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PR

September 16, 1993

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-38-142

Gentlemen:

The attached description and safety analysis support a change to the Waterford 3 Technical Specification TS 3/4.7.4 "Ultimate Heat Sink". NRC Inspection Report 50-382/93-07 dated May 4, 1993 discussed a problem with the specified requirements for the Wet Cooling Tower Fan Covers. This concern prompted a thorough review of the Ultimate Heat Sink Technical Specification which identified other problems. The changes described herein are necessary to resolve conflicts associated with this plant specific specification and provide clarification of existing requirements.

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

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Should you have any questions or comments concerning this request, please contact Paul Caropino at (504)739-6692.

Very truly yours,

R.P. Barkhurst
Vice President, Operations
Waterford 3

RPB/PLC/dc
Attachment: Affidavit
NPF-38-142

cc: J.L. Milhoan, NRC Region IV
D.L. Wigginton, 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

R.P. Barkhurst, 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-38-142; 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.

R.P. Barkhurst
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 16TH day of SEPTEMBER, 1993.

Steven E. Falgout
Notary Public

My Commission expires WITH LIFE.

DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-38-142

The following changes are proposed to correct and clarify the Waterford 3 "Ultimate Heat Sink" Technical Specification (TS) 3/4.7.4:

- The requirement associated with a single asterisk on Table 3.7-3 concerning fan covers has been revised.
- An editorial change was made to the requirement associated with two asterisks on Table 3.7-3.
- An editorial change was made to the requirement associated with three asterisks on Table 3.7-3.
- Three asterisks have been added to the first column on Table 3.7-3 next to "14 DCT" to ensure that all fans located under the missile protected portion of the DCT are operable during a Tornado Watch.
- Action "c" was clarified by adding the words "on one DCT/WCT train".
- Action "e" has been revised and Table 3.7-3 was modified to remove "and WET BULB < 76°F".
- A note has been added to Table 3.7-3 to ensure compliance with Action "f".
- Action "f" has been revised.
- The 7 day frequency of Surveillance Requirement 4.7.4 has been increased to 31 days.
- The Bases has been updated to provide more information.

Existing Specification

See Attachment A

Proposed Specification

See Attachment B

Background

Given the unique design of the Waterford 3 Ultimate Heat Sink (UHS), the following information is provided to aid in review of the proposed changes. The function of the UHS is to dissipate the heat removed from the reactor and its auxiliaries during normal unit operation, during refueling, or after a design basis accident.

The UHS consists of two forced draft dry cooling towers (DCTs), two mechanical draft wet cooling towers (WCTs), and water stored in the WCT basins. Each of two 100 percent capacity loops employs a dry and wet cooling tower. The dry towers are the primary heat sink for the Component Cooling Water System (CCWS) during normal operation and each DCT has been sized to dissipate to the atmosphere approximately 60% of heat removed by the CCWS after a LOCA assuming historically highest ambient dry bulb temperature (102°F). The heat removal capacity of the DCT varies significantly depending on the CCW temperature, dry bulb atmospheri temperature and heat removed by the Auxiliary Component Cooling Water System (ACCWS).

Each DCT consists of five separate cells, each cell contains two, 40 ft. long vertical cooling coils, arranged in a "V" shape. Cooling air for each cell is provided by three 40 horsepower fans, for a total of 15 fans per DCT. DCT fans are started and shutoff automatically to maintain the CCWS temperature at a predetermined setpoint.

The cooling coils on three cells of each DCT (i.e. 60%) are protected from tornado missiles by grating located above the coils and capable of withstanding tornado missile impact. DCT fans and motors are located below grade, and are protected from tornado missiles by building walls and/or access platforms.

The wet towers are designed to operate whenever the heat rejection capacity of the CCWS is exceeded. Each tower has a basin which is capable of storing sufficient water to bring the plant to safe shutdown under all accident conditions. Each WCT is sized to dissipate to the atmosphere approximately 40% of heat removed by the CCWS after a LOCA, assuming the historically highest ambient wet bulb temperature (83°F). The capacity of the wet cooling tower varies significantly, depending on the component cooling water temperature to be maintained and atmospheric wet bulb temperature.

Each WCT consists of two cells, each cell is serviced by four induced draft 30 horsepower fans, for a total of 8 fans per WCT. There is a concrete partition between each cell that prevents air recirculation between the fans of each

cell. The wet cooling tower fans are started automatically whenever the water temperature in the tower basin exceeds a predetermined setpoint, and shut off by the operator.

Wet cooling towers remove heat from the CCWS by the separate Auxiliary Component Cooling Water System (ACCWS). Unlike the DCTs, the forced air actually contacts ACCW during the heat removal process. The ACCWS takes water from the wet cooling tower basin, pumps it through the CCW heat exchanger where its temperature is raised, and then to the wet cooling tower for heat dissipation to the atmosphere. ACCW enters the WCT and is sprayed downward towards the basin into fill modules which separates the water into droplets. Air is drawn upward through the modules and spray area by the fans located on top of the tower.

Description

The UHS LCO (TS 3/4.7.4) requires wet and dry cooling tower fans to be operable as specified in Table 3.7-3. The table is divided into three columns which allow for reduced fan requirements at lower temperatures and humidity. Additional requirements are imposed by the use of asterisks which are defined on the bottom of the table.

The definition/requirement associated with a single asterisk has been revised to clarify the use of WCT fan covers. The note now states that covers must be in place on out-of-service fans or the entire cell declared out-of-service. Covers on out-of-service WCT fans are necessary to maintain cooling efficiency by preventing air recirculation. As stated earlier, the WCT fans draw air upward through the fill modules and spray area. With fan(s) not operating within a single cell, outside air would be drawn in through the out-of-service fan air discharge cone above the spray area, thus reducing the cells cooling efficiency. The existing requirement which simply requires covers on out-of-service fans was recently scrutinized by Operations and NRC personnel. NRC Inspection Report 93-07 describes an occurrence at Waterford 3 where WCT fans 1-4 on Train A, which are within the same cell, were taken out-of-service for preventative maintenance. However, covers were not placed on the out-of-service fans. When the subsequent operating crew prepared to place the fans back into service they were concerned because Train A had not been declared inoperable and the appropriate TS Action had not been entered. Further discussion revealed that TS Table 3.7-3 required 4 WCT fans to be operable, and the initial operating crew felt that since WCT fans 5-8 were available for operation while WCT fans 1-4 were out-of-service, Train A was still able to perform its' safety related function. Therefore, Technical Specification requirements were considered satisfied by Operations. However, based on verbatim compliance with TS Table 3.7-3 which requires covers on out-of-

service fans, Train A should have been declared inoperable. As a result Condition Report CR-93-029 was initiated. Corrective Action for CR-93-029 includes the subject TS change to clarify the requirements of TS 3.7.4.

Action "c" applies when the number of fans operable is less than that required by Table 3.7-3 on one train. To be consistent with Action "d" the words "on one DCT/WCT train" were added to Action "c".

Action "e" concerns 9 fans which are located under the missile protected (i.e. 60%) portion of a DCT and states "With one or more DCT fan(s) within the missile protected area of a DCT inoperable and if a Tornado Watch is in effect, restore the inoperable fan(s) to operable status within one hour...". This action conflicts with the requirement identified by two asterisks on Table 3.7-3; a provision which requires 8 of the 9 fans to be operable. To resolve this discrepancy Action "e" has been revised to refer to Table 3.7-3. In addition, an editorial change was made to the footnoted requirement on Table 3.7-3.

Three asterisks on Table 3.7-3 identifies a requirement to ensure that all fans under the missile protected portion of the DCTs are operable during a Tornado Watch. These asterisks have been added to the "14 DCT" fan requirement in the first column of the table. Under the specified ambient conditions only one fan (of the total 23 DCT and WCT fans) can be inoperable, however, all fans under the missile protected portion of the DCTs must be operable. In addition an editorial change was made to the footnoted requirement on Table 3.7-3.

Table 3.7-3 specifies different fan requirements based on outside ambient weather conditions. Realizing that weather conditions are subject to change, Action "f" requires periodic temperature verification when more than one fan is inoperable. The current TS is inadequate in that Action "f" may not be addressed if Table 3.7-3 is viewed as the only compliance factor. Therefore, a note was added to Table 3.7-3 below "Fan Requirements" to ensure compliance with Action "f".

Action "f" applies when more than one (total) DCT or WCT fan is inoperable. This has been clarified by removing "DCT or WCT". The time for determining outside temperature (which may include wet bulb) has been increased from one hour to two hours. This allows the operator ample time to perform the necessary actions/verifications. This time period is considered adequate with respect to safety based on the redundancy available. In addition, Action "f" has been revised to require 80°F as the initiating temperature for determining wet bulb temperatures. Wet bulb temperatures will normally be lower than dry

bulb and wet bulb is not a critical factor per Table 3.7-3 until dry bulb is ≥ 80°F. As stated earlier, atmospheric wet bulb temperature affects the capacity of the WCT. Since Table 3.7-3 requires the same amount of WCT fans at wet bulb temperatures less then 81°F, reference to wet bulb temperature in the third column has been removed.

Surveillance Requirement 4.7.4.b requires operating each WCT and DCT fan, that is not already running, once per 7 days for at least 15 minutes. Operating each cooling tower fan verifies that all fans are operable and that the associated controls are functioning properly. It also ensures that fan motor failure, or excessive vibration can be detected for corrective action. It is believed that the 7 day frequency was established to ensure fan vibration and random fan motor failure could be identified and corrected in a timely fashion. Over the past several years, a concerted effort has been made to identify and correct potential sources of vibration (i.e. vibration surveillances are performed on fan motors; when unacceptable vibration readings are obtained the unit is reworked to identify and correct the problem). These corrective measures have apparently been effective. Additionally, operating history for these motors suggests that with an effective preventative maintenance program such as that established at Waterford 3 random motor failure can be reduced to the point where any safety benefit gained from increased surveillance is compensated for by long term reliability. Therefore, the 7 day frequency is being increased to 31 days in an attempt to improve component reliability through reduced stress associated with testing. The 31 day frequency is based on operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the UHS cooling tower fans occurring between surveillances.

The UHS Bases Section 3/4.7.4 has been updated to provide additional information and clarification concerning the proposed changes discussed above.

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 changes will have no affect on any accident previously evaluated. All changes with the exception of the increased time in action "f", and the increased surveillance interval of 4.7.4.b, are editorial in nature or correct inconsistencies to meet the original intent of the TS. The changes to Action "f" will have no impact on initiating conditions or assumptions previously analyzed. Increasing the surveillance interval from 7 to 31 days is expected to enhance safety through improved reliability. Therefore, the proposed changes 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 changes will not alter the operation of the plant or the manner in which it is operated. The changes to Actions "c", "e", and Table 3.7-3 are being proposed to correct inconsistencies and provide clarification to the existing technical specification. The changes to Action "f" and 4.7.4.b will not create a new failure mode. 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 changes do not involve any changes to safety limits or limiting safety settings. The proposed changes are consistent with the Waterford 3 licensing bases for the UHS and will ensure continued availability to perform its design function. 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 10 CF 50.92; 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."

NPF-38-142

ATTACHMENT A