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September 11, 1998

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-38-210

Gentlemen:

The attached description and safety analysis support a change to the Waterford 3 Technical Specifications (TS). The proposed change modifies the Notes in Table 2.2-1 (Reactor Protective Instrumentation Trip Setpoints Limits) and Table 3.3-1 (Reactor Protective Instrumentation). A Bases change is being proposed to support this change.

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.

For the current plant status (Mode 1 operation), this change does not meet the criteria for exigent or emergency review. However, if the plant status were to change significantly, the emergency criteria would be applicable as this change would be required for plant startup. The Reactor Protective System as designed and built is physically not capable of meeting the required TS 2.2.1 and 3.3.1 Logarithmic Power Level-High, Local Power Density, Departure from Nucleate Boiling Ratio, and Core Protection Calculator bypass removal setpoint simultaneously. Therefore, all four channels of operating bypass removal would not be operable during a reactor startup from the next reactor shutdown or a reactor shutdown if the reactor were not tripped before reaching 10^{-4} % power. Entergy Operations requests the effective date for this change be upon receipt.

A001

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

Very truly yours,

C.M. Dugger
Vice President, Operations
Waterford 3

CMD/CWT/
Attachments: Affidavit
NPF-38-210

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) Docket No. 50-382
Waterford 3 Steam Electric Station)

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-38-210; 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 11th day of September, 1998.

Notary Public

My Commission expires at death.

DESCRIPTION AND NO SIGNIFICANT HAZARDS EVALUATION OF PROPOSED CHANGE NPF-38-210

The proposed change modifies Notes "1" and "5" of Table 2.2.1 and Notes "a" and "c" of Table 3.3-1 to reference the 10^{-4} % Bistable by name rather than by setpoint value. Changes are being made to the Bases to describe the setpoint value.

Existing Specification

See Attachment A

Proposed Specification

See Attachment B

Background

The Reactor Protective System (RPS) consists of sensors, calculators, logic, and other equipment necessary to monitor selected Nuclear Steam Supply System (NSSS) and containment conditions and to effect reliable and rapid Control Element Assembly (CEA) insertion (reactor trip) if any or a combination of the monitored conditions approach specified safety system settings. The system's functions are to protect the core and Reactor Coolant System (RCS) pressure boundary for defined anticipated operational occurrences (AOOs) and also to provide assistance in limiting the consequences for certain postulated accidents. Four measurement channels with electrical and physical separation are provided for each parameter used in the direct generation of trip signals, with the exception of CEA position. A two-out-of-four coincidence of like trip signals is required to generate a reactor trip signal. The fourth channel is provided as an installed spare and allows bypassing of one channel while maintaining a two-out-of-three system. Manual reactor trip is also provided.

Some reactor trip signals are provided with bypasses that are required to allow reactor startup. The High Logarithmic Power (HLP) trip, the Core Protection Calculators (CPC) generated High Local Power Density (LPD) and Low Departure from Nucleate Boiling Ratio (DNBR) trips, and the RCS Low Flow trip are bypassed at prescribed power levels since these trips would generate an unnecessary trip signal during reactor startup and power increase.

Description and Safety Considerations

The Notes in Table 2.2.1 and Table 3.3-1 are being changed. Specifically, the proposed change modifies Notes "1" and "5" of Table 2.2.1 and Note "a" and "c" of Table 3.3-1 to reference the 10^{-4} % Bistable by name rather than the setpoint at which the bypass is automatically removed. A Bases change is being added to describe the setpoint value.

The high logarithmic power level trip is provided to trip the reactor when indicated neutron flux power reaches a preset value. The flux signal used is the logarithmic power signal originating from the excore detectors in each nuclear instrument safety channel. The nominal trip setpoint is $\leq$ 0.257 % of full power. This trip provides protection against inadvertent CEA withdrawals initiated from subcritical conditions (less than 10^{-4} % power) as described in FSAR Section 15.4.1.1. The high logarithmic power level bypass is provided to allow reactor power to be increased above 0.257 % power into Mode 1 during a controlled reactor startup. Without the bypass in place, a reactor trip is generated when the trip setpoint is reached, thereby preventing further power increases. The bypass may be manually inserted above 10^{-4} % power and is automatically removed when the 10^{-4} % Bistable is reset at a power below 10^{-4} %. For example, when power increases during a reactor startup to the 10^{-4} % Bistable setpoint, a permissive signal is generated to allow the operator to bypass the HLP trip function. The manual bypass by the operator will occur only during a controlled power increase and not if the increase is due to an inadvertent CEA withdrawal. When power decreases to the 10^{-4} % Bistable reset value, the bypass is automatically removed. The automatic bypass removal ensures that the trip will be available in the event of a CEA withdrawal from subcritical conditions (below 10^{-4} % power).

Additionally, safety analyses described in FSAR section 15.4.1.2 assume that a CEA withdrawal from critical conditions can be initiated from the lowest power level (the most limiting initial condition) at which the HLP trip is not available. In this case, since the HLP trip is not available, a reactor trip is generated by the CPC variable overpower trip function. The initial power level could theoretically be just above the 10^{-4} % Bistable reset value during a shutdown if the power decrease were stopped at this power level which is highly improbable. Furthermore, since Waterford 3 procedurally trips the reactor between 5% – 10% power during a shutdown, it is extremely unlikely that this condition would occur.

The CPC provides reactor trips on DNBR and LPD when core power is above 10^{-4} %. The CPC also generates a reactor trip signal when RCS conditions are outside the range for which CPC is applicable (e.g., all RCPs not running, shutdown CEA banks not fully withdrawn, etc.). The CPC bypass, which bypasses the low DNBR and LPD trips, is provided to allow reactor trip breakers to be closed in preparation for reactor startup before all of the CPC range checks are met. If these range checks are not met, the CPC generates a reactor trip, thereby preventing CEA withdrawal and reactor startup. Safety analyses credit a CPC trip at the 10^{-4} % Bistable setpoint when conditions do not meet the CPC range checks (e.g., shutdown bank withdrawal). The bypass may be manually inserted if power is below 10^{-4} % and is automatically removed when the power level increases to the 10^{-4} % Bistable setpoint. For example, when power increases during a reactor startup to the 10^{-4} % Bistable setpoint, the CPC bypass is automatically removed. This ensures that the CPC is available under conditions where LPD and DNBR are of concern. If conditions do not meet the CPC range limits, as in the case of a CEA shutdown bank not fully withdrawn, a reactor trip is immediately generated. When power decreases to the 10^{-4} % Bistable reset value, as after a reactor trip, a permissive signal is generated to allow the operator to bypass the CPCs.

The bypass permissive function and automatic bypass removal function are reflected in notes "1" and "5" of Table 2.2.1 and notes "a" and "c" of Table 3.3-1. The setpoint for both the CPC and HLP functions is given as 10^{-4} % of RATED THERMAL POWER. However, a single bistable is used to initiate both the permissive and automatic bypass removal for both the CPC and HLP trip functions. A single bistable cannot both energize and de-energize at the same value as required by the Technical Specifications (TS) due to hysteresis. The CPC automatic bypass removal and permissive for the HLP trip bypass occur at the bistable setpoint (nominally 10^{-4} % power). However, the HLP automatic bypass removal and permissive for CPC trip bypass occur at the reset value of the bistable, which is slightly below 10^{-4} % power (7.94×10^{-5} % power). Thus, literal compliance with the TS which requires both to occur at 10^{-4} % power is not possible.

If the bistable is set so that the High Log Power automatic trip bypass removal occurs at 10^{-4} % power, the CPC automatic trip bypass removal will be slightly above the required 10^{-4} % power TS value. If the bistable is set so that the CPC automatic trip bypass removal occurs at 10^{-4} % power, the High Log Power automatic trip bypass removal will be slightly below the required 10^{-4} % power TS value. Waterford 3 procedures follow the latter case with the CPC automatic trip bypass removal set at 10^{-4} % power.

The same 10^{-4} % Bistable is used to automatically remove the bypass for the RCS Low Flow trip. This trip is used for a RCP sheared shaft event from Mode 1 operation. The problem discussed above, resulting from hysteresis in the bistable, has no impact on the analysis that credits this trip.

No Significant Hazards Evaluation

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 modify the table notations for the 10^{-4} % Bistable in TS 2.2.1 and 3.3.1. The proposed changes to these trip bypass removal functions do not adversely impact any system, structure, or component design or operation in a manner that would result in a change in the frequency or occurrence of accident initiation. The reactor trip bypass removal functions are not accident initiators. System connections and the trip setpoints themselves are not affected by trip bypass removal setpoint variations.

   Since the hysteresis for the 10^{-4} % Bistable is small, there is a negligible impact on the CEA withdrawal analyses. Revised analyses, accounting for slightly different bypass removal power levels caused by the bistable hysteresis, would result in negligible changes to the calculated peak power and heat flux for the pertinent CEA withdrawal events. Therefore, the consequences of any accident previously evaluated will not significantly change.

   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 trip bypass removal functions in question protect against possible reactivity events. The power, criticality levels, and possible bank withdrawals associated with these trip functions have already been evaluated. Therefore, all pertinent reactivity events have previously been considered. Slight differences in the power level at which the automatic trip bypass removal occurs can not cause a different kind of accident.

There has been no changes to any plant system, structure, or component, nor will these changes reduce the ability of any of the safety-related equipment required to mitigate AOOs.

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 safety function associated with the CPC and HLP trip functions are maintained. Since the hysteresis for the 10^{-4} % Bistable is small, there is a negligible impact on the CEA withdrawal analyses. Calculated peak power and heat flux are not significantly changed as a result of the bistable hysteresis. All acceptance criteria are still met for these events. There is no change to any margin of safety as a result of this change.

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

Safety and Significant Hazards Determination

Based on the above No Significant Hazards Evaluation, 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.