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May 8, 1991

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
Resolution of Generic Letter 90-06
Technical Specification Change Request NPF-38-115

Gentlemen:

On June 25, 1990, the Commission published the subject generic letter (GL). The GL addresses two issues related to pressurized water reactors: power-operated relief valve (PORV) and block valve reliability (Generic Issue 70), and additional low-temperature overpressure protection for light-water reactors (Generic Issue 94). Since Waterford 3 does not have PORVs and block valves, no further action is required to address the first issue. However, the GL requires technical specification changes to address the second issue. The request for these changes is required to be submitted by the end of the first refueling outage that starts after December 25, 1990. Under the present Waterford 3 schedule, this means on or before May 12, 1991.

This letter documents the amendment request to the technical specifications as required by GL 90-06. If there are any questions or comments on this, please direct them to T.J. Gaudet at (504) 739-6666.

Very truly yours,

RPB/DAR/ssf

Attachments: NPF-38-115
Affidavit

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of)

Entergy Operations, Incorporated)
Waterford 3 Steam Electric Station)

Docket No. 50-382

AFFIDAVIT

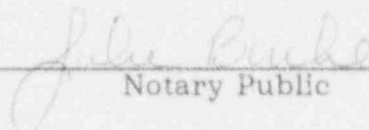
R.P. Barkhurst, being duly sworn, hereby deposes and says that he is Vice President Operations - Waterford 3 of Entergy Operations, Incorporated; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached Technical Specification Change Request NPF-38-115; that he 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 2 day of May, 1991.


Notary Public

My Commission expires at death.

DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-38-115

In accordance with Generic Letter (GL) 90-06, this safety analysis justifies revising Waterford 3 Technical Specification (TS) 3.4.8.3, Overpressure Protection Systems, to improve the availability of overpressure protection at low temperature.

Existing Specifications

See Attachment A

Proposed Specifications

See Attachment B

Description

GL 90-06 addresses two issues that affect the operation of pressurized water reactors. Generic Issue (GI) 70 concerns the reliability of power-operated relief valves (PORVs) and block valves. Since Waterford 3 does not have PORVs or block valves, no actions are necessary for resolution of this issue. The second issue, GI 94, concerns the provision of additional low-temperature overpressure protection (LTOP) for light-water reactors. Overpressurization of the Reactor Coolant System (RCS) at low temperature, if combined with a critical crack in the reactor pressure vessel welds or plate material, could result in a brittle fracture of the pressure vessel. This could hinder the ability to provide adequate coolant to the reactor core resulting in major core damage or a core melt accident. The staff has determined that LTOP System unavailability is the dominant contributor to risk of a low-temperature overpressure transient. Studies of industry events indicate that there are common factors that contribute to LTOP System unavailability. The GL identifies additional requirements to be added to TS 3.4.8.3, Overpressure Protection Systems, based on the results of these studies that reduce the potential for LTOP System unavailability. Sample text is provided with the GL for guidance. With few exceptions, this text was used verbatim in preparation of this amendment.

Changes to TS 3.4.8.3 are as follows:

1. APPLICABILITY of the LIMITING CONDITION FOR OPERATION (LCO) for MODE 6 has a restriction added. In addition to the existing requirement that the head be on the reactor vessel, the following is included for MODE 6:

". . . and the RCS is not vented through a 5.6 square inch or larger vent."

Depressurizing and venting the RCS are not classified as systems for overpressure protection. Therefore, the amended APPLICABILITY of the LCO excludes MODE 6 when the RCS is adequately vented. This avoids any possible question on Specification 3.0.4 being applied to preclude placement of the head on the vessel if any part of the LCO is not met when the RCS is vented. This change is in accordance with GL 90-06.

2. The APPLICABILITY for MODE 6 is clarified as "when the head is on the reactor vessel" rather than, "with the reactor vessel head on." This change is in accordance with GL 90-06.
3. ACTION a. is revised in accordance with GL 90-06 to clarify that it is only applicable in MODE 4.
4. ACTION b. was added to reduce the allowed outage time for an inoperable Shutdown Cooling (SDC) System suction line relief valve from seven days to twenty-four hours in MODES 5 or 6. This change is in accordance with GL 90-06.
5. Existing Surveillance 4.4.8.3.2 requires verification of the vent path when the vent is used for overpressure protection. The proposed surveillance is changed to identify the specific ACTION statements describing when this would apply (i.e., ACTIONS a, b, and c). Although the GL requires this verification in an ACTION statement, it is essentially a surveillance. Therefore, Waterford 3 chooses to retain this statement in the surveillance section. The content of the proposed surveillance is consistent with both the GL and the existing surveillance.
6. The existing LCO for 3.4.8.3 states that LTOP can be provided by:

". . . establishing less than 100°F delta-T between RCS and steam generator temperature or ensuring the pressurizer water volume is less than 900 cubic feet (62.5%), prior to starting any reactor coolant pump."

The APPLICABILITY for this TS is, "MODE 4 when the temperature of any RCS cold leg is less than or equal to 285°F, MODE 5, and MODE 6 with the reactor vessel head on." The deletion of this LCO from TS 3.4.8.3 is insignificant since this is covered by the LCOs for TS 3.4.1.3 (Hot Shutdown, APPLICABILITY: MODE 4, only) and 3.4.1.4 (Cold Shutdown - Loops Filled, APPLICABILITY: MODE 5 with reactor coolant loops filled). The text of these TSs states:

". . . a reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 285°F unless (1) the pressurizer water volume is less than 900 cubic feet or (2) the secondary water temperature of each steam generator is less than 100°F above each of the Reactor Coolant System cold leg temperatures."

TSs 3.4.1.3 and 3.4.1.4 are as or more conservative since the temperature difference between the steam generator and the cold leg will be greater than or equal to the difference between the RCS and the steam generators. As indicated, this requirement is adequately addressed by TS 3.4.1.3 for MODE 4. MODE 5 with the reactor coolant loops filled is covered by TS 3.4.1.4, since the average RCS temperature in MODE 5 is less than or equal to 200°F. The remaining applicable MODES of operation are MODE 5 with the reactor coolant loops partially filled and MODE 6. Under these conditions, pump restrictions are irrelevant since the reactor coolant pumps would never be started. Therefore, the restrictions on starting a reactor coolant pump in TS 3.4.8.3 are redundant to restrictions for 3.4.1.3 and 3.4.1.4, and can be deleted without consequence.

Certain aspects of the existing Waterford 3 LTOP TS differed from the sample text provided with the GL. Therefore, some differences exist between the GL sample text and the Waterford 3 proposed version. To retain the protection provided by the existing TS, the following was included in the amendment:

1. The sample LCO in Attachment B-1 of GL 90-06 addresses PORVs that provide overpressure protection. As stated, Waterford 3 does not use PORVs. Therefore, the proposed amendment addresses SDC System suction line relief valves. Likewise, the analog channel operation tests and channel calibrations included in the GL Surveillance Requirements are unnecessary since they concern PORVs.
2. Valve identification numbers are included in the LCO for the proposed amendment.
3. The values for three parameters in the LCO are defined by Waterford 3-specific safety analyses. These are (a) the pressure below which the relief valve lift set point should be defined (430 psia), (b) the RCS cold leg temperature below which the LCO is applicable for MODE 4 (285°F), and (c) the minimum area considered to be effective through which the RCS may be vented (5.6 square inches). These values are taken from the existing TS version.
4. Normally, the maximum temperature of the RCS cold leg for which the LCO is applicable in MODE 4 is 285°F. A footnote to Waterford 3 TS 2.4.8.3 APPLICABILITY (but not included in the GL sample text) identifies an exception to this as:

". . . [or] 260°F during inservice leak and hydrostatic testing with Reactor Coolant System temperature changes restricted in accordance with Specification 3.4.8.1g."

This was an amendment granted by the NRC on May 30, 1986, to allow compliance with TS requirements to establish the integrity of all ASME Code Class 1, 2 and 3 components.

5. The GL states that plants using only RHR safety relief valves for LTOP need no additional surveillance requirements beyond those required by TS 4.0.5. However, existing Waterford 3 surveillance, TS 4.1.8.3.1a., requires that:

"each SDC System suction line relief valve shall be demonstrated OPERABLE . . . by verifying that each valve in the suction path between the Reactor Cooling System and the shutdown cooling relief valve is open in the control room at least once per 12 hours."

This surveillance represents a restriction the GL does not address. To omit this from the proposed TS would make it less conservative.

W3P90-1914 described to the Commission the Waterford 3 planned implementation of Generic Letter 90-06. It pointed out that GL TS Surveillance 4.4.9.3 requires PORV operability to be demonstrated. As stated, Waterford 3 does not have PORVs; hence, operability of the SDC System suction line relief valves should be demonstrated. In accordance

with the surveillance proposed in the GL, W3P90-1914 stated that the frequency of the Waterford 3 surveillance would be at least every 72 hours. Clearly, the existing Waterford 3 TS is more restrictive since its frequency is every 12 hours. As such, the existing surveillance will be retained as an action statement (as previously identified) with some grammatical changes.

The text in the proposed version will be:

"Each SDC System suction line relief valve shall be demonstrated OPERABLE . . . by verifying in the control room at least once per 12 hours that each valve in the suction path between the RCS and the SDC relief valve is open."

6. An existing surveillance, 4.4.8.3.1b, is retained for the proposed TS that requires testing pursuant to Specification 4.0.5 to be performed at least every thirty months. Since this is not specifically addressed in the GL, the frequency would default to that consistent with 4.0.5 which is every thirty-six months. This is clearly not the intent of the generic letter, so the original surveillance frequency of thirty months is retained.
7. ACTION d., identified in the GL, includes requirements to verify that ACTIONS a., b., and c. continue to be met on an ongoing basis when the unit is in MODES 4, 5, or 6. The GL identifies this as an addition for those utilities that do not presently have such requirements in their TSs. As previously stated, an existing surveillance already addresses this for Waterford 3. Since this is essentially a surveillance, it is retained in the proposed TS as Surveillance 4.4.8.3.2.

GL 90-06 also addresses operational limitations established by the design basis assumptions for the LTOP System. A Branch Technical Position (RSB 5-2, "Overpressure Protection of Pressurized Water Reactors While Operating at Low Temperatures") identified the need for additional restrictions if the design base for LTOP was developed based on restricted safety injection pump operability and/or differential temperature restrictions for reactor coolant pump restart. These changes would add restrictions to the TSs on the number of operable charging and HPSI pumps allowed, and establish conditions necessary to allow the restart of a reactor coolant pump. GL 90-06 requires that these changes be made at this time, if appropriate.

Existing TS requirements for LTOP apply in MODE 4 when the temperature of any cold leg is below 285°F, MODE 5, and MODE 6 when the head is on the reactor vessel. During these conditions, one channel of the LTOP System is capable of mitigating a LTOP event that is bounded by the largest mass addition to the RCS or by the largest increase in RCS temperature that can occur. The largest mass addition to the RCS is limited based upon the assumption that no more than a fixed number of pumps are capable of providing makeup or injection to the RCS. At Waterford 3, each relief valve that provides overpressure protection of the RCS during low temperature conditions is sized for transients due to the simultaneous, inadvertent operation of all three high pressure safety injection (HPSI) pumps and all three charging pumps with the pressurizer backup heaters in operation. Since the maximum number of charging and HPSI pumps are already assumed in LTOP design, restricting the number of makeup or injection pumps in the TSs is unnecessary.

The largest temperature increase in the RCS that could result in a challenge to the LTOP System is dependent upon the differential temperature between the RCS and the secondary system when starting a reactor coolant pump. Hence, this is a matter important to safety when reactor coolant pumps are started and the

resulting RCS temperature increase is in excess of the design basis assumption for the LTOP System to mitigate the resulting RCS pressure increase. The GL suggests amending the TS, Reactor Coolant System, Hot Shutdown (this corresponds to Waterford 3 TS 3.4.1.3) and Cold Shutdown (Waterford 3 TS 3.4.1.4) with a footnote similar to the following:

"A reactor coolant pump shall not be started with one or more of the RCS cold leg temperatures less than or equal to 275°F unless the secondary water temperature of each steam generator is less than ____°F above each of the RCS cold leg temperatures."

As previously stated, Waterford 3 TS 3.4.1.3 has a similar restriction:

"A reactor coolant pump shall not be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 285°F unless (1) the pressurizer water volume is less than 900 cubic feet or (2) the secondary water temperature of each steam generator is less than 100°F above each of the Reactor Coolant System cold leg temperatures."

Branch Technical Position, RSB 5-2: Overpressurization Protection of Pressurized Water Reactors While Operating at Low Temperatures, states:

"A system should be designed and installed which will prevent exceeding . . . Appendix G limits for the reactor coolant system while operating at low temperatures."

The Bases for this TS state that the restrictions on starting a reactor coolant pump in MODES 4 and 5 with one or more RCS cold legs less than or equal to 285°F are provided to prevent RCS pressure transients (caused by energy additions from the secondary system) which could exceed the limits of Appendix G to 10 CFR Part 50. Analyses indicate the RCS will be protected against overpressure transients and will not exceed the limits of Appendix G, as long as reactor coolant pumps starts are restricted to (1) when the water volume in the pressurizer is below a defined limit, thereby providing a volume into which the primary coolant can expand, or (2) when the secondary water temperature of each steam generator is less than 100°F above each of the RCS cold leg temperatures. The first restriction, not mentioned in the GL, offers the same protection against overpressurization during reactor coolant pump restart as the second restriction. As shown, they both meet the intent of Branch Technical Position RSB 5-2. Consequently, the intended protection to assure LTOP exists and a TS amendment addressing pump restarts is unnecessary.

A change is made to the Bases for TS 3/4.4.8 indicating that the restrictions on starting a reactor coolant pump under these conditions are identified in TSs 3.4.1.3 and 3.4.1.4 (no longer in TS 3.4.8.3), and that it is for MODE 5 with the reactor coolant loops filled rather than just MODE 5.

The changes identified above provide either simplification, clarification, or additional restrictions on the operation of the Waterford 3 LTOP System. The intent is to improve availability of the LTOP System. The proposed amendment strictly adheres to the guidance and instruction provided in GL 90-06. All technical content of the safety analyses is unaffected. There will be no change to the physical design or operation of the plant. Based on the GL and this submittal, these changes have been accurately executed and will result in improved availability of the Waterford 3 LTOP System.

Safety Analysis

The proposed changes 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 the operation of the facility in accordance with these proposed changes involve a significant increase in the probability or consequence of any accident previously evaluated?

Response: No

During startup and shutdown conditions at low temperature without protection, particularly when water-solid, RCS pressure might exceed reactor vessel pressure-temperature limitations established for protection against brittle fracture. A major overpressurization transient at low temperature, if combined with a critical crack in the reactor pressure vessel welds or plate material could result in a brittle fracture of the pressure vessel. Failure of the pressure vessel could hinder the ability to provide adequate coolant to the reactor core resulting in major core damage or a core melt accident. The design based overpressurization case for LTOP is the simultaneous, inadvertent operation of all three charging and HPSI pumps with the pressurizer backup heater in operation at low temperature. Each LTOP relief valve is sized to provide sufficient overpressurization protection during such an accident.

Changes suggested by GL 90-06 and included in the proposed amendment either simplify and clarify TS 3.4.8.3 (Overpressure Protection Systems) or add additional TS restrictions for periods of degraded LTOP System performance. There is no change to the physical plant, to the operation of the plant, or to the existing safety analyses. The proposed changes improve LTOP System availability and do not change the safety-related function of the system or its operation. As such, the operation of Waterford 3 in accordance with these proposed changes does not increase the consequence of any accident previously evaluated.

The proposed TS changes are made in strict accordance with instructions provided in GL 90-06. As described above, these changes either simplify or clarify TSs (which do not change the intent of the TS) or add restrictions for periods of degraded LTOP performance. This corresponds to improved availability of overpressurization protection at low temperature. Additional information contained in the existing TS but not addressed by the GL is retained in the proposed amendment. This is compatible with the intent of the GL. By retaining this in the amendment, existing protection is not compromised. The net effect is improved availability of LTOP.

This amendment meets the objective of the GL by proposing TS changes to improve availability of the LTOP System during vulnerable periods of operation. Improved availability of the LTOP System corresponds to a decreased probability of an accident involving the loss of LTOP. The probability of all other accidents remains unaffected by the proposed amendment. Therefore, operation of Waterford 3 in accordance with these proposed changes does not increase the probability of any accident previously evaluated.

2. Will the operation of the facility in accordance with these proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

A new kind of failure path would have to be introduced by these proposed changes to introduce a new or different kind of accident from those already analyzed. As previously identified, most of these changes merely provide clarification, simplification, or more conservative restrictions. Operation of the plant will remain unaltered. There are no plant design modifications necessary to implement these changes. Consequently, a new failure path cannot exist as a result of the proposed amendment. Since the only resulting change is an improvement in LTOP availability, the current plant safety analyses remain complete and accurate in addressing licensing basis events and analyzing plant response. Therefore, the proposed amendment cannot create the possibility of a new and different kind of accident than previously evaluated.

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

Response: No

Each LTOP relief valve has been sized for transients due to simultaneous, inadvertent operation of all three HPSI pumps and all three charging pumps with the pressurizer backup heater in operation. Since the safety injection actuation signal starts only two HPSI pumps, a 20% design margin is recognized for each relief valve. The proposed amendment does not affect any of these design related issues or the performance of the system. All technical content of the safety analyses will be preserved. There will be no change to the physical design or operation of the plant. Consequently, operation of Waterford 3 in accordance with these proposed changes does not involve a significant reduction in the margin of safety.

The Commission has provided guidance concerning the application of standards for determining whether a significant hazards consideration exists by providing certain examples (48 FR 14870) of amendments that are considered not likely to involve significant hazards considerations. Each change identified in this proposal falls under one of the following examples:

- (i) A purely administrative change to technical specification; for example, a change to achieve consistency throughout the technical specifications, correction of an error, or a change in nomenclature.
- (vii) A change to make a license conform to changes in the regulations, where the license change results in very minor changes to facility operations clearly in keeping with the regulations.

This proposal most closely resembles example (vii) since the changes conform with GL 90-06 to support the resolution of GI 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors," with the exception of one item. This is the deletion from the LCO of the alternative means of providing LTCP by:

"... establishing less than 100°F delta-T between RCS and steam generator temperature or ensuring the pressurizer water volume is less than 900 cubic feet (62.5%), prior to starting any reactor coolant pump."

Since this is redundant to other existing TSs, its removal from the LCO is a line-item change and purely administrative in nature. As such, it closely resembles example (i).

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 CFR 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.