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Designated Original

PSEG
Nuclear LLC

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10 CFR 50.90

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

Hope Creek Generating Station
Facility Operating License No. NPF-57
NRC Docket No. 50-354

Subject: **License Amendment Request - Hydrogen Water Chemistry Low Power Restriction**

In accordance with the provisions of 10CFR50.90, PSEG Nuclear LLC (PSEG) hereby requests an amendment of the Technical Specifications (TS) for the Hope Creek Generating Station (HCGS). In accordance with 10CFR50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

PSEG proposes to revise the requirements for operation of the HCGS Hydrogen Water Chemistry (HWC) system; to remove restrictions on operation of the system at low power while maintaining required Main Steamline Radiation Monitor (MSLRM) functions. This change will permit operation of HWC at low power levels thereby increasing the time that it is in service.

The current TS restrictions (footnotes in TS Section 3/4.3.2, Isolation Actuation Instrumentation) limit placing HWC in service until reactor power reaches 20% of rated thermal power. The footnotes also permit increasing the MSLRM setpoints above 20% of rated thermal power to accommodate an expected increase in main steamline radiation with HWC in service.

The original restriction on HWC injection was intended to prevent increases in main steamline radiation background before the MSLRM setpoints were adjusted because it was assumed that the main steamline radiation would increase significantly with HWC operation. However, the present HWC injection rate does not cause an appreciable increase in main steamline radiation; therefore, the reason for prohibiting HWC operation below 20% no longer exists. In addition,

Rec'd DCD 5/21/08
A001 NRR

the HWC system is a non-safety related balance of plant system that does not meet any of the 10 CFR 50.36 criteria for inclusion in the TS. The removal of HWC system from TS is consistent with Standard Technical Specifications (STS) for General Electric Plants (BWR/4), Rev. 3 (NUREG-1433).

Attachment 2 provides the existing TS pages marked-up to show the proposed changes.

PSEG has evaluated the proposed changes in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and has determined this request involves no significant hazards considerations. This amendment to the Hope Creek TS meets the criteria of 10CFR51.22(c)(9) for categorical exclusion from an environmental impact statement.

PSEG requests approval of the proposed License Amendment by March 31, 2009, to be implemented within 30 days, to support Hope Creek Refueling Outage 15.

If you have any questions or require additional information, please do not hesitate to contact Mr. Jeff Keenan at (856) 339-5429.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 4/25/08
(Date)

Sincerely,

George P. Barnes

George P. Barnes
Site Vice President
Hope Creek Generating Station

Attachments (2)

S. Collins, Regional Administrator - NRC Region I
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector - Hope Creek
P. Mulligan, Manager IV, NJBNE

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
Hydrogen Water Chemistry Low Power Restriction

Table of Contents

1.0 DESCRIPTION

PSEG Nuclear LLC (PSEG) proposes to revise the requirements for operation of the Hydrogen Water Chemistry (HWC) system at the Hope Creek Generating Station (HCGS); to remove restrictions on operation of the system at low power while maintaining required Main Steamline Radiation Monitor (MSLRM) functions. This change will permit operation of HWC at low power levels thereby increasing the time that it is in service.

The present HCGS Technical Specifications (TS) contains restrictions on the operation of the HWC system in the form of footnotes in TS Section 3/4.3.2, LCO 3.3.2, Isolation Actuation Instrumentation, Main Steamline Radiation Monitor (MSLRM), function and setpoint. Specifically, TS 3/4.3.2 Table 3.3.2-1 Trip Function 3.b Applicable Operating Condition contains footnote ## and 3/4.3.3.2 Table 3.3.2-2 Trip Function 3.b contains footnote ###. Both footnotes limit placing HWC in service until reactor power reaches 20% of rated thermal power. The footnotes also permit increasing the MSLRM setpoints above 20% of rated thermal power to accommodate an expected increase in main steamline radiation with HWC in service.

The proposed change would revise these footnotes to remove the restriction on HWC operation below 20% rated thermal power while retaining the MSLRM setpoint change provisions.

The original restriction on HWC injection was intended to prevent increases in main steamline radiation background before the MSLRM setpoints were adjusted because it was assumed that the main steamline radiation would increase significantly with HWC operation. However, the present HWC injection rate does not cause an appreciable increase in main steamline radiation; therefore, the reason for prohibiting HWC operation below 20% no longer exists. In addition, the HWC system is a non-safety related balance of plant system that does not meet any of the 10 CFR 50.36 criteria for inclusion in the TS. The removal of HWC system from TS is consistent with Standard Technical Specifications (STS) for General Electric Plants (BWR/4), Rev. 3 (NUREG-1433).

2.0 PROPOSED CHANGE

Current TS 3/4.3.2, LCO 3.3.2, Table 3.3.2-1 Trip Function 3.b Applicable Operating Condition footnote ##, and TS 3/4.3.3.2 Table 3.3.2-2 Trip Function 3.b footnote ###, will be revised as follows:

> ~~*The hydrogen water chemistry (HWC) system shall not be placed in service until reactor power reaches*~~ *Below* 20% of RATED THERMAL POWER, *the Main Steamline Radiation Monitor setpoints shall not exceed the values determined using normal full power background radiation levels with the hydrogen water chemistry (HWC) system shut down.* After reaching 20% of RATED THERMAL POWER~~, and prior to operating the HWC system,~~ the normal full power background radiation level

and associated trip setpoints may be increased to levels previously measured during full power operation with hydrogen injection. Prior to decreasing below 20% of RATED THERMAL POWER ~~*and after the HWC system has been shut off,*~~ the background level and associated setpoint shall be returned to the normal full power values. If *the Main Steamline Radiation Monitor setpoints have been increased for HWC operation and* a power reduction event occurs so that the reactor power is below 20% of RATED THERMAL POWER without the required setpoint change, control rod motion shall be suspended (except for scram or other emergency actions) until the necessary setpoint adjustment is made.

In addition to the above proposed change, one clarification to the current location of footnote ## on page 3/4 3-12 (Table 3.3.2-1 Trip Function 3.b) is being proposed. Currently the mode applicability is indicated as:

1, 2, 3 ##

This could be interpreted to be applicable to Modes 1, 2 and 3, or to just Mode 3. PSEG Nuclear is requesting a clarification to the mode applicability as follows:

1 ##, 2##, 3

The power restrictions of HWC only apply to power operation and startup modes (Modes 1 and 2).

Attachment 2 provides the existing TS pages marked-up to show the proposed changes.

3.0 BACKGROUND

The HWC system injects hydrogen into the primary coolant system to reduce Intergranular Stress Corrosion Cracking (IGSCC). The original system required hydrogen flow rates that caused significant increases in main steamline radiation. The TS was amended (Amendment 8) to permit use of HWC on a test basis. Amendment 23 made permanent TS changes for HWC operation. The TS restricted HWC operation until after 20% of rated thermal power, and permitted increasing the MSLRM isolation setpoint from 3 times normal full power background to 3 times the full power background measured with HWC in service. The MSLRM is credited with mitigating the consequences of a Control Rod Drop Accident (CRDA) that is of concern only below 10% power. An increase in setpoint would reduce the sensitivity of the MSLRM to fuel failures resulting from a CRDA. Therefore, increasing the MSLRM setpoints was permitted only above 20% of rated thermal power where a control rod drop was analyzed not to create fuel failures. The Electric Power Research Institute (EPRI) provided the basis for the original HWC system design (Reference 7.1). The NRC accepted this analysis in Amendments 8 and 23.

Amendment 53 removed the MSLRM scram and MSIV closure functions, and HCGS subsequently modified the plant to remove these functions. Amendment 53 did not, however, remove the function to trip the Mechanical Vacuum Pumps (MVP). The

HCGS CRDA Analysis still credits MVP trip. Amendment 143 added specific testing requirements for the MVP trip function to TS 3/4.3.10.

In 2007, HCGS implemented the General Electric NobleChem™ application (Reference 7.7). This allowed the HWC hydrogen injection rate to be reduced significantly from 35 scfm to approximately 9 scfm at full power. The resulting main steamline radiation background, at full power, was only approximately 8% higher than the non-HWC full power background. The HWC hydrogen injection rate is increased proportionally to power level; flow rates are lower at lower power levels.

EPRI has developed recommendations for improvements to HWC system availability and IGSCC protection (Reference 7.2). One of these enhancements is to begin operation of the system at approximately 5% of rated thermal power. PSEG wishes to implement this recommendation at HCGS; with HWC operation commencing when at least one secondary condensate pump and a Steam Jet Air Enjector (SJAE) are in service (approximately 5% of rated thermal power). The technical justification is discussed in Section 4.0.

HCGS has submitted a License Amendment Request to implement a Constant Pressure Power Uprate (Reference 7.6). Implementation of the power uprate is expected to require an increase in HWC hydrogen flow rate but without significant increase in main steamline radiation background at full power with HWC in service. The power uprate will have no adverse impact on operation of HWC at low power.

The removal of HWC system from TS is consistent with Standard Technical Specifications (STS) for General Electric Plants (BWR/4), Rev. 3 (NUREG-1433). The HWC system is a non-safety related balance of plant system that does not meet any of the 10 CFR 50.36 criteria for inclusion in the TS; this is evaluated in Section 5.2.

4.0 TECHNICAL ANALYSIS

The Isolation Actuation system at HCGS uses the MSLRM to trip the two MVPs and isolate the Reactor Water Sample lines via valves SV-4310, Inboard Containment Isolation Valve (Recirc Loop Sampling) and SV-4311[1], Outboard Containment Isolation Valve (Recirc Loop Sampling), (Reference 7.4). The MVP trip is credited in the CRDA Analysis (Reference 7.3). The MVPs are secured prior to exceeding 5% of rated thermal power as required by plant procedures (Reference 7.5). The sample line isolations are not credited in the CRDA Analysis.

The TS footnotes (described in Sections 1.0 and 2.0 above) were intended to provide a means to safely increase the MSLRM setpoints to permit operation of the HWC system at higher main steamline radiation background levels. The MSLRM setpoints without HWC injection are assumed in the CRDA and must be maintained below 20% of rated thermal power. The original restriction on HWC injection was intended to prevent

[1] The GE nomenclature for these valves is B31-F019 and B31-F020, respectively.

increases in main steamline radiation background before the MSLRM setpoints were adjusted because it was assumed that the main steamline radiation would increase significantly at low power. Reference 7.1, Section 8.2, discusses the reasons for a dual MSLRM setpoint and concluded that increases in setpoint above 20% power can be justified independent of HWC. Since the present HWC injection rate does not cause an appreciable increase in main steamline radiation (as discussed in Section 3.0 above), the reason for prohibiting HWC operation below 20% no longer exists. The required MSLRM setpoints below 20% will not be impacted by operation of HWC at low power.

The proposed changes would remove the limitation on HWC operation below 20% power and maintain the controls on the MSLRM setpoint, still permitting setpoint increases above 20% of rated thermal power if required to operate HWC. Future increases in the MSLRM setpoints are not anticipated but this provides flexibility should the need arise.

Reference 7.2 and 7.8 evaluated HWC injection at low power conditions and concluded that it was feasible and beneficial to IGSCC prevention. Several operating BWR plants have already implemented this change, including LaSalle and Cooper. The implementation of low power HWC operation will follow the guidelines in BWRVIP-156 (Reference 7.2) to ensure reliable operation of the HWC system. Low power operation of HWC will be controlled by Plant procedures.

In addition to the above analyzed change, one clarification to the current location of footnote ## on page 3/4 3-12 (Table 3.3.2-1 Trip Function 3.b) is being proposed. Currently the mode applicability is indicated as:

1, 2, 3 ##

This could be interpreted to be applicable to Modes 1, 2 and 3, or to just Mode 3. Neither of these interpretations is accurate. PSEG Nuclear is requesting a clarification to the mode applicability as follows:

1 ##, 2##, 3

Clarifying that the power restrictions of HWC only apply to power operation and startup modes (Modes 1 and 2) is acceptable because the MVP trip function for the CRDA is only applicable in Modes 1 and 2 (reference TS Bases 3/4.3.10).

5.0 Regulatory Safety Analysis

5.1 Basis for proposed no significant hazards consideration determination

As required by 10CFR50.91(a), PSEG provides its analysis of the no significant hazards consideration. According to 10 CFR 50.92(c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or
2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
3. Involve a significant reduction in a margin of safety.

The determinations that the criteria set forth in 10CFR50.92 are met for this amendment request are indicated below:

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   Hope Creek Generating Station (HCGS) proposes to amend Technical Specification (TS) 3/4.3.2 to remove a limitation on operation of the Hydrogen Water Chemistry (HWC) System below 20% of rated thermal power. The original HWC system injected hydrogen into the condensate system at levels that caused significant increases in the main steamline radiation background. As a consequence, it was necessary to also increase the Main Steamline Radiation Monitor (MSLRM) setpoints to prevent undesirable MSLRM alarms and reactor water sample line isolations. However, the MSLRM is credited with mitigating the consequences of a Control Rod Drop Accident (CRDA) that is of concern only below 10% power. An increase in setpoint would reduce the sensitivity of the MSLRM to fuel failures resulting from a CRDA. Therefore, increasing the MSLRM setpoints is permitted only above 20% of rated thermal power where a control rod drop was analyzed not to create fuel failures. As a result of a revised system application, the HWC injection rate is now much lower than that applied originally, and main steamline radiation does not increase significantly when HWC is placed in service. Consequently there is no impact on the MSLRM setpoints at low power (below 20%).

   HWC injection itself is not associated with any accident or operational occurrence analyzed in the Updated Final Safety Analysis Report (UFSAR). The purpose of HWC is to reduce Intergranular Stress Corrosion Cracking (IGSCC) in the reactor coolant system. IGSCC can lead to a loss of coolant accident. Lowering the power level at which HWC injection is initiated will increase the time that hydrogen is injected and improve IGSCC prevention. Low power operation is recommended, by EPRI, to increase the time that HWC is in service. EPRI has evaluated HWC operation on plant safety systems and concluded that there are no adverse effects associated with HWC injection at low power. The implementation of low power HWC operation will follow the guidelines in BWRVIP-156 (Reference 7.2) to ensure reliable operation of the HWC system.

   The Control Rod Drop Accident (CRDA) is the only accident applicable to the MSLRM isolation actuation function. This accident can result in fuel failures if it

occurs below 10% of rated thermal power but is not of concern above 10% power. The MSLRM trips the two Mechanical Vacuum Pumps (MVP) and isolates reactor water sample lines on high main steamline radiation. The MSLRM is credited with fuel failure detection and MVP trips in the CRDA Analysis. The MVPs are secured prior to reaching 5% of rated thermal power. The proposed change does not alter the present TS requirement prohibiting MSLRM setpoint increases below 20% of rated thermal power and thereby does not change the plant response assumed in the CRDA Analysis.

In conclusion, the proposed change will not significantly increase the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated.

   Response: No.

   The HWC injects hydrogen into the secondary condensate pump suction lines and injects oxygen into the Offgas system. The existing TS prohibits HWC operation at power levels below 20% of rated thermal power. The proposed change would permit HWC at any power level. Operating procedures would begin the HWC injection at approximately 5% power when sufficient condensate flow is available to transport the hydrogen in the reactor coolant system. Injection of hydrogen into the reactor coolant system has proven to be beneficial to the reactor vessel and recirculation system piping components. The implementation of low power HWC operation will follow the guidelines in BWRVIP-156 (Reference 7.2) to ensure reliable operation of the HWC system. The TS requirements for the MSLRM Isolation Actuation functions will remain unchanged. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the change involve a significant reduction in a margin of safety?

   Response: No.

   The safety margin applicable to this change is the MSLRM setpoint to main steamline radiation assumed in the CRDA Analysis. The MSLRM trip of the MVPs is credited in the CRDA Analysis. The MSLRM setpoint requirements are not changed by this proposed license amendment; both the existing and proposed footnotes associated with the MSLRM Isolation Actuation TS permit increasing the MSLRM setpoints only if the plant is operated above 20% of thermal power. This is outside the power range at which the CRDA is of concern. There is no other safety margin associated with operation of HWC. Therefore, there is no reduction in the margin of safety.

5.2 Applicable Regulatory Requirements/Criteria

10CFR20.1(c) and Regulatory Guide 8.8 - Potential for increases in main steamline radiation is addressed in 10CFR20.1(c) and Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be as low as Reasonably Achievable (ALARA)". The present and planned future operation of HWC results in lower main steamline radiation levels and lower occupational radiation exposure.

EPRI NP-5283-SR - A - Hydrogen and Oxygen storage issues are addressed in EPRI NP-5283-SR-A, Guidelines for Permanent BWR Hydrogen Water Chemistry Installations – 1987 Revision. The proposed amendment does not impact the HWC system compliance with these requirements

Branch Technical Position CMEB 9.5-1 and NUREG -0800, Section 9.5.1 Standard Review Plan – Hydrogen storage issues in relation to fire protection are addressed in these regulatory documents. The proposed amendment does not impact the HWC system compliance with these regulatory requirements.

10 CFR 50.36 - 10 CFR 50.36 specifies the criteria for limiting conditions for operation (LCOs) in the TS for commercial power reactors. An LCO must be established for items that meet one or more of the following four criteria:

Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant degradation of the reactor coolant pressure boundary.

The HWC system does not involve control room instrumentation that is used to detect a significant degradation of the reactor coolant pressure boundary. The HWC system is a non-safety related balance of plant system; the sole function of the system is to inject hydrogen into the primary coolant system to reduce pipe IGSCC. Therefore, the HWC elements of TS 3/4.3.2 Table 3.3.2-1 footnote ##, and Table 3.3.2-2 footnote ###, do not fall within or satisfy this criterion.

Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The HWC system does not involve a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis. The HWC system is a non-safety related balance of plant system. The MSLRM setpoints without HWC injection, which are assumed in the CRDA and must be maintained below 20% of rated thermal power, are not changed by removal of the HWC low power restriction from TS. Therefore, the HWC elements of TS 3/4.3.2 Table 3.3.2-1 footnote ##, and Table 3.3.2-2 footnote ###, do not fall within or satisfy this criterion.

Criterion 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The HWC system is a non-safety related balance of plant system that has no function in mitigating a design basis accident or transient. The HWC system injects hydrogen into the primary coolant system solely to reduce IGSCC. The MSLRM setpoints without HWC injection, which are assumed in the CRDA and must be maintained below 20% of rated thermal power, are not changed by removal of the HWC low power restriction from TS. Therefore, the HWC elements of TS 3/4.3.2 Table 3.3.2-1 footnote ##, and Table 3.3.2-2 footnote ###, do not fall within or satisfy this criterion.

Criterion 4: A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The HWC system is a non-safety related balance of plant system; the removal of the restriction on operation of the HWC system at low power is not significant to public health and safety. The MSLRM setpoints without HWC injection, which are assumed in the CRDA and must be maintained below 20% of rated thermal power, are not changed by removal of the HWC low power restriction from TS. Therefore, the HWC elements of TS 3/4.3.2 Table 3.3.2-1 footnote ##, and Table 3.3.2-2 footnote ###, do not fall within or satisfy this criterion.

The above evaluation demonstrates that the TS Table notes for HWC do not fall within or satisfy the 10 CFR 50.36 criteria for retention in the TS.

5.3 Conclusion

Removal of the HWC system low power operation TS restriction involves no significant hazards consideration and is consistent with 10 CFR 50.36. Based on the considerations discussed above:

(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 be conducted in compliance with the Commission's regulations, and

(3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

In accordance with 10 CFR 51.22(b), an evaluation of this license amendment request has been performed to determine whether or not it meets the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) of the regulations.

The proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10CFR20. However, 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 10CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

7.1 EPRI NP-5283-SR-A, Guidelines for Permanent BWR Hydrogen Water Chemistry Installations – 1987 Revision
7.2 EPRI 1011706, BWRVIP-156: BWR Vessel and Internals Project
7.3 UFSAR Section 15.4.9 Control Rod Drop Accident
7.4 UFSAR Section 7.3.1.1.2 Primary Containment and Reactor Vessel Isolation Control Systems
7.5 Procedure HC.OP-SO.CG-0001 CONDENSER AIR REMOVAL OPERATION
7.6 PSEG Letter LR-N06-0286, Request for License Amendment: Extended Power Uprate, September 18, 2006.
7.7 Design Change Package (DCP) 80029363, which issued VTD 325206, "Noble Metal Chemical Addition Technical Safety Evaluation," GE Doc # GE-NE-0000-0042-2228-02-R1.
7.8 GE-NE-0000-0052-0721-01-R0, Feasibility Report, Hope Creek Generating Station HWCI System Low Power Operation and Air Injection

TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES

The following Technical Specifications for Facility Operating No. NPF-57 are affected by this license amendment request:

Technical Specification	Page
TS 3/4.3.3.2 Table 3.3.2-1	3/4 3-12
TS 3/4.3.3.2 Table 3.3.2-1	3/4 3-16a
TS 3/4.3.3.2 Table 3.3.2-2	3/4 3-25

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION	VALVE ACTUATION GROUPS OPERATED BY SIGNAL	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM[a]	APPLICABLE OPERATIONAL CONDITION	ACTION
3. MAIN STEAM LINE ISOLATION				
a. Reactor Vessel Water Level - Low Low Low, Level 1	1	2	1, 2, 3	21
b. Main Steam Line Radiation - High, High	2[b]	2	1##, 2##, 3##	28
c. Main Steam Line Pressure - Low	1	2	1	22
d. Main Steam Line Flow - High	1	2/line	1, 2, 3	20
e. Condenser Vacuum - Low	1	2	1, 2**, 3**	21
f. Main Steam Line Tunnel Temperature - High	1	2/line	1, 2, 3	21
g. Manual Initiation	1, 2, 17	2	1, 2, 3	25
4. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. RWCU Δ Flow - High	7	1/Valve[e]	1, 2, 3	23
b. RWCU Δ Flow - High, Timer	7	1/Valve[e]	1, 2, 3	23
c. RWCU Area Temperature - High	7	6/Valve[e]	1, 2, 3	23
d. RWCU Area Ventilation Δ Temperature-High	7	6/Valve[e]	1, 2, 3	23
e. SLCS Initiation	7[f]	1/Valve[e]	1, 2	23
f. Reactor Vessel Water Level - Low Low, Level 2	7	2/Valve[e]	1, 2, 3	23
g. Manual Initiation	7	1/Valve[e]	1, 2, 3	25

TABLE 3.3.2-1 (Continued)

NOTES

* When handling recently irradiated fuel in the secondary containment and during operations with a potential for draining the reactor vessel.

** When any turbine stop valve is greater than 90% open and/or when the key-locked bypass switch is in the Norm position.

~~The hydrogen water chemistry (HWC) system shall not be placed in service until reactor power reaches~~ *Below* 20% of RATED THERMAL POWER *the Main Steamline Radiation Monitor setpoints shall not exceed the values determined using normal full power background radiation levels with the hydrogen water chemistry (HWC) system shut down.* After reaching 20% of RATED THERMAL POWER~~, and prior to operating the HWC system,~~ the normal full power background radiation level and associated trip setpoints may be increased to levels previously measured during full power operation with hydrogen injection. Prior to decreasing below 20% of RATED THERMAL POWER ~~and after the HWC system has been shutoff,~~ the background level and associated setpoint shall be returned to the normal full power values. If *the Main Steamline Radiation Monitor setpoints have been increased for HWC operation and* a power reduction event occurs so that the reactor power is below 20% of RATED THERMAL POWER without the required setpoint change, control rod motion shall be suspended (except for scram or other emergency actions) until the necessary setpoint adjustment is made.

(a) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

(b) Also trips and isolates the mechanical vacuum pumps.

(c) Also starts the Filtration, Recirculation and Ventilation System (FRVS).

(d) DELETED

(e) Sensors arranged per valve group, not per trip system.

(f) Closes only RWCU system isolation valve(s) HV-F001 and HV-F004.

(g) Requires system steam supply pressure-low coincident with drywell pressure-high to close turbine exhaust vacuum breaker valves.

(h) Manual isolation closes HV-F008 only, and only following manual or automatic initiation of the RCIC system.

(i) Manual isolation closes HV-F003 and HV-F042 only, and only following manual or automatic initiation of the HPCI system.

(j) Trip functions common to RPS instrumentation.

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
7. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION		
a. Reactor Vessel Water Level - Low, Level 3	≥ 12.5 inches*	≥ 11.0 inches
b. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	≥ 82.0 psig	≥ 102.0 psig
c. Manual Initiation	NA	NA

* See Bases Figure B 3/4 3-1.
*** These setpoints are as follows:
160°F - RWCU pipe chase room 4402
140°F - RWCU pump room and heat exchanger rooms
135°F - RWCU pipe chase room 4505
\# 30 minute time delay.
15 minute time delay.
~~The hydrogen water chemistry (HWC) system shall not be placed in service until reactor power reaches~~ *Below* 20% of RATED THERMAL POWER *the Main Steamline Radiation Monitor setpoints shall not exceed the values determined using normal full power background radiation levels with the hydrogen water chemistry (HWC) system shut down.* After reaching 20% of RATED THERMAL POWER~~, and prior to operating the HWC system,~~ the normal full power background radiation level and associated trip setpoints may be increased to levels previously measured during full power operation with hydrogen injection. Prior to decreasing below 20% of RATED THERMAL POWER ~~and after the HWC system has been shutoff,~~ the background level and associated setpoint shall be returned to the normal full power values. If *the Main Steamline Radiation Monitor setpoints have been increased for HWC operation and* a power reduction event occurs so that the reactor power is below 20% of RATED THERMAL POWER without the required setpoint change, control rod motion shall be suspended (except for scram or other emergency actions) until the necessary setpoint adjustment is made.