accident. To challenge the seal prior to RAS, containment pressure must be greater than the elevation head of the RWSP. The minimum containment pressure required to overcome RWSP head, at low level is approximately 29 psia. Since the peak containment pressure for the limiting accident is approximately 59 psia, the maximum allowable leak rate through the existing mechanical barriers can be determined based on the time required to reach RAS.

Assuming TS maximum level in the RWSP and only one CS pump operating, the maximum time required to reach RAS is less than 5 hours. After RAS is reached, a loop seal is maintained at the Safety Injection Sump elevation. Leak rate acceptance criteria for the existing mechanical barriers, CS-117 (A&B) and CS-118 (A&B), will be established to maintain the CS system water filled prior to a RAS. CS-117 is a 10 inch stop check valve that isolates the Containment Spray System to initiate Shutdown Cooling. CS-118 is a normally closed 4 inch manual gate valve located in the CS long flow recirculation line back to the RWSP. These barriers will assure no containment atmospheric leakage back to the RWSP. After a RAS, a loop seal at the level of the SI sump will maintain the CS system water filled preventing containment atmosphere from escaping.

GDC 56 states, in part, "A simple check valve may not be used as the automatic isolation valve outside containment. Isolation valves outside containment shall be located as close to the containment as practical...." The valves that will be credited as providing a barrier would not be credited as providing isolation of containment atmosphere but rather maintaining a water barrier. A gross passive failure in this ESF concurrent with a LOCA is not considered credible due to the design qualification requirements that have been imposed on this line. Leakage due to passive failure in these lines will be limited to leakage from failed valve packing or mechanical seal rather than the complete severance of the line. This is consistent with ANSI N658 Single Failure Criteria for PWR Fluid Systems, Section 3.6. Leakage of this nature is precluded by testing and inspection at periodic intervals. Waterford 3 believes that this proposed change is an acceptable alternative isolation barrier per the provision of GDC 56 "other defined basis." The system design, post accident function and proposed testing assure that the system can be maintained water filled post-accident, assuming any single active failure. Therefore, a closed system outside containment can be credited as the containment isolation barrier and CS-125 (A&B) will no longer be designated as CIVs.

CS-117 and CS-118 would serve two safety related functions-1) to maintain a water seal preventing containment atmosphere from escaping and 2) preventing back leakage of contaminated water to the RWSP. CS-117 and CS-118 are also located within the CVAS boundary. Waterford 3 performs leak testing pursuant to ASME Section XI on the following valves: SI-107, SI-120, SI-121, SI-417, CS-118. The proposed change would prescribe leak testing on Check valve CS-117 pursuant to ASME Section XI. CS-117 and CS-118 would be identified as containment isolation valves and CS-125 (A&B) would no longer be designated as CIVs.

Safety Analysis

The proposed change described above shall be deemed to involve a significant hazards consideration if there is a positive finding in any of the following areas:

1. Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed change will eliminate CS-125 (A&B) from the containment isolation valve category. These valves are installed in a water-filled, Safety Class 2, Seismic Category 1 ESF system line. These CS lines are equipped with a check valve inside containment in addition to the valves that will be credited as maintaining a water barrier. CS-128, CS-117 and CS-118 will be identified as CIVs in the design basis and subject to the operability requirements specified in the TS. CS-117 and CS 118 will be leak tested to assure that they are capable of maintaining a water barrier. The piping serving this ESF system during post accident conditions constitutes a closed system outside containment. The dual barriers provided by the CIV's and closed pressure boundary outside containment provide for an acceptable containment isolation barrier and may be approved under the provision of "other defined basis" in GDC 56. These dual barriers prevent post-accident containment leakage and provide protection against postulated single failures. Therefore, the post-accident integrity of the containment can be assured following the removal of the subject valves from the scope of TS 3.6.3.

   The proposed change does not affect the design, functions, and operation of these valves. The valves will remain fully operational and capable of performing their required system and safety-related functions. Other applicable requirements imposed by TS are not affected by this amendment application.

   The valves included in this application will continue to be inspected and tested per the applicable requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME XI) in accordance with TS 4.0.5 and the Waterford 3 IST Testing Program.

   The proposed change does not change the physical plant or the manner in which it is operated. The change will not affect tests needed to assure required containment isolation capabilities. The new bases for satisfying GDC 56 provide equivalent levels of protection against offsite radiation releases. Therefore, the proposed change will not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. Will operation of the facility in accordance with this proposed change create the possibility of a new or different type of accident from any accident previously evaluated?

Response: No.

This proposal does not involve any hardware or logic changes, nor does it alter the way in which any plant systems operate. Post-accident containment isolation features and system interfaces are not affected by the change. The CS system will continue to provide it's safety related accident mitigation function as described in the FSAR.

Therefore, the proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?

Response: No

Removing CS-125 (A&B) valves from the Containment isolation valve category will not adversely affect the margins of safety associated with the plant's licensing basis. The margin of safety associated with the containment barrier will be preserved by continuing to comply with two redundant containment isolation barriers. The use of tested CIV's inside containment in conjunction with the closed pressure boundary piping and water seal outside containment, provides a redundant barrier against containment leakage and provides protection against postulated single failures. The subject valves will be tested in accordance with ASME Section XI as required. The leak tight integrity of the systems located outside containment will continue to be periodically tested at system operating pressures.

Since the valves and system leakage boundaries are located within an area serviced by the Controlled Ventilation Area System, bypass leakage is not expected to occur. These areas are radiologically controlled and monitored. Thus, the proposed change will not result in an increased radioactive release to the environment.

Therefore, the proposed change will not involve a significant reduction in a margin of safety.

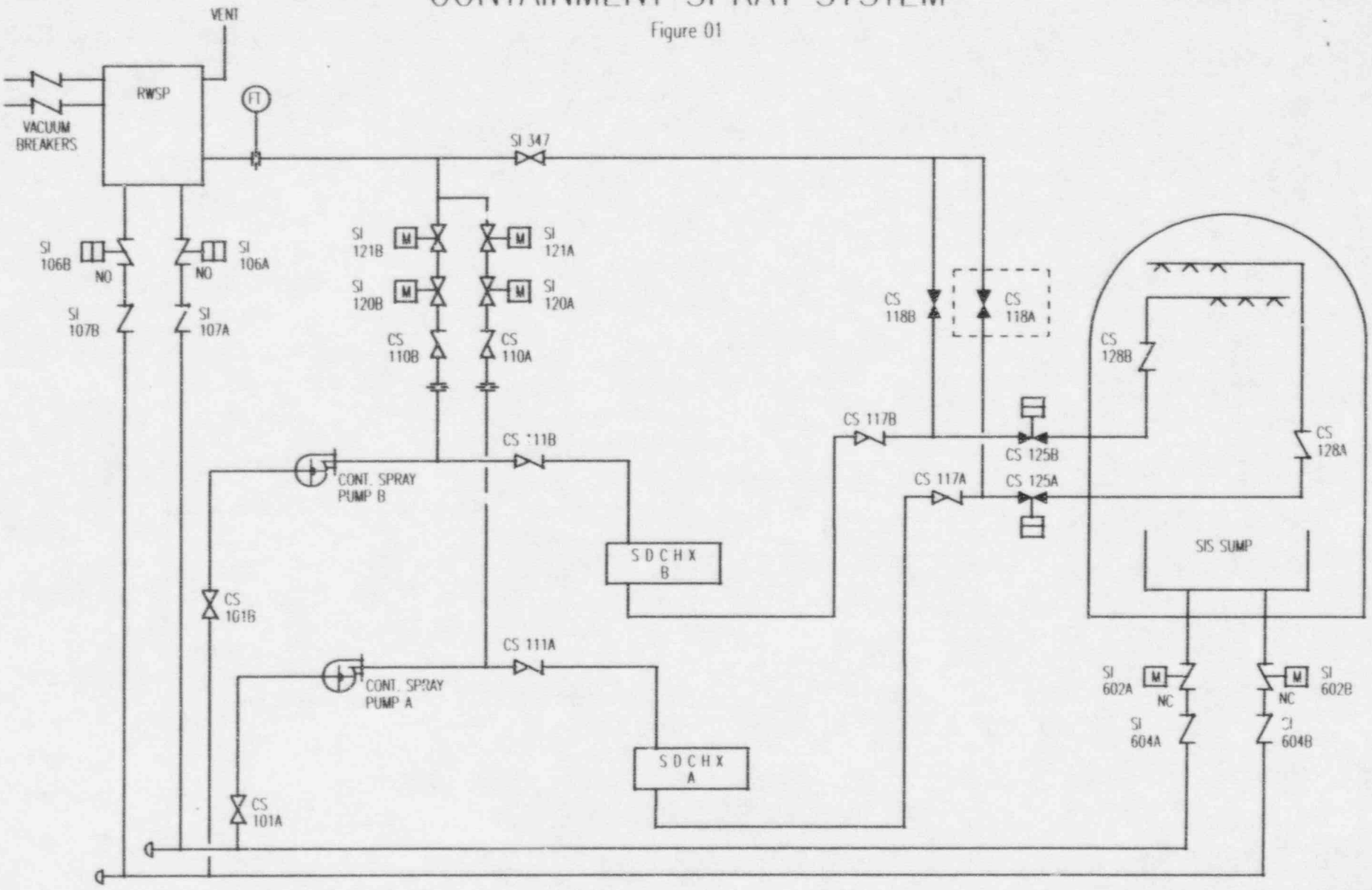
Safety and Significant Hazards Determination

Based on the above safety analysis, it is concluded that: (1) the proposed change does not constitute a significant hazards consideration as defined by 10CFR50.92; and (2) there is a reasonable assurance that the health and safety of the public will not be endangered by the proposed change; and (3) this action will not result in a condition which significantly alters the impact of the station on the environment as described in the NRC final environmental statement.

W3F1-96-0208
ATTACHMENT

CONTAINMENT SPRAY SYSTEM

Figure 01



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