

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

Charles M. Dugger  
Vice President, Operations  
Waterford 3

W3F1-97-0137  
A4.05  
PR

June 3, 1997

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-38-198

Gentlemen:

The attached description and safety analysis support a change to the Waterford 3 Technical Specifications (TS). The proposed change modifies the ACTION Requirements for Technical Specification 3/4.3.2 for the Safety Injection System Sump Recirculation Actuation Signal (RAS). A change to the Technical Specification Basis Section 3/4.3.2 has been included to support this change. Waterford 3 will institute appropriate precautions which will require a plant shutdown if a RAS channel is maintained in the tripped condition.

On May 14, 1997 Waterford 3 was informed by Arkansas Nuclear One of the potential for the High Pressure Safety Injection pumps and Containment Spray pumps to have their suctions supplied by inadequate source of water and the Low Pressure Safety Injection pumps would stop as a result of a single failure with one RAS channel in the tripped condition. Upon review, it has determined that a similar situation could occur at Waterford 3.

Waterford 3 is currently reviewing other Engineered Safety Features Actuation System (ESFAS) Instrumentation circuits to ascertain if a single failure could prevent the fulfillment of a design safety function. If any conditions comparable to RAS are discovered as a result of this review, Waterford 3 will institute appropriate precautions similar to those for RAS.

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This proposed change has been evaluated in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and it has been determined that this request involves no significant hazards consideration.

The circumstances surrounding this change do not meet the NRC's criteria for exigent or emergency review. However, due to the significant impact on plant operations, we respectfully request an expeditious review. Entergy Operations requests the effective date for this change be within 60 days of approval.

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

Very truly yours,



C. M. Dugger  
Vice President, Operations  
Waterford 3

CMD/CWT/ssf

Attachment: Affidavit  
NPF-38-198

cc: E.W. Merschoff, NRC Region IV  
C.P. Patel, NRC-NRR  
J. Smith  
N.S. Reynolds  
NRC Resident Inspectors Office  
Administrator Radiation Protection Division  
(State of Louisiana)  
American Nuclear Insurers

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

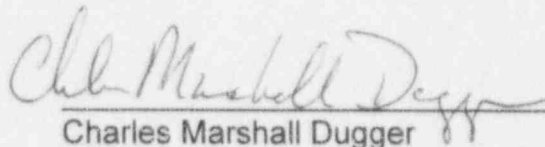
In the matter of )

Entergy Operations, Incorporated )  
Waterford 3 Steam Electric Station )

Docket No. 50-382

AFFIDAVIT

Charles Marshall Dugger, 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-38-198; 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.




Charles Marshall Dugger  
Vice President Operations - 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 22<sup>nd</sup> day of June, 1997.

  
Notary Public

My Commission expires at death.

## DESCRIPTION AND SAFETY ANALYSIS OF PROPOSED CHANGE NPF-38-198

The proposed change requests a change to the ACTION Requirements for Technical Specification 3/4.3.2 for the Safety Injection System Sump Recirculation Actuation Signal (RAS). This change revises the allowed outage time for a channel of RAS to be in the tripped condition from "prior to entry into the applicable MODE(S) following the next COLD SHUTDOWN" to the more restrictive time limit of 48 hours and adds a shutdown requirement. Additionally, the 3.0.4 exemption is being removed from the ACTION for the tripped condition. A change to the Technical Specification Basis Section 3/4.3.2 has been included to support this change.

### Existing Specification

See Attachment A

### Proposed Specification

See Attachment B

### Background

The Safety Injection System Sump Recirculation Actuation Signal (RAS) is initiated by a 2 out of 4 logic for the Refueling Water Storage Pool (RWSP) low signal. If this occurs in conjunction with a containment spray actuation signal or a safety injection actuation signal, the RAS system will change the mode of operation of the Containment Spray (CS) System and the Safety Injection System. The RAS automatically stops the Low Pressure Safety Injection (LPSI) pumps and changes the CS and High Pressure Safety Injection (HPSI) pump suction from the RWSP to the Safety Injection System Sump. The RAS is designed to automatically realign the CS and HPSI systems for long term operation following a Design Basis Accident by diverting the suction of these pumps from the RWSP to the Safety Injection System Sump, when the contents of the RWSP are nearing depletion.

The concern occurs when one channel of the RAS is in the "tripped" condition and a loss of coolant accident or excess steam demand event occurs. In these scenarios, prior to the RWSP reaching the low level setpoint, a failure occurs such that a second channel produces a low level trip signal. If this were to occur prior to there being adequate water in the Safety Injection System Sump from the reactor coolant system leak and containment spray, the HPSI pumps and CS pumps would have their suctions supplied by inadequate source of water and the LPSI pumps would stop. Although the RWSP outlet valves would remain open, the containment pressure would rise above RWSP outlet pressure, which would cause the RWSP outlet check valves to seat. In effect, this would allow a single failure (the failure of the second channel of RAS in the tripped condition) to remove both trains of HPSI, LPSI, and CS from service.

## Description

The current TS ACTION 13 requires that, with one inoperable RAS channel, the channel be placed in the bypass or tripped condition within 1 hour. With 2 channels of RAS inoperable, TS ACTION 14 requires that one inoperable channel be placed in trip and the other inoperable channel be placed in bypass. In ACTION 13, continued operation is allowed in this configuration until entry into the applicable MODEs following the next COLD SHUTDOWN. If the failures occurred at the start of a operating cycle, there is the potential for a channel to be in the bypassed condition for up to a maximum of 18 months. In ACTION 14, continued operation is allowed in the tripped condition until performance of the next required CHANNEL FUNCTIONAL TEST, which could be in three months.

Waterford 3 proposes to limit the time that one channel of RAS can be in the tripped condition to 48 hours. The revised ACTIONS have been renumbered as ACTIONS 19 and 20. As the bypass function places RAS system in a 2 out of 3 logic, use of the bypass feature is not a concern as, with the resulting logic, a single failure would not cause a premature suction transfer. ACTION 19 has been revised to refer to the condition of one inoperable channel. The channel may be placed in the bypassed condition until the next entry into COLD SHUTDOWN. If placed in the tripped condition, compliance with ACTION 20b is required. The 48 hours of ACTION 20 for the channel to be in the tripped condition is based on operating experience, which has demonstrated that a random failure of a second channel occurring during the 48 hour period is a low probability event. This allowed outage time for the tripped condition is consistent with the currently allowed time for Combustion Engineering plants that do not have indefinite bypass. This is more conservative than the allowed outage time of 72 hours for a complete train of Emergency Core Cooling System (TS 3.5.2) and Containment Spray (TS 3.6.2.1). Since the allowed outage time for a channel of RAS is being limited to 48 hours, this is considered an off-normal operation and a single failure is not required to be postulated during a Design Basis Accident in the accident analysis.

The probability of the premature RAS is remote. Based on the failure rate of these instruments, two concurrent failures would be highly unlikely. For this scenario to occur the initial conditions of one channel in the bypassed condition and one channel in the tripped condition would have to be in effect. This would be due to a failure in one channel and either a failure or testing in another channel. During the time that one channel was in the bypassed condition and the second channel in the tripped condition, a loss of coolant accident or main steam line break inside containment would have to occur. The failure of a third channel would have to occur precisely at the time during an accident that the Emergency Core Cooling System (ECCS) was in the injection mode, and prior to the ECCS being in the recirculation mode. An inadvertent RAS actuation in the recirculation mode would be of no consequence as the components are already aligned for RAS at that time. This period of time for vulnerability to this scenario ranges from approximately 6 minutes to 14 minutes (based on accident conditions) for the main



steam line break as listed in FSAR Tables 15.1-13 and 15.1-14. For a loss of coolant accident, a variety of times can be postulated depending on break size, however, typically, operator action may be credited after 30 minutes to mitigate the consequences of an accident. Thus, the exposure would be limited to a 30 minute period during a loss of coolant accident. In summary, for a premature RAS to occur, two channels would have to initially be out of service and a third channel fail to the actuated condition (a highly unlikely event) and the third failure would have to occur precisely during the injection phase of a main steam line break or loss of coolant accident (an even more remote possibility). Therefore, the allowed outage time of 48 hours is acceptable.

Due to the addition of a specified allowed outage time the 3.0.4 exemption is no longer applicable; therefore the asterisk is being removed from the ACTION for the tripped condition (ACTION 20). The 3.0.4 exemption is still applicable for the bypassed condition (ACTION 19) as the allowed outage time for the bypassed condition remains until entry into the applicable MODEs following the next entry into COLD SHUTDOWN, as before.

An expanded Bases, consistent with NUREG 1432, "Standard Technical Specifications - Combustion Engineering Plants." has been added to support this change.

#### 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 revision to the TS changes the allowed outage time that a channel of RAS can be in the tripped condition from a maximum of approximately 18 months when one channel is inoperable and 92 days when two channels are inoperable to 48 hours. If a channel were in the tripped condition and a single failure occurred (that of one other channel of RAS), a premature RWSP low level signal would be generated. During a Design Basis Accident with a containment high pressure condition causing the RWSP outlet check valves to seat, this single failure would prevent the contents of the RWSP from being injected into the reactor coolant system and possibly resulting in failure of both trains of ECCS and CS. Additionally, this would cause the LPSI pumps to stop. Reducing the time that a channel of RAS can be placed in the tripped condition

will reduce the probability of this scenario occurring during a Design Basis Accident. Since the allowed outage time for a channel of RAS is being limited to 48 hours, this is considered an off-normal operation and a single failure is not required to be postulated during a Design Basis Accident in the accident analysis. Reducing the time the channel can be placed in the tripped condition and thus, the exposure time to this scenario, would not be an accident initiator. The proposed change of being more conservative in the time and condition limits in the TS will not affect the assumptions, design parameters, or results of any accident previously evaluated.

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.

The proposed change does not change the design or configuration of the plant. The proposed change provides a more conservative allowed outage time for the channel to be in the tripped condition. There has been no physical change to plant systems, structures or components nor will the proposed change reduce the ability of any of the safety-related equipment required to mitigate Anticipated Operational Occurrences or accidents. In fact, this change will potentially increase the ability of safety related equipment to perform its functions. The configuration required by the proposed specification is permitted by the existing specification.

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

The proposed change provides a more conservative allowed outage time for the channel to be in the tripped condition. By reducing the allowed outage time, the probability is reduced that a single failure (that of a failure of one channel of RAS with one channel in the tripped condition) would occur that would cause the suction to be prematurely supplied by the Safety Injection System Sump, potentially disabling the HPSI and CS pumps, and stopping of the LPSI pumps.

Therefore, the only change to the margin of safety would be an increase. Since the allowed outage time for a channel of RAS is being limited to 48 hours, this is considered an off-normal operation and a single failure is not required to be postulated during a Design Basis Accident in the accident analysis. The proposed changes do not affect the limiting conditions for operation or their bases.

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.