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W3F1-2009-0045

October 22, 2009

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: License Amendment Request to Modify Technical Specification Information for Table 2.2-1 and Table 3.3-1
Waterford Steam Electric Station, Unit 3
Docket No. 50-382
License No. NPF-38

REFERENCES: 1. NRC ISSUANCE OF AMENDMENT NO. 145 (ADAMS Accession No. ML0217904720)

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Operations, Inc. (Entergy) hereby requests the following amendment for Waterford Steam Electric Station, Unit 3 (Waterford 3). The proposed change will modify the Technical Specifications (TS) Table 2.2-1 and Table 3.3-1.

This TS change is intended to clarify TS Table 2.2-1 Notes “1” and “5”, TS Table 3.3-1 Notes “a” and “c”, TS Table 3.3-1 Action 2, and TS Table 3.3-1 Action 3 which have resulted in Plant Protection System (PPS) redundancy issues with respect to verbatim compliance. Waterford 3 had previously attempted to clarify TS Table 2.2-1 and Table 3.3-1 and received approval under Nuclear Regulatory Commission (NRC) issuance of Waterford 3 Amendment No. 145 (Reference 1). Amendment 145 did provide clarification of the logarithmic power use and the bistable reset but the complexity of the TS verbiage has still lead to verbatim compliance issues.

The proposed change has been evaluated in accordance with 10 CFR 50.91(a)(1) using the criteria in 10 CFR 50.92(c), and it has been determined that the changes involve no significant hazards consideration. The bases for these determinations are included in the attached submittal.

The proposed change does not include any new commitments.

A001
NRR

If you have any questions or require additional information, please contact Robert J. Murillo at 504-739-6715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 22, 2009.

Sincerely,

JAK/RJM/WJS

Attachments:
1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)
3. Proposed Technical Specification Bases Changes (mark-up) – For Information

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Attachment 1

W3F1-2009-0045

Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This letter is a request to amend Operating License No. NPF-38 for Waterford Steam Electric Station, Unit 3 (Waterford 3).

This Technical Specification (TS) change is intended to clarify TS Table 2.2-1 Notes "1" and "5", TS Table 3.3-1 Notes "a" and "c", TS Table 3.3-1 Action 2, and TS Table 3.3-1 Action 3 which have resulted in a reduction in Plant Protection System (PPS) redundancy due to a verbatim compliance issue. The Combustion Engineering Standard Technical Specification (TS) (Reference 7.1) and Technical Specification Task Force (TSTF) Traveler 324 (Reference 7.2) both provide guidance that was referenced in this change. Waterford 3 had previously attempted to clarify TS Table 2.2-1 and Table 3.3-1 and received approval under Nuclear Regulatory Commission (NRC) issuance of Waterford 3 Amendment No. 145 (Reference 7.3). Amendment 145 did provide clarification of the logarithmic power use and the bistable reset but the complexity of the TS verbiage has still lead to verbatim compliance issues.

The Combustion Engineering Standard Technical Specification does provide clarification of TS Table 2.2-1 Notes "1" and "5" and TS Table 3.3-1 Notes "a" and "c" but verbatim compliance issues could still exist with this wording. The Combustion Engineering Standard Technical Specification recommendation has been modified to provide a simpler and more straight forward TS. Additional information is being added to the TS Bases to provide further enhancement.

2.0 PROPOSED CHANGE

The proposed change will modify TS Table 2.2-1 Notes "1" and "5", TS Table 3.3-1 Notes "a" and "c", TS Table 3.3-1 Action 2, and TS Table 3.3-1 Action 3 as shown in Attachment 2.

3.0 BACKGROUND

In August 2009, a NRC inspector informed Waterford 3 personnel the station was not in literal compliance with Technical Specification (TS) Table 3.3-1 Note "c". The NRC inspector concern is verbatim TS compliance with respect to whether the function that automatically removes the manual bypass described in TS Table 3.3-1 Note c is met considering Logarithmic Power Channel B was declared inoperable during startup after Hurricane Gustav in September, 2008. The logarithmic power channels provide inputs to actuate the automatic removal of bypasses for Core Protection Calculators (CPC), Reactor Coolant System (RCS) Flow, Departure from Nucleate Boiling Ratio (DNBR), and Local Power Density (LPD) trips.

On August 22, 2009, Waterford 3 placed the Channel B RCS Flow, DNBR, and LPD bistables in bypass. This approach was taken in order to fully evaluate

OPERABILITY and TS compliance. Placing Channel B RCS Flow, DNBR, and LPD bistables in bypass lowers the operational safety margin by changing the trip logic from a 2 out 4 to a 2 out of 3 scenario. For Technical Specification surveillances which require the plant protection system to be placed in bypass, this would required the TS Table 3.3-1 Action 3 to be met. This would require CPC Channel B to be placed in trip while the other CPC channel was in bypass. This will cause the Equipment Out of Service (EOOS) plant safety index to be lowered and would place the plant in a 1 out of 2 trip scenario. The plant safety index is calculated based upon the Core Damage Frequency (CDF) associated with the selected equipment out of service.

On August 28, 2009, logarithmic power channel B was determined to be OPERABLE but DEGRADED. This conclusion was reached based upon further engineering evaluation of the logarithmic power channel B data and functionality. The revised operability determination followed the NRC Regulatory Issue Summary (RIS) 2005-20 Revision 1 (Reference 7.6) guidance. This allowed the Channel B RCS Flow, DNBR, and LPD bistables to be taken out of bypass and this channel of redundancy was restored.

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 operating bypasses that are required to allow reactor startup. The High Logarithmic Power (HLP), High Local Power Density (LPD), Low Departure from Nucleate Boiling Ratio (DNBR), and Low Reactor Coolant System Flow trips are bypassed at prescribed power levels since these trips would generate an unnecessary trip signal during reactor startup and power increase.

4.0 TECHNICAL ANALYSIS

The TS Table 2.2-1 Notes "1" and "5", TS Table 3.3-1 Notes "a" and "c", TS Table 3.3-1 Action 2, and TS Table 3.3-1 Action 3 are being modified to provide a simpler and more straight forward TS.

4.1 10^{-4}% Bistable Safety Function

The TS Table 2.2-1 Notes "1" and "5" and TS Table 3.3-1 Notes "a" and "c" are updated to provide a simpler and more straight forward TS.

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 (Reference 7.4). This trip provides protection against inadvertent CEA withdrawals initiated from subcritical conditions (less than 10^{-4}% logarithmic power) as described in FSAR Section 15.4.1.1 (Reference 7.5). The high logarithmic power level operating bypass is provided to allow reactor power to be increased above 0.257% power into Mode 1 during a controlled reactor startup. Without the operating bypass in place a reactor trip is generated when the trip setpoint is reached, thereby preventing further power increases. The operating bypass may be manually inserted above the 10^{-4}% bistable setpoint and is automatically removed when the 10^{-4}% bistable is reset. 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 high logarithmic power 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.

Additionally, safety analyses described in FSAR section 15.4.1.2 (Reference 7.5) 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's standard practice is to trip 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 the 10^{-4}% bistable setpoint. 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 high 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 operating bypass may be manually enabled if power is below 10^{-4}% bistable setpoint 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 signal 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.

4.2 TS Table 3.3-1 Action 2 and 3

TS Table 3.3-1 Action 2 and 3 are being updated to demonstrate that the logarithmic power channel affects multiple functional units. The logarithmic power channel provides the signal to the 10^{-4}% bistable for the operating bypass automatic removal function. With the operating bypasses enabled, the accident analyses credit the automatic removal function of the 10^{-4}% bistable. So with the operating bypasses enabled, the logarithmic power channel affects the HLP, LPD, DNBR, and RCS Flow trips. The Table 3.3-1 Action 2 and 3 lists the channel process measurement circuits which affect multiple functional units while inoperable or in test. The logarithmic power channel affects multiple functional units and should have been included in this list. This change is a human factor enhancment in that it provides the necessary information to alleviate the logarithmic power channel potential impact miss associated with LPD, DNBR, and RCS Flow trips.

With the operating bypass removed, the accident analyses assumptions are met because the LPD, DNBR, and RCS Flow trips would be available to perform their intended safety function. The startup procedure verifies that the operating bypasses are removed and the LPD, DNBR, and RCS Flow trips are available. Board walkdowns also verify the operating bypasses are in the correct position. Multiple verifications are present to ensure the operating bypasses are removed so the defense in depth is maintained for crediting these actions.

4.3 TSTF-324 Revision 1 Information

The primary intent of the proposed change is to reflect TSTF-324 which was approved by the NRC with the stated purpose:

"Footnotes associated with Table 3.3.1-1 that identify operating bypass permissive and trip enable requirements contain wording that results in confusion with verbatim compliance. For example, footnote (a) requires the bypass to be automatically removed when THERMAL POWER is </=[1E-4]% RTP. If the bypass is manually removed prior to the automatic removal, is verbatim compliance met? More properly, the footnote should allow the bypass to be instituted and capable of automatic removal when above [1E-4]%, for this specific footnote. This will ensure that the bypass automatic removal capability is available while allowing the operator to manually enable the trip function as plant conditions allow. The footnotes also discuss "trip" and "bypass" one after the other. This existing wording is not human factored as it requires a change in thought process. The proposed wording presents a more consistent approach, from the human factors standpoint, by discussing this feature in the terms of the bypass status only."

Consistent with TSTF-324 the proposed change does not impact the method by which the associated equipment performs the required function. The change rewords the TS notes to remove potential confusion concerning the acceptability of manually enabling the associated trip functions. As demonstrated by the discussion, the intent of the wording change was to prevent confusion concerning the intent of the requirement and did not change the requirement.

Additionally, the plant specific bases are proposed to explain the specific Waterford 3 design. The proposed change does not change the requirements for equipment OPERABILITY and is a presentation change of the requirements only.

4.4 TS Amendment 145 Information

TS Amendment 145 (Reference 7.3) approved the bistable information with respect to the hysteresis affects and the logarithmic power clarification.

The operating bypasses are provided to permit testing, startup, and maintenance and are described in UFSAR Section 7.2.1.1.5 (Bypasses). The operating bypass permissive function and automatic bypass removal function are reflected in TS Table 2.2-1 notes "1" and "5" of and TS Table 3.3-1 notes "a" and "c". The setpoint for both the CPC and HLP operating bypass automatic functions is the logarithmic power 10^{-4}% bistable. 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 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. The demonstrated hysteresis is within 1.5% of a 0-10 volt range, which is within 3.0×10^{-5}% of the 10^{-4}% Bistable setpoint. Therefore, the reset value will be within a power of $3.0x10^{-5}$% below the bistable setpoint value. Thus, the logarithmic 10^{-4}% bistable is not able to actuate and reset at the same power. The bistable deadband information will be added to the TS Basis to clarify the bistable setpoint is a nominal value and is subject to a hysteresis affect.

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 Technical Specification 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 Technical Specification value. Waterford 3 procedures follow the latter case with the CPC automatic trip bypass removal set at 10^{-4} % power.

In addition to the above, this change will continue to specify that the setpoints for the 10^{-4} % Bistable are based upon output from the logarithmic power channels of the excore nuclear instrumentation. This indication for reactor power does not include decay heat produced by the core.

The current Waterford 3 Technical Specifications 2.2.1 and 3.3.1 use the terms THERMAL POWER and RATED THERMAL POWER to specify the setpoints of the 10^{-4} % Bistable. THERMAL POWER and RATED THERMAL POWER are defined in Technical Specifications 1.34 and 1.24 in terms of the total amount of heat transferred from the core to the reactor coolant system. This includes a contribution from decay heat produced by the core. As indicated by the associated Note (1) in the current TS, the requirement is to measure the power level as indicated by the logarithmic power channel. The proposed change is a presentation change to follow the Combustion Engineering Standard TS in the presentation that the parameter of interest is the power level as indicated by the logarithmic power channel.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory Requirements/Criteria

The proposed change has been evaluated to determine whether applicable regulations and requirements continue to be met.

10 CFR 50.36 states "A Limiting Safety System Setting is the setting for automatic protective devices related to those variables having significant safety functions. Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded."

General Design Criteria (GDC) 10, Reactor Design, requires that specified fuel design limits are not exceeded during steady state operation, normal operational transients, and anticipated operational occurrences (AOOs).

The Logarithmic Power Level, Core Protection Calculators (CPC), Reactor Coolant System (RCS) Flow, Departure from Nucleate Boiling Ratio (DNBR), and Local Power Density (LPD) trip setpoints are not affected by this change. The trip bypass and removal specified functions remain unchanged and continue to protect the accident analyses.

The Combustion Engineering Standard Technical Specification (TS) (Reference 7.1) and Technical Specification Task Force (TSTF) Traveler 324 (Reference 7.2) both provide the clarifying words that are referenced in this change. Waterford 3 had previously attempted to clarify TS Table 2.2-1 and Table 3.3-1 and received approval under Nuclear Regulatory Commission (NRC) issuance of Waterford 3 Amendment No. 145 (Reference 7.3). Amendment 145 did provide clarification of the logarithmic power use and the bistable reset but the complexity of the TS verbiage has still lead to verbatim compliance issues.

Based on these considerations, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will continue to be conducted in accordance with the site licensing basis, and (3) the approval of the proposed change will not be inimical to the common defense and security or the health and safety of the public.

In conclusion, Waterford 3 has determined that the proposed change does not require any exemptions or relief from regulatory requirements, other than the proposed TS change, and does not affect conformance with any GDC described in the Final Safety Analysis Report (FSAR).

5.2 No Significant Hazards Consideration

Waterford 3 has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the 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 Technical Specifications (TS) TS Table 2.2-1 Notes "1" and "5", TS Table 3.3-1 Notes "a" and "c", TS Table 3.3-1 Action 2, and TS Table 3.3-1 Action 3. 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.

   As previously approved in TS Amendment 145 (Reference 7.3), 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.

   With respect to the clarification proposed for the THERMAL POWER input to the bypass capability of the affected reactor trips for the 10^{-4} % Bistable, the proposed change does not alter the manner of operation of the operating bypasses and automatic bypass removals. This change corrects a discrepancy between the formal definition of this terminology and its use in the context of the applicable Technical Specifications.

   Therefore, the proposed change will not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind 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.

The proposed changes to TS Table 2.2-1 Notes "1" and "5", TS Table 3.3-1 Notes "a" and "c", TS Table 3.3-1 Action 2, and TS Table 3.3-1 Action 3 do not alter any plant system, structure, or component. Furthermore, these changes do not reduce the capability of any safety-related equipment to mitigate AOOs.

In addition, no new or different accidents result from proposed clarifications to the operating bypasses and automatic bypass removals of the affected reactor trips. The results of previously performed accident analyses remain valid. Therefore, this change does not create the possibility of a new or different kind of accident.

3. Does the 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.

Clarification of the THERMAL POWER input to the operating bypasses and automatic bypass removals of the 10^{-4} % Bistable does not alter the operation of the operating bypasses and automatic bypass removals of the affected reactor trips. This change corrects a discrepancy between the formal definition of this terminology and its use in the context of the applicable Technical Specifications. Therefore, the proposed change will not involve a significant reduction in a margin of safety.

5.3 <u>Environmental Considerations</u>

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 PRECEDENCE

The Combustion Engineering Standard Technical Specification (TS) (Reference 7.1) and Technical Specification Task Force (TSTF) Traveler 324 (Reference 7.2) both provide the clarifying words that are referenced in this change.

Prior to TSTF-324 being completed, Waterford 3 had requested and received approval under Nuclear Regulatory Commission (NRC) issuance of Waterford 3 Amendment No. 145 (Reference 7.3) to clarify TS Table 2.2-1 and Table 3.3-1. Amendment 145 did provide clarification of the logarithmic power use and the bistable reset but did not provide all the clarifications included in TSTF-324.

7.0 REFERENCES

7.1 NUREG-1432 Revision 3, Standard Technical Specifications Combustion Engineering Plants (ADAMS Accession No. ML062620039).
7.2 Technical Specification Task Force (TSTF) Traveler 324 Revision 1, Correct Logarithmic Power vs RTP (ADAMS Accession No. ML0406300600).
7.3 NRC ISSUANCE OF AMENDMENT NO. 145 (ADAMS Accession No.ML0217904720)
7.4 Waterford 3 Technical Specifications
7.5 Waterford 3 Updated Final Safety Analysis Report
7.6 NRC Regulatory Issue Summary (RIS) 2005-20 Revision 1

Attachment 2

W3F1-2009-0045

Proposed Technical Specification Changes (mark-up)

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

TABLE NOTATIONS

Replace with Insert A

(1) Trip may be manually bypassed above 10^{-4}% of RATED THERMAL POWER*; bypass shall be automatically removed when THERMAL POWER* is less than or equal to the reset point of the bistable. The reset point shall be within 3.0×10^{-5} % of RATED THERMAL POWER* below the bistable setpoint which is nominally 10^{-4}% of RATED THERMAL POWER*. This accounts for the deadband of the bistable.

(2) Value may be decreased manually, to a minimum of 100 psia, as pressurizer pressure is reduced, provided the margin between the pressurizer pressure and this value is maintained at less than or equal to 400 psi; the setpoint shall be increased automatically as pressurizer pressure is increased until the trip setpoint is reached. Trip may be manually bypassed below 400 psia; bypass shall be automatically removed whenever pressurizer pressure is greater than or equal to 500 psia.

(3) Value may be decreased manually as steam generator pressure is reduced, provided the margin between the steam generator pressure and this value is maintained at less than or equal to 200 psi; the setpoint shall be increased automatically as steam generator pressure is increased until the trip setpoint is reached.

(4) % of the distance between steam generator upper and low level instrument nozzles.

Replace with Insert B

(5) As stored within the Core Protection Calculator (CPC). Calculation of the trip setpoint includes measurement, calculational and processor uncertainties, and dynamic allowances. Trip may be manually bypassed below 10^{-4}% of RATED THERMAL POWER*; bypass shall be automatically removed when THERMAL POWER* is greater than or equal to 10^{-4}% of RATED THERMAL POWER*.

(6) As measured by the Logarithmic Power Channels.

(7) The setpoint may be altered to disable trip function during testing pursuant to Specification 3.10.3.

~~*As measured by the Logarithmic Power Channels.~~ Delete

TABLE 3.3-1 (Continued)

TABLE NOTATION

*With the protective system trip breakers in the closed position, the CEA drive system capable of CEA withdrawal, and fuel in the reactor vessel.

#The provisions of Specification 3.0.4 are not applicable.

a logarithmic power of

**Not applicable above 10^{-4}% RATED THERMAL POWER(1) Delete

Replace with Insert A

(a) Trip may be manually bypassed above 10^{-4}% of RATED THERMAL POWER(1); bypass shall be automatically removed when THERMAL POWER(1) is less than or equal to the reset point of the bistable. The reset point shall be within 3.0×10^{-5}% of RATED THERMAL POWER(1) below the bistable setpoint which is nominally 10^{-4}% of RATED THERMAL POWER(1). This accounts for the deadband of the bistable.

(b) Trip may be manually bypassed below 400 psia; bypass shall be automatically removed whenever pressurizer pressure is greater than or equal to 500 psia.

Replace with Insert B

(c) Trip may be manually bypassed below 10^{-4}% of RATED THERMAL POWER(1); bypass shall be automatically removed when THERMAL POWER(1) is greater than or equal to 10^{-4}% of RATED THERMAL POWER(1). During testing pursuant to Special Test Exception 3.10.3, trip may be manually bypassed below 5% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is greater than or equal to 5% of RATED THERMAL POWER.

(d) Trip may be bypassed during testing pursuant to Special Test Exception 3.10.3.

(e) See Special Test Exception 3.10.2.

(f) Each channel shall be comprised of two trip breakers; actual trip logic shall be one-out-of-two taken twice.

(g) High steam generator level trip may be manually bypassed in Modes 1 and 2, at 20% power and below.

~~(1) As measured by the Logarithmic Power Channels.~~ Delete

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below:

Process Measurement Circuit	Functional Unit Bypassed/Tripped
1. Linear Power (Subchannel or Linear)	Linear Power Level - High Local Power Density - High DNBR - Low
2. Pressurizer Pressure - High	Pressurizer Pressure - High Local Power Density - High DNBR - Low
3. Containment Pressure - High	Containment Pressure - High (RPS) Containment Pressure - High (ESF)
4. Steam Generator Pressure - Low	Steam Generator Pressure - Low Steam Generator ΔP 1 and 2 (EFAS 1 and 2)
5. Steam Generator Level	Steam Generator Level - Low Steam Generator Level - High Steam Generator ΔP (EFAS)
6. Core Protection Calculator	Local Power Density - High DNBR - Low

Add Insert C

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:

a. Verify that one of the inoperable channels has been bypassed and place the other channel in the tripped condition within 1 hour, and

b. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition as listed below:

Process Measurement Circuit	Functional Unit Bypassed/Tripped
1. Linear Power (Subchannel or Linear)	Linear Power Level - High Local Power Density - High DNBR - Low

Add Insert D

TABLE 3.3-1 (Continued)

ACTION STATEMENTS

2.	Pressurizer Pressure - High	Pressurizer Pressure - High Local Power Density - High DNBR - Low
3.	Containment Pressure - (RPS) High	Containment Pressure - High Containment Pressure - High (ESF)
4.	Steam Generator Pressure - Low	Steam Generator Pressure - Low Steam Generator ΔP 1 and 2 (EFAS 1 and 2)
5.	Steam Generator Level	Steam Generator Level - Low Steam Generator Level - High Steam Generator ΔP (EFAS)
6.	Core Protection Calculator	Local Power Density - High DNBR - Low

Add Insert C

STARTUP and/or POWER OPERATION may continue until the performance of the next required CHANNEL FUNCTIONAL TEST. Subsequent STARTUP and/or POWER OPERATION may continue if one channel is restored to OPERABLE status and the provisions of ACTION 2 are satisfied.

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes. *

ACTION 5 - With the number of channels OPERABLE one less those required by the Minimum Channels OPERABLE requirement, STARTUP and/or POWER OPERATION may continue provided the reactor trip breakers of the inoperable channel are placed in the tripped condition within 1 hour; otherwise, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 1 hour for surveillance testing per Specification 4.3.1.1.

ACTION 6 - a. With one CEAC inoperable, operation may continue for up to 7 days provided that at least once per 4 hours, each CEA is verified to be within 7 inches (indicated position) of all other CEAs in its group.

* Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN.

Add Insert D

INSERT A

The operating bypass may be enabled above the 10^{-4}% bistable setpoint and shall be capable of automatic removal whenever the operating bypass is enabled and logarithmic power is below the 10^{-4}% bistable setpoint. Trip may be manually bypassed during physics testing pursuant to Special Test Exception 3.10.3

INSERT B

The operating bypass may be enabled below the 10^{-4}% bistable setpoint and shall be capable of automatic removal whenever the operating bypass is enabled and logarithmic power is above the 10^{-4}% bistable setpoint. During testing pursuant to Special Test Exception 3.10.3, trip may be manually bypassed below 5% of RATED THERMAL POWER; the 10^{-4}% bistable setpoint may be changed to less than or equal to 5% RATED THERMAL POWER to perform the automatic removal function.

INSERT C

7.	Logarithmic Power	Logarithmic Power Level - High Local Power Density – High (1) DNBR – Low (1) Reactor Coolant Flow - Low (1)

INSERT D

(1) With the operating bypass enabled.

Attachment 3

W3F1-2009-0045

Proposed Technical Specification Bases Changes (mark-up)
For Information

3/4.3 INSTRUMENTATION

BASES (Cont'd)

3/4.3.1 and 3/4.3.2 REACTOR PROTECTIVE AND ENGINEERED SAFETY FEATURE SAFETY ACTUATION SYSTEMS INSTRUMENTATION (Continued)

Because of the interaction between process measurement circuits and associated functional units as listed in the ACTIONS 19 and 20, placement of an inoperable channel of Steam Generator Level in the bypass or trip condition results in corresponding placements of Steam Generator ΔP (EFAS) instrumentation. Depending on the number of applicable inoperable channels, the provisions of ACTIONS 19 and 20 and the aforesaid scenarios for Steam Generator ΔP (EFAS) would govern.

The Surveillance Requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. The quarterly frequency for the channel functional tests for these systems comes from the analyses presented in topical report CEN-327: RPS/ESFAS Extended Test Interval Evaluation, as supplemented.

Testing frequency for the Reactor Trip Breakers (RTBs) is described and analyzed in CEN NPSD-951. The quarterly RTB channel functional test and RPS logic channel functional test are scheduled and performed such that RTBs are verified OPERABLE at least every 6 weeks to accommodate the appropriate vendor recommended interval for cycling of each RTB.

RPS\ESFAS Trip Setpoints values are determined by means of an explicit setpoint calculation analysis. A Total Loop Uncertainty (TLU) is calculated for each RPS/ESFAS instrument channel. The Trip Setpoint is then determined by adding or subtracting the TLU from the Analytical Limit (add TLU for decreasing process value; subtract TLU for increasing process value). The Allowable Value is determined by adding an allowance between the Trip Setpoint and the Analytical Limit to account for RPS/ESFAS cabinet Periodic Test Errors (PTE) which are present during a CHANNEL FUNCTIONAL TEST. PTE combines the RPS/ESFAS cabinet reference accuracy, calibration equipment errors (M&TE), and RPS/ESFAS cabinet bistable Drift. Periodic testing assures that actual setpoints are within their Allowable Values. A channel is inoperable if its actual setpoint is not within its Allowable Value and corrective action must be taken. Operation with a trip set less conservative than its setpoint, but within its specified ALLOWABLE VALUE is acceptable on the basis that the difference between each trip Setpoint and the ALLOWABLE VALUE is equal to or less than the Periodic Test Error allowance assumed for each trip in the safety analyses.

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable.

Add Insert E

BASES

Manual Reactor Trip

The Manual Reactor Trip is a redundant channel to the automatic protective instrumentation channels and provides manual reactor trip capability.

Linear Power Level - High

→(DRN 04-1243, Ch. 38)

The Linear Power Level - High trip provides reactor core protection against rapid reactivity excursions. This trip initiates a reactor trip at a linear power level of less than or equal to 108% of RATED THERMAL POWER.

←(DRN 04-1243, Ch. 38)

Logarithmic Power Level - High

The Logarithmic Power Level - High trip is provided to protect the integrity of fuel cladding and the Reactor Coolant System pressure boundary in the event of an unplanned criticality from a shutdown condition. A reactor trip is initiated by the Logarithmic Power Level - High trip at a THERMAL POWER* level of less than or equal to 0.257% of RATED THERMAL POWER, unless this trip is manually bypassed by the operator. The operator may manually bypass this trip when the THERMAL POWER* level is above ~~10-4% of RATED~~ THERMAL POWER; this bypass is automatically removed when the THERMAL POWER* level decreases to 10-4% of RATED THERMAL POWER*.

Delete

Replace with "logarithmic power"

Pressurizer Pressure - High

The Pressurizer Pressure - High trip, in conjunction with the pressurizer safety valves and main steam safety valves, provides Reactor Coolant System protection against overpressurization in the event of loss of load without reactor trip. This trip's setpoint is at less than or equal to 2350 psia which is below the nominal lift setting of 2500 psia for the pressurizer safety valves and its operation avoids the undesirable operation of the pressurizer safety valves.

Pressurizer Pressure - Low

The Pressurizer Pressure - Low trip is provided to trip the reactor and to assist the Engineered Safety Features System in the event of a Loss of Coolant Accident. During normal operation, this trip's setpoint is set at greater than or equal to 1684 psia. This trip's setpoint may be manually decreased, to a minimum value of 100 psia, as pressurizer pressure is reduced during plant shutdowns, provided the margin between the pressurizer pressure and this trip's setpoint is maintained at less than or equal to 400 psi; this setpoint increases automatically as pressurizer pressure increases until the trip setpoint is reached.

~~*As measured by the Logaritmic Power Channels.~~ Delete

SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

BASES

2.2.1 REACTOR TRIP SETPOINTS (Continued)

A Total Loop Uncertainty (TLU) is calculated for each RPS instrument channel. The Trip setpoint is determined by adding or subtracting the TLU from the Analytical Limit (add TLU for decreasing process value; subtract TLU for increasing process value). The Allowable Value is determined by adding an allowance between the Trip Setpoint and the Analytical Limit to account for RPS cabinet Periodic Test Errors (PTE) which are present during a CHANNEL FUNCTIONAL TEST. PTE combines RPS cabinet reference accuracy, calibration equipment errors (M&TE), and RPS cabinet bistable drift. Periodic testing assures that actual setpoints are within their Allowable Values. A channel is inoperable if its actual setpoint is not within its Allowable Value and corrective action must be taken. Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between each Trip Setpoint and the Allowable Value is equal to or less than the PTE allowance assumed for each trip in the safety analyses.

The DNBR - Low and Local Power Density - High are digitally generated trip setpoints based on Limiting Safety System Settings of 1.26 and 21.0 kW/ft, respectively. Since these trips are digitally generated by the Core Protection Calculators, the trip values are not subject to drifts common to trips generated by analog type equipment. The Allowable Values for these trips are therefore the same as the Trip Setpoints.

To maintain the margins of safety assumed in the safety analyses, the calculations of the trip variables for the DNBR - Low and Local Power Density -High trips include the measurement, calculational and processor uncertainties and dynamic allowances as defined in the latest applicable revision of CEN-305-P, "Functional Design Requirements for a Core Protection Calculator" and; CEN-304-P, "Functional Design Requirements for a Control Element Assembly Calculator."

Add Insert E

3/4 INSTRUMENTATION

BASES (Cont'd)

3/4.3.1 and 3/4.3.2 REACTOR PROTECTIVE AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEMS INSTRUMENTATION (Continued)

Response time may be verified by any series of sequential, overlapping, or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the topical report. Respose time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time.

Add Insert F

TABLE 3.3-1, Functional Unit 13, Reactor Trip Breakers

The Reactor Trip Breakers Functional Unit in Table 3.3-1 refers to the reactor trip breaker channels. There are four reactor trip breaker channels. Two reactor trip breaker channels with a coincident trip logic of one-out-of-two taken twice (reactor trip breaker channels A or B, and C or D) are required to produce a trip. Each reactor trip breaker channel consists of two reactor trip breakers. For a reactor trip breaker channel to be considered OPERABLE, both of the reactor trip breakers of that reactor trip breaker channel must be capable of performing their safety function (disrupting the flow of power in its respective trip leg). The safety function is satisfied when the reactor trip breaker is capable of automatically opening, or otherwise opened or racked-out.

If a racked-in reactor trip breaker is not capable of automatically opening, the ACTION for an inoperable reactor trip breaker channel shall be entered. The ACTION shall not be exited unless the reactor trip breaker capability to automatically open is restored, or the reactor trip breaker is opened or racked-out.

→(EC-12084, Ch. 57)

TABLES 3.3-3 and 4.3-2, Functional Unit 6, Loss of Power (LOV)

The Loss of Power Functional Unit 6 in Tables 3.3-3 and 4.3-2 refers to the undervoltage relay channels that detect a loss of bus voltage on the 4kV (A3 & B3) and 480V (A31 & B31) safety buses and a sustained degraded voltage condition on 4kV (A3 & B3) safety buses. The intent of these relays is to ensure that the Emergency Diesel Generator starts on a loss of voltage or a sustained degraded voltage condition. The response time SR in TS 3.3.2 ensures that Bus A3 and B3 undervoltage relays trip and generate a Loss of Voltage (LOV) signal in 2 seconds for initiation of the EDG start. The response time for Bus AB3 and AB31 relays is not as critical as the Bus A3 and B3 undervoltage relays. Bus AB3 and AB31 undervoltage relays [4KVEREL3AB-1A(1B)(1C) and SSDEREL31AB-1A(1B)(1C)] strip bus loads upon an undervoltage condition to preclude any perturbations which might affect the A and B buses and prepare the bus to be energized by an EDG with subsequent loading by the sequencer. Bus AB3 and AB31

←(EC-12084, Ch. 57)

INSERT E

The Core Protection Calculator, High Logarithmic Power (HLP), and Reactor Coolant System Flow use a single bistable to initiate both the permissive and automatic operating bypass removal functions. A single bistable cannot both energize and de-energize at a single, discrete value 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. Also note if the bistable setpoint is changed as part of the Special Test Exception 3.10.3, the same dead band transition is applicable.

INSERT F

TABLE 3.3-1, Functional Unit 3, Logarithmic Power Level –High

In the applicable logarithmic power modes, with the Logarithmic Power circuit inoperable or in test, the associated functional units of Local Power Density-High, DNBR-Low, and Reactor Coolant Flow-Low should be placed in the bypassed or tripped condition. With logarithmic power greater than 10^{-4}% bistable setpoint and Local Power Density-High, DNBR-Low, and Reactor Coolant Flow-Low no longer bypassed (either through automatic or manual action), these functional units may be considered OPERABLE.