



Entergy

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W3F1-97-0051  
A4.05  
PR

April 11, 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-38-190

Gentlemen:

The attached description and safety analysis support a change to the Waterford 3 Technical Specifications to delete TS 3.7.1.3, Action (b) and its associated surveillance requirement.

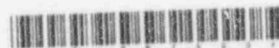
The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(c) and it has been determined that the change involves no significant hazards consideration. The bases for these determinations are described in the attached submittal.

The circumstances surrounding this change do not meet the NRC's criteria for exigent or emergency review. However, the current TS is non-conservative and administrative controls are in place to prohibit the configuration allowed by TS 3.7.1.3, Action (b). Entergy requests the effective date of this change coincide with the completion of its refueling outage scheduled to begin April 11, 1997, since it has been identified that this is a startup mode restraint.

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Technical Specification Change Request NPF-38-190

W3F1-97-0051

Page 2

April 11, 1997

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

Very truly yours,

A handwritten signature in cursive script, appearing to read "C.M. Dugger".

C.M. Dugger  
Vice President, Operations  
Waterford 3

CMD/ELL/ssf

Attachment: Affidavit  
NPF-38-190

cc: E.W. Merschoff, 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

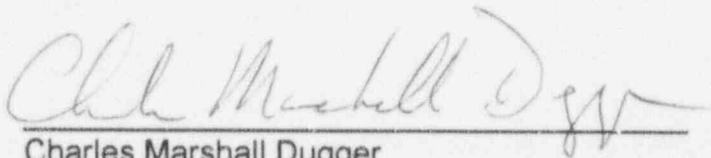
In the matter of )

Entergy Operations, Incorporated )  
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-38-190; 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.



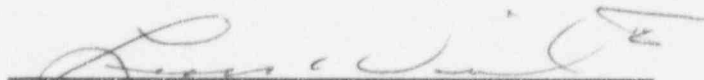
Charles Marshall Dugger  
Vice President Operations - Waterford 3

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 11<sup>th</sup> day of April, 1997.



Notary Public

My Commission expires at death

## DESCRIPTION AND SAFETY ANALYSIS OF PROPOSED CHANGE NPF-38-190

The proposed change modifies existing Technical Specification 3.7.1.3 by deleting Action (b) and its associated surveillance requirement. The current technical specification allows the Wet Cooling Tower (WCT) basins to be used as the primary supply to the Emergency Feedwater (EFW) pumps extending EFW system operability up to 7 days in the unlikely event that the Condensate Storage Pool (CSP) were to become inoperable for greater than 4 hours.

### Existing Specification

See Attachment A

### Proposed Specification

See Attachment B

### Background

The Emergency Feedwater system (EFW) provides cooling water to one or both steam generators for the purpose of removing decay heat from the Reactor Coolant system (RCS) in response to any event causing low steam generator level coincident with the absence of a low steam generator pressure condition.

The EFW system is comprised of two independent flow paths from the Condensate Storage Pool (CSP) to connections at the two main feedwater lines. One (noncondensing steam) turbine-driven pump and two motor-driven pumps supply a common discharge header that supplies both steam generator flow paths. Each pump has a minimum re-circulate flow path back to the CSP.

The primary source of EFW is the CSP. The CSP is a stainless steel lined, reinforced concrete Seismic Category I pool located within the Reactor Auxiliary Building (RAB). The CSP has a capacity of approximately 210,000 gallons and must be operable in modes 1, 2, and 3 with a contained volume of at least 91% indicated level which ensures 170,000 gallons useful volume of water is available (See NOTE following this paragraph). The operability of the CSP with the minimum water volume provides the primary source of water to cool the RCS to shutdown cooling entry conditions following any design basis accident. An additional source of water is stored in the WCT basins providing the capability to maintain Hot Standby conditions for at least an additional 2 hours prior to initiating shutdown cooling. The total capacity (CSP plus one WCT basin) also provides sufficient cooling for 24 hours until shutdown cooling is initiated in the event the Ultimate Heat Sink (UHS) sustains tornado damage concurrent with the event. If natural circulation is required, the combined capacity (CSP and WCTs) is

sufficient to maintain the plant at Hot Standby for 4 hours, followed by a cooldown to shutdown cooling entry conditions assuming the availability of only onsite power or only offsite power, and the worst single failure (loss of a diesel generator or atmospheric dump valve).

NOTE: Technical Specification Change Request NPF-38-179 was submitted on July 17, 1996, for TS 3.7.1.3 to increase the minimum required contained water volume from 82 percent to 91 percent indicated level. This proposed change is required to ensure the minimum useable water volume in the Condensate Storage Pool is maintained greater than or equal to 170,000 gallons. The new minimum level is required to account for instrument measurement uncertainties and to prevent Emergency Feedwater pump suction line vortexing.

The purpose of the ACCW system is to provide a separate support system that removes heat from the CCW system via the CCW Heat Exchangers. ACCW is then pumped to the WCTs for heat rejection to atmosphere. In conjunction with CCW, the ACCW system must be able to perform the following safety related functions: (1) remove the heat from containment and reject the heat via the cooling towers to the atmosphere following a Loss of Coolant Accident (LOCA) or a Main Steam Line Break (MSLB); and (2) supply cooling water to essential equipment during accidents. The volume of water in a single wet cooling tower basin is sufficient to bring the plant to safe shutdown during all accident conditions.

The current Waterford 3 Technical Specification 3.7.1.3 limiting condition for operation (LCO) was modeled according to NUREG-0212, Revision 3, "Combustion Engineering - Standard Technical Specifications", which provides for an alternate supply for emergency feedwater in the event the condensate storage pool is unavailable as the primary source.

Surveillance 4.7.1.3.2 is being deleted since use of the WCT basins as the backup supply as described in the current Action (b) will no longer be allowed.

#### Description

The EFW system must remain functional during and after a design basis event to ensure the system is capable of removing decay heat from the RCS until shutdown cooling entry conditions are reached. The EFW system must also be able to perform its safety function in the event of a single active failure.

The ACCW system must be available to perform its intended function to remove the heat from CCW and reject the heat via the cooling towers to the atmosphere following a LOCA or a MSLB inside containment.

For purposes of this TS change request, it is important to distinguish between: 1) the use of the WCT basins as an additional source to CSP during a design basis event,

and 2) use of the WCT basins as the primary EFW supply when the CSP is inoperable for more than 4 hours (as allowed by the current TS).

#### Use of the WCT Basins as an Additional Source to CSP

There are three accident scenarios for which the WCT basins are used as an additional source to CSP: 1) natural circulation cooldown (Branch Technical Position BTP RSB 5-1); 2) a design basis tornado; and, 3) long-term cooling. Each accident scenario assumes the 170,000 gallons available in the CSP is exhausted first and then additional water is supplied by the WCT basins.

BTP RSB 5-1 requires the EFW system to have sufficient inventory to allow operation at Hot Standby conditions until entry into shutdown cooling. This is based on the longest cooldown time needed with either only onsite power or offsite power available and with an assumed single failure. For W3, the amount of water required to satisfy this requirement is approximately 246,000 gallons. Since the minimum amount of water available in the CSP is approximately 170,000 gallons, 76,000 gallons are required from the WCT basin. This water is required to remove decay heat and sensible heat for the cooldown to shutdown cooling conditions.

During a design basis tornado, approximately 340,000 gallons are required for EFW consumption during the first 24 hours of the event. Based on TS required levels, the contents of the CSP (170,000 gallons) and a WCT basin (174,000 gallons) are required to supply this volume of water.

Long-Term Cooling (LTC) is initiated when the core is reflooded after a LOCA and is continued until the plant is secured. The objective of LTC is to maintain the core at safe temperature levels while avoiding the precipitation of boric acid in the core region. The appropriate procedure for the LTC plan depends on the break size. Shutdown Cooling (SDC) is initiated if the break is sufficiently small that successful operation is assured. However, for large break LOCA's, simultaneous hot and cold leg injection will maintain core cooling and boric acid flushing. The plant operator initiates the appropriate procedure to be used based on the Reactor Coolant System pressure. The LTC analysis in FSAR section 6.3.3.4.1, conservatively assumes this decision is made 16 hours after the event. FSAR section 6.3.3.4.3.e assumes a minimum of 344,000 gallons of EFW is available during this time. This volume is met with the contents of the CSP and one WCT basin.

#### Use of the WCT Basins as the Primary EFW Supply

NUREG-0800, Section 10.4.9, "Auxiliary Feedwater System" was reviewed to determine the regulatory basis for use of the WCT basins as the primary EFW supply when the CSP is inoperable for more than four hours. No basis could be identified. The TS limiting condition for operation was modeled after NUREG-0212, Revision 3, "Combustion Engineering - Standard Technical Specifications", which



does identify that an alternate water source for EFW may be demonstrated operable when the CSP is inoperable for more than four hours. However, correspondence in 1983 between Louisiana Power & Light (LP&L) and the Waterford 3 architect-engineer, EBASCO, indicated LP&L's intention to delete this LCO from the W3 TS for the following reasons:

- Since the Auxiliary Component Cooling Water (ACCW) pumps do not start on an Emergency Feedwater Actuation Signal (EFAS), the ACCW pumps would have to run continuously while lined up to the CSP.
- The ACCW system could not provide sufficient flow rate to the Component Cooling Water (CCW) heat exchanger while also supplying EFW.
- Postulating a single failure, the water capacity in a WCT basin is insufficient to meet the requirements for both the Ultimate Heat Sink (UHS) and EFW system.
- For chemistry and steam generator tube integrity considerations, it is undesirable to use WCT basin water in the steam generators other than in emergency conditions.

This item was further discussed in correspondence between the utility and the AE; however, the documentation relating to resolution and approval of TS 3.7.1.3 cannot be located. Therefore, it cannot be identified why TS 3.7.1.3, Action (b) was allowed or why it was not removed. This concern over lining up the WCT basins as the primary source of EFW was documented in the Waterford 3 corrective action program as condition report CR-96-1441. It was also documented in NRC inspection report 96-12 as Notice of Violation (NOV) 9612-05. Administrative controls have been implemented to prohibit entry into TS 3.7.1.3, Action (b) until this issue is resolved.

CE Revised Standard TS states, "The CSP level must be returned to OPERABLE status within 7 days, as the backup supply may be performing this function in addition to its normal functions." This indicates that the WCT basins should be capable of performing their intended function(s) while concurrently supplying EFW. During a design basis LOCA, a WCT basin does not contain enough water supply to concurrently function as the sole source for EFW (as described in the current TS) and perform its heat removal capabilities for the UHS assuming a single failure of an ACCW pump or the EDG.

Thus the basis for allowing the WCT basin to be the primary source of water for EFW when the CSP is inoperable appears to be unsupported. Therefore, TS 3.7.1.3, Action (b) and its associated surveillance requirement are being deleted from the W3 TS.

A catastrophic failure of the CSP concurrent with an EFW system demand is not a credible scenario. However, Waterford 3 has evaluated the ramifications of having to

shutdown if the CSP were completely unavailable. Under this scenario, a WCT basin could be aligned as an alternate safety-related source of feedwater to compensate for the potential failure of the Main Feedwater system. Although the likelihood of this event is extremely remote, Waterford 3 has elected to incorporate administrative controls in its off-normal procedures to address this scenario.

### 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

As previously identified, the accidents for which the combined water inventory of the CSP and WCT basin is needed are tornado and natural circulation events. The combined inventory is also required during post-LOCA long term cooling until shutdown cooling is entered. CSP level is not a failure mode for any of these events. The contents of the CSP and one WCT basin are sufficient to meet plant needs for accident mitigation in each of these scenarios. Deletion of TS 3.7.1.3 Action (b) and the associated surveillance do not affect the volume of either the CSP or the WCT basin and will not affect the consequences of the accidents for which the CSP and a WCT basin are needed.

In addition, all accident analyses assume that EFW is initially aligned to the CSP. No credit is taken for an initial alignment to the WCT basins. Thus removal of this action will not impact any analysis.

As previously discussed, a catastrophic failure of the CSP concurrent with an EFW system demand is not a credible scenario. As a conservative measure, Waterford 3 has elected to incorporate administrative controls in its off-normal procedures to address this scenario.

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 CSP is used almost exclusively as the water supply for EFW. The only exceptions are its use as a makeup source for the CCW system, Emergency Diesel Generator Jacket Cooling Water System, Fuel Pool and Purification System, and Essential Chilled Water, which place a minimal demand on the pool. The possible failure modes that could keep the CSP from fulfilling its intended safety function as the only dedicated source of EFW are tank vent clogging, low tank level, and pump suction flashing.

The CSP is equipped with an 8 in. vent line which penetrates the pool ceiling and terminates in the above room six feet above the floor. There is no isolation valve on the line, and there are no known sources of debris in the area which could clog such a large diameter pipe. Also, the pipe ends with a "U"-bend, with the open end turned downwards. Accidental crimping of the thick walled pipe is not considered credible since the pipe is not within the travel path of any cranes, and is located in a congested area behind an instrument cabinet, out of the path of any fork lifts.

The CSP is equipped with redundant, safety grade level indicators and TS 3.7.1.3 requires operators to verify tank level is within allowable limits every 12 hours.

In addition, the CSP water remains at RAB ambient temperatures, usually below 90°. There are no lines from hot, interfacing systems which connect to the lines between the CSP and pump suction.

Therefore, the probability of these failure modes will not increase by the deletion of TS 3.7.1.3, Action (b). As such, it is not considered credible that tank level would be out of limits when a system demand occurred. Also, no new system connections or interactions are created by this change. Deletion of this TS action statement does not create a new or different accident with regard to the CSP.

An Emergency Feedwater Actuation Signal (EFAS) is initiated upon either a low steam generator level coincident with no low steam generator pressure or a low steam generator level coincident with high steam generator differential pressure to feed the steam generator with the highest pressure. CSP level does not affect initiation of an EFAS, therefore this proposed change does not create a new or different EFAS initiator.

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 will preserve the margin of safety. The CSP is unaffected by this change and will continue to perform its intended safety function as the water supply for EFW. The combined volumes of the CSP and one WCT basin are still available to perform their accident mitigation function. If the action statement for TS 3.7.1.3 is entered, the plant will have 4 hours to restore the CSP to an operable condition or begin to shutdown.

The WCT basins will continue to perform their intended safety function as the ultimate heat sink and the quantity of water available for that purpose is unaffected by this change. The WCT basins will still be available as an additional source for EFW during accident conditions; however, they will not be lined up as the primary source of EFW when the CSP is inoperable and they will not be credited to extend the allowed outage time for the CSP when the CSP is inoperable.

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.