Entergy

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Mike Bellamy
Site Vice President

December 12, 2001

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

SUBJECT: Entergy Nuclear Generation Company
Pilgrim Nuclear Power Station
Docket No. 50-293
License No. DPR-35

Request for Technical Specification Change Concerning Change of Trip Level Settings, Calibration Frequencies, and Editorial Changes

LETTER NUMBER: 2.01.086

Dear Sir or Madam:

Entergy Nuclear Generating Company's Pilgrim Nuclear Power Station (Pilgrim) requests NRC review and approval for changes to Pilgrim's Technical Specification Tables 3.2.A, 3.2.B, 4.2.A, and 4.2.B in accordance with 10 CFR 50.90. The proposed changes affect various instrument trip level settings and decrease calibration frequencies for a variety of instruments. The proposed change identifies that the Reactor Water Cleanup (RWCU) system requires one channel in each of the two trip systems for each location. The proposed change also clarifies the titles of certain trip systems, moves the note numbers to their proper location, and corrects a misreferenced figure in a table note. These changes will have the affect of improving the usability of the Technical Specifications, decreasing plant staff burden, and reducing radiological dose.

Pilgrim requests that this proposed change be approved by December 2002. Please contact Bryan Ford at (508) 830-8403 if you require further information on this issue.

R.M. Bellamy

Commonwealth of Massachusetts)
County of Plymouth)

Then personally appeared before me, R.M. Bellamy, who being duly sworn, did state that he is Site Vice President of Entergy Nuclear Generating Company and that he is duly authorized to execute and file the submittal contained herein in the name and on behalf of Entergy Nuclear Generating Company and that the statements are true to the best of his knowledge and belief.

My commission expires: September 20, 2002
DATE NOTARY PUBLIC

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Attachment 1: Narrative on Proposed Changes and "No Significant Hazards Consideration"
Attachment 2: Marked-up Technical Specification Pages
Attachment 3: Amended Technical Specification Pages

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ATTACHMENT 1

Description of Proposed Changes

1) Pilgrim Nuclear Power Station (Pilgrim) proposes the following changes to Technical Specifications Table 3.2.A, *"Instrumentation That Initiates Primary Containment Isolation"* (page 3/4.2-7).

   a) The current trip level setting for the "Main Steam Line Tunnel Exhaust Duct High Temperature" is ≤ 170° F. Pilgrim proposes to change the trip level setting to ≤ 175° F.

   b) The trip level setting of the "Turbine Basement Exhaust Duct High Temperature" is currently ≤ 150° F. Pilgrim proposes to change the trip level setting to ≤ 155° F.

   c) The name of the instrument *"Reactor Cleanup System High Flow"* is changed to *"Reactor Water Cleanup System (RWCU) High Flow."*

   d) The trip level setting of the "Reactor Water Cleanup System High Temperature" is currently ≤ 150° F. Pilgrim proposes to change the trip level setting to ≤ 148° F. The number of required channels is corrected to identify the sensors and their locations consistent with plant design and to show that there is one required channel in each of the two trip systems for each location. The sensors and their locations are as follows:

      "RWCU Back Wash Receiver Tank Room High Temperature"
      "RWCU Heat Exchanger and Pump Rooms High Temperature"
      "RWCU Line in RHR Valve Room "A" High Temperature"
      "RWCU Line Near East CRD Modules High Temperature"

   e) The column identifying the number of available channels is removed from the table.

2) Pilgrim proposes the following changes to Technical Specifications Table 3.2.B, *"Instrumentation That Initiates or Controls the Core and Containment Cooling Systems"* (pages 3/4.2-12, 3/4.2-16, and 3/4.2-17):

   a) The trip level settings for the "RHR (LPCI) Pump Discharge Pressure Interlock" is currently 150 ± 10 psig. Pilgrim proposes to change the trip level setting to 160 ± 6 psig.

   b) The trip level settings of the "Core Spray Pump Discharge Pressure Interlock" is currently 150 ± 10 psig. Pilgrim proposes to change the trip level setting to 160 ± 6 psig.

   c) The trip level settings of "RCIC Turbine Compartment Wall", is currently ≤ 170° F. Pilgrim proposes to change the trip level setting to ≤ 168° F.

   d) The "Torus Cavity Exhaust Duct" is renamed "RCIC Exhaust Duct Torus Cavity". The trip level setting of the "RCIC Exhaust Duct Torus Cavity" is currently ≤ 150° F. Pilgrim proposes to change the trip level setting to ≤148° F.

   e) The trip level setting of the "RCIC Valve Station Area Wall" is currently ≤ 200° F. Pilgrim proposes to change the trip level setting to ≤198° F.

f) The “RCIC” Steam Line Lo-Press” is renamed “RCIC Steam Line Low Pressure”. The current trip level setting for the “RCIC Steam Line Low Pressure” trip level setting is 100 > P > 50 psig. The new trip level setting is proposed to be 77 > P > 63 psig.

g) The current trip level setting of the “HPCI Turbine Steam Line High Flow” is ≤ 300% of rated flow. Pilgrim proposes to change the trip level setting to ≤ 296% of rated flow.

h) The "HPCI Turbine Compartment Exhaust Ducts" is renamed "HPCI Turbine Compartment Exhaust Duct". The trip level settings of “HPCI Turbine Compartment Exhaust Duct” is currently ≤ 170° F. Pilgrim proposes to change the trip level setting to ≤ 168° F.

i) The "Torus Cavity Exhaust Duct" for HPCI is renamed "HPCI Exhaust Duct Torus Cavity." The current trip level setting for the “HPCI Exhaust Duct Torus Cavity” high temperature is 190° F - 200° F. Pilgrim proposes to change the trip level setting of this trip function to ≤ 198° F.

j) The current trip level setting for the “HPCI/RHR Valve Station Area Exhaust Duct” high temperature is currently ≤ 170° F. Pilgrim proposes to change the trip level settings of these trip functions to ≤ 168° F.

k) Table 3.2.B, footnote 6 (page 3/4.2-17) was added regarding the trip level setting for the RCIC steam line low-pressure trip function. The footnote clarifies that the pressure indicated for the trip level setting, 70 ± 7 psig, does not include the static head pressure which is 17.5 psi.

l) Pilgrim proposes to move the note numbers on page 3/4.2-16 to the "Remarks" column to correct the numbers' misplacement.

3) Pilgrim proposes the following change to Technical Specifications Table 4.2.A, *"Minimum Test and Calibration Frequency for PCIS"* (page 3/4.2-31 and 3/4.2-41):

a) The current calibration frequency of the "Main Steam High Temp." is "Once/3 months." Pilgrim proposes to change the calibration frequency to "Once/24 months".

b) The "Reactor Water Cleanup High Flow" on Table 4.2.A is renamed "Reactor Water Cleanup System (RWCU) High Flow ". The "Reactor Water Cleanup High Temp" on Table 4.2.A is changed to the following to reflect the change made to Table 3.2.A (see 1d):

“RWCU Back Wash Receiver Tank Room High Temperature”
“RWCU Heat Exchanger and Pump Rooms High Temperature”
“RWCU Line in RHR Valve Room “A” High Temperature”
“RWCU Line Near East CRD Modules High Temperature”

The current calibration frequency for the "Reactor Water Cleanup High Temperature" is "Once/3 months". Pilgrim proposes to change the calibration frequency to "Once/24 months".

c) Reference to Figure 4.1.1 in Note 1 on "Notes for Tables 4.2.A through 4.2.G (page 3/4.2-41)" is changed to reference Figure 4.2-1.

4) Pilgrim proposes the following changes to Technical Specifications Table 4.2.B, "Minimum Test and Calibration Frequency for CSCS" (pages 3/4.2-32 and 3/4.2-33):

a) The current calibration frequency for "ADS - LPCI or CS Pump Disch. Pressure Interlock" is "Once/3 months." Pilgrim proposes to change the calibration frequencies for these instrument channels to "Once/12 months."

b) The current calibration frequency of the "Steam Line High Temp. (HPCI & RCIC)" is "Once/3 months". Pilgrim proposes to change the calibration frequency to "Once/24 months."

c) The current calibration frequency of the "Safeguards Area High Temperature" is "Once/3 months". Pilgrim proposes to change the calibration frequency to "Once/24 months."

d) The current calibration frequency for the "RCIC Steam Line Low Pressure" is "Once/3 months." Pilgrim Station proposes to change the calibration frequencies for these instrument channels to "Once/12 months."

5) Following approval of the proposed Technical Specification changes Pilgrim will make the following changes to Technical Specifications Bases in accordance with Technical Specification 5.6.6.

a) Pilgrim proposes the following changes to Technical Specifications Bases 3.2 "Protective Instrumentation" (page B3/4.2-2):

The current setting of 170° F for the main steam line tunnel detector is low enough to detect leaks on the order of 5 – 10 gpm. Pilgrim proposes to change the trip value to 175° F for the "main steam line tunnel detector," which is low enough to detect leaks ≥ 20 gpm.

b) Pilgrim proposes the following changes to Technical Specifications Bases 3.2 "Protective Instrumentation" (page B3/4.2-3):

i) The current setting of ≤ 300 % of design flow for HPCI high flow and 200° F or 170° F, depending on sensor location, for HPCI high temperature require revision. Pilgrim proposes to change the HPCI high flow trip value to ≤ 296% and HPCI high temperature sensors to ≤ 198° F or ≤ 168° F, depending on sensor location.

ii) The current setting for RCIC area high temperature is 200° F, 170° F, or 150° F, depending on sensor location. Pilgrim proposes to change the RCIC high temperature sensor trip setting to ≤ 198° F, ≤ 168° F, or ≤ 148° F, depending on sensor location.

iii) The current Bases description of the RWCU system temperature and high flow instrumentation is changed by substituting the phrase"... is arranged with one instrument in each trip system for each area" for the current "... are arranged similar as that for the HPCI."

Reason for Proposed Change

Pilgrim station proposes setpoint changes to incorporate the results of setpoint calculations, and decrease calibration frequencies associated with existing instruments, without adversely affecting instrument reliability. The changes also enhance the usability of the Technical Specifications by providing a clearer description of the "RWCU High Temperature" trip configuration. Changing the names of certain trips gives clearer definition of the system and is editorial. Moving the note numbers is editorial and is done for consistency. Correcting the misreferenced figure is administrative.

These changes will have the affect of improving the usability of the Technical Specifications, decreasing plant staff burden, and reduces radiological dose.

Safety Evaluation

The setpoint changes (changes 1a, 1b, 1d, 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h, 2i, 2j) proposed by this Technical Specification change were evaluated in accordance with NRC Regulatory Guide 1.105, Rev. 2 which is a newer, more conservative standard than the original Pilgrim methodology. The trip level settings were determined while analyzing the instruments in accordance with procedures that are subject to a quality assurance program that complies with 10 CFR 50, Appendix B and were found to be acceptable for the reasons described below. The analyses supporting the setpoint changes are based on a 95% probability limit that the trips would occur before the design basis analytical limit is exceeded. Each instrument has a documented "analytical limit" and an "allowable limit." The setpoint calculations fully document the basis for changes to limits, trip level settings, and calibration frequencies.

The trip level setting for the "Main Steam Line Tunnel Exhaust Duct High Temperature" (1a) is currently ≤ 170° F. It is proposed that the trip level setting be increased to ≤ 175° F. The existing Technical Specification limit of ≤170° F was based on detection and isolation of a 10 gpm leak from the main steam lines inside the main steam tunnel. The new trip setting allows detection and isolation of a main steam line leak of 20 gpm with an associated new analytical limit of 178° F. Calculations show that the system leakage would still be detected and isolated in a timely manner (approximately 1.5 hours). The 20 gpm would need to go undetected for > 1000 days before 10 CFR 20 radiological limits could be exceeded. Such a leak going undetected for such a period is highly unlikely and thus the new setting does not result in consequences that exceed 10 CFR 20 dose limits. There is no impact on environmental qualification of electrical equipment from the potential increase in main steam tunnel temperatures. The new setting ensures adequate margin exists between the trip level setting and the new design basis analytical limit to account for all instrument and process inaccuracies and is high enough to avoid spurious isolation signals. Leaks < 20 gpm from adjacent feedwater and RWCU piping inside the main steam tunnel will still be detected by this instrumentation and result in increased area temperature indication in the control room. If the temperature increase persists, actions to identify and isolate these leaks can still be performed as described in the current licensing basis.

The trip level setting for the "Turbine Basement Exhaust Duct High Temperature" (1b) is currently ≤ 150° F. It is proposed that the trip level setting be increased to ≤ 155° F. The existing Technical Specification limit of ≤ 150° F was based on detection and isolation of a 150 gpm leak from the main steam lines in the turbine basement. The new trip setting allows detection and isolation of a main steam line leak of 225 gpm with an associated new analytical limit of 158° F. Calculations show that the system leakage would still be detected and isolated in a timely manner (approximately 1.3 hours). The 225-gpm leak would need to continue undetected for > 7 days before 10 CFR 20 radiological limits could be exceeded. Such a leak going undetected for such a period is unlikely and thus the new setting does not result in consequences that exceed 10 CFR 20 dose limits. There is no impact on environmental qualification of electrical equipment from the potential increase in main steam tunnel temperatures. The new setting ensures adequate margin exists between the trip level setting and the new design basis analytical limit to account for all instrument and process inaccuracies and is high enough to avoid spurious isolation signals. Leaks from other piping in the turbine basement will still be detected by this instrumentation. If the temperature increase persists, actions to identify and isolate these leaks can still be performed as described in the current licensing basis.

Renaming the "Reactor Cleanup System High Flow" to "Reactor Water Cleanup System (RWCU) High Flow" (1c, 3b), removing the column identifying the number of available instruments channels (1e), and relocating footnote numbers to the "Remarks" column (2l) are administrative changes that do not change any technical requirements and do not impact safety.

The trip level setting of the "Reactor Water Cleanup System High Temperature" (1d) is currently ≤ 150° F. It is proposed that the trip level setting be decreased to ≤148° F for all four sensor locations. High temperature in the vicinity of the reactor water cleanup (RWCU) equipment and piping could indicate a break in a RWCU line. When high temperature occurs near the RWCU equipment, the RWCU system is isolated. This new trip level setting ensures that the analytical limit of 150° F will not be exceeded and timely detection and isolation of the RWCU system occurs in the event of a RWCU line break. The new trip level setting of ≤148° F is far enough above normal operational upper limits to avoid spurious isolation, yet low enough to provide timely detection of a line break.

The RWCU system high temperature instruments are delineated by instrument location to insure the appropriate requirements are implemented. The minimum number of instrument channels required to be operable for each location is changed to one in each of 2 trip systems (1d). High temperature in the vicinity of the RWCU system is sensed by four sets of two bimetallic temperature switches. A set of two temperature switches is installed in each of the four areas to be monitored. Each of the switches in an area is capable of initiating isolation of its associated valve(s). This change is consistent with plant design as described in the FSAR and the presentation of this function in NUREG 1433, "Standard Technical Specifications, BWR 3/4".

The trip level settings for the "RHR (LPCI) Pump Discharge Pressure Interlock" (2a) and the "Core Spray Pump Discharge Pressure Interlock" (2b) is currently 150 ± 10 psig. The proposed setting is 160 ± 6 psig. This change requires a higher pump discharge pressure to satisfy, the low pressure Core Standby Cooling System (CSCS) pump running permissive in the ADS logic. The change in trip level settings does not impact system operation because when the LPCI and Core Spray pumps start they generate system pressures greatly exceeding 160 psig immediately after starting and greater than 300 psig during operation; therefore, the change is not significant. This change does not adversely impact integrated CSCS performance.

The trip level setting for the "RCIC Turbine Compartment Wall" (2c) is currently ≤ 170° F. The proposed trip level setting is ≤ 168° F. The trip level setting for the "RCIC Exhaust Duct Torus Cavity" (2d) is currently ≤ 150° F. The proposed trip level setting is ≤ 148° F. The trip level setting for the "RCIC Valve Station Area Wall" (2e) is currently ≤ 200° F. The proposed trip level setting is ≤ 198° F. The new trip level settings for the "RCIC Turbine Compartment Wall" (2c), "RCIC Exhaust Duct Torus Cavity" (2d), and "RCIC Valve Station Area Wall" (2e) are lower. The analytical limits for these setpoints are based on detecting RCIC steam line leaks of approximately 10 gpm and initiating isolation of the RCIC steam line. Calculations conclude that satisfactory margin exists between the trip level settings and the design basis analytical limit to account for all instrument and process inaccuracies. The probability of an inadvertent actuation caused by the decrease in operating margin was evaluated and found to be acceptable; the proposed changes do not increase the probability of an inadvertent actuation based on normal historical operating conditions. The new trip level settings are sufficiently below those for the HPCI system so that preferential isolation of the RCIC steam line occurs in the event of a small line break, and permits the HPCI system to remain operable.

Changing the RCIC "Torus Cavity Exhaust Duct" to "RCIC Exhaust Duct Torus Cavity" (2d) clarifies the instruments' location. This is an administrative change and has no impact on safety.

The trip level setting for the "RCIC Steam Line Low Pressure" (2f), is currently $100 > P > 50$ psig. The proposed trip level setting is $77 > P > 63$ psig. The analytical limit for the "RCIC Steam Line Low Pressure" (2f) was selected to ensure the RCIC steam line is isolated at a value that ensures steam and radioactive gases will not escape from the RCIC turbine shaft seals into the reactor building after steam pressure has decreased to such a low value that the turbine can not be operated. The proposed trip level setting of $77 > P > 63$ psig, by taking into account total instrument loop uncertainty, ensures steam line isolation occurs before the analytical limit is exceeded.

The "HPCI Turbine Steam Line High Flow" (2g) trip level setting is currently ≤ 300% of rated flow. The proposed trip level setting for the "HPCI Turbine Steam Line High Flow" instruments of ≤ 296% is more conservative than the current setting because it isolates HPCI at a slightly lower flow, thereby increasing the margin between the trip level setting and the analytical limit of 300%. The new trip level setting is closer to the normal operating band but it has been determined that adequate operating margin exists. This change does not adversely impact HPCI performance.

The trip level setting for the "HPCI Turbine Compartment Exhaust Duct" (2h) is currently ≤ 170° F. The proposed trip level setting is ≤ 168° F. The trip level setting for the "HPCI Exhaust Duct Torus Cavity" (2i) is currently 190° F – 200° F. The proposed setting is ≤ 198° F. The trip level setting for the "HPCI/RHR Valve Station Area Exhaust Duct" (2j) is currently ≤ 170° F. The proposed trip level setting is ≤ 168° F . The new trip level settings for the "HPCI Turbine Compartment Exhaust Duct" (2h), "HPCI Exhaust Duct Torus Cavity" (2i), and "HPCI/RHR Valve Station Area Exhaust Duct" (2j) are lower. The analytical limits for these setpoints are based on detecting HPCI steam line leaks of approximately 10 gpm and initiating isolation of the HPCI steam line. Decreasing the trip level settings will slightly improve the ability of the instrumentation to detect and isolate steam leaks. Calculations conclude that satisfactory margin exists between the trip level settings and the design basis analytical limit to account for all instrument and process inaccuracies. The probability of an inadvertent actuation caused by the decrease in operating margin was evaluated and found to be acceptable; thus the proposed changes do not increase the probability of an inadvertent actuation based on normal historical operating conditions.

Renaming the "HPCI Turbine Compartment Exhaust Ducts" to "HPCI Turbine Exhaust Duct" (2h) is editorial and does not impact safety.

Renaming the "Torus Cavity Exhaust Duct" to "HPCI Exhaust Duct Cavity"(2i), clarifies the instruments' location. This is an administrative change and has no impact on safety.

The addition of Note 6 (2k) provides information concerning the presence of 17.5 psi static head due to the difference in elevation between the location of the sensing lines attached to the RCIC steam line and the location of the pressure sensing instrument. The note is intended to clarify that the trip level setting is based on the pressure in the steam line (process pressure) rather than instrument sensed pressure. Adding Note 6 is an administrative change and has no impact on safety.

Calibration frequencies are increased for the "Main Steam High Temp" (3a), and the renamed "Reactor Water Cleanup High Temp" (3b) systems, the "ADS-LPCI or CS Pump Disch. Pressure Interlock" (4a), the "Steamline High Temp. (HPCI & RCIC)" (4b), the "Safeguards Area High Temperature" (4c), and the "RCIC Steam Line Low Pressure" (4d). The effect on total instrument loop uncertainty due to decreasing the calibration frequencies were included in the calculations that established the new Technical Specification trip settings in accordance with methodologies endorsed by R.G. 1.105. The calculations conclude that sufficient margin exists between the trip level settings and the design basis analytical limit to account for all instrument and process inaccuracies, including decreased calibration frequencies. Therefore, the decreased calibration frequencies will have no effect on the ability of the affected instrumentation to perform their safety functions.

Note 1 of "Notes for Tables 4.2.A through 4.2.G" is changed to reference Figure 4.2-1 instead of the currently referenced Figure 4.1.1 (3c). This change corrects an oversight that occurred when the reformatting of Technical Specifications granted by Revision 177 renamed Figure 4.1.1 as Figure 4.2-2, but Note 1 was not changed. The content of Figure 4.2-1 is identical to the previous Figure 4.1.1; therefore, this is an administrative change.

Environmental Consideration

The proposed amendment changes instrument surveillance intervals and trip level settings. The proposed change is consistent with accepted engineering practice and methodologies. The proposed change does not impact plant configuration or design. Each proposed change is to be used within the restricted area as defined in 10 CFR Part 20. Pilgrim Nuclear Power Station has determined the amendment involves no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite, and there is no significant increase in individual or cumulative occupational radiation exposure resulting from the implementation of this proposed change. Pilgrim has performed a no significant hazards consideration analysis (see below) and found the proposed amendment involves no significant hazards. Accordingly, Pilgrim concludes the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Part 51.22(c)(9). Therefore, pursuant to 10 CFR Part 51.22(b), Pilgrim concludes no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

No Significant Hazards Considerations

10 CFR 50.91 requires that at the time a licensee requests an amendment, it must provide to the Commission its analysis using the standards in 10 CFR 50.92, to determine no significant hazards considerations. In accordance with 10 CFR 50.91, Pilgrim has performed an analysis for the proposed changes to Technical Specification Tables 3.2.A and B and 4.2.A and B. Operation of Pilgrim in accordance with the proposed amendment:

- Will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The trip level setting and calibration frequency changes proposed by this request for Technical Specification change were evaluated in accordance with Reg. Guide 1.105 and were found to be acceptable. The trip level settings were determined while analyzing the instruments in accordance with procedures that are subject to a quality assurance program that complies with 10 CFR 50, Appendix B. The analyses supporting the trip level setting changes are based on a 95% probability limit that the trips would occur before the design basis analytical limit is reached. Each instrument has a documented "analytical limit" and an "allowable limit." The setpoint calculations fully document the changes to limits, the trip level settings, and the calibration frequencies.

Historical data associated with the subject instruments were used in the applicable trip level setting calculation for each instrument and provide the basis for lengthening the calibration frequencies. The proposed longer calibration frequencies reduce the number of times the devices are subjected to human interaction, reducing the possibility of human error.

The changes affect instruments that serve to mitigate the consequences of accidents and therefore do not affect the probability of accidents occurring. Changes in consequences were evaluated and they do not experience a significant increase because 10 CFR 20 radiological limits continue to be met.

Other changes are editorial or administrative in nature and can not significantly increase the probability or consequences of an accident previously evaluated.

- Will not create the possibility of a new or different kind of accident from any accident previously evaluated.

No new or different types of accidents or malfunctions than those previously analyzed in Pilgrim's UFSAR are introduced by this proposed change because there are no new failure modes introduced. As discussed above in the first part of this No Significant Hazards Consideration, the setpoint changes, and the lengthening of calibration frequencies do not adversely impact safety because the setpoints and frequencies were established using approved methods under a 10 CFR 50 Appendix B, quality assurance program, and because Pilgrim's physical configuration and operational practices are not significantly changed by this proposed change.

Environmental qualification of electrical equipment in effected locations was evaluated. No significant impact was determined.

The editorial changes have no impact on plant configuration or operation; hence these changes do not create the possibility of a new or different kind of accident.

- Will not involve a significant reduction in the margin of safety.

The proposed changes to trip level settings and surveillance intervals were established using approved methodologies subject to a 10 CFR, Appendix B, Quality Assurance program and existing radiological limits are met. These changes do not impact Pilgrim's configuration or operation.

Editorial and administrative type changes do not impact the operation or configuration of Pilgrim. For the above reasons the proposed change does not result in a significant reduction in the margin of safety.

Schedule of Change

This change will be implemented within 90 days following Pilgrim's receipt of NRC approval.

ATTACHMENT 2

MARKED UP TECHNICAL SPECIFICATION PAGES

TABLE 3.2.A

INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION

[MINIMUM # OF]
Operable Instrument Channels Per Trip System (1)

~~Minimum~~	~~Available~~	Instrument	Trip Level Setting	Action (2)
2(7)	2	Reactor Low Water Level	≥11.6" indicated level (3)	A and D
1	1	Reactor High Pressure	≤76 psig	D
2	2	Reactor Low-Low Water Level	at or above - 46.4 in. indicated level (4)	A
2	2	Reactor High Water Level	≤55.4" indicated level (5)	B
2(7)	2	High Drywell Pressure	≤2.22 psig	A
2	2	Low Pressure Main Steam Line	≥810 psig (8)	B
2(6)	2	High Flow Main Steam Line	≤136% of rated steam flow	B
2	2	Main Steam Line Tunnel Exhaust Duct High Temperature	≤~~170~~ [175] °F	B
2	2	Turbine Basement Exhaust Duct High Temperature	≤~~150~~ [155] °F	B
1	1	Reactor [WATER] Cleanup System [(RWCU)] High Flow	≤300% of rated flow	C
~~2~~	2	~~Reactor Cleanup System High Temperature~~	~~≤150°F~~	C
[1]		[RWCU BACK WASH RECEIVER TANK ROOM HIGH TEMPERATURE]	[≤ 148°F]	[C]
[1]		[RWCU HEAT EXCHANGER AND PUMP ROOM HIGH TEMPERATURE]	[≤ 148°F]	[C]
[1]		[RWCU LINE IN RHR VALVE ROOM "A" HIGH TEMPERATURE]	[≤ 148°F]	[C]
[1]		[RWCU LINE NEAR EAST CRD MODULES HIGH TEMPERATURE]	[≤ 148°F]	[C]

PNPS

TABLE 3.2.B (Cont)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum # of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Remarks
1	Core Spray Pump Start Timer	$0.21<t<1$ sec	Initiates sequential starting of CSCS pumps on any auto start.
1	LPCI Pump Start Timer	$4.16<t<5.84$ sec.	
1	LPCI Pump Start Timer	$9.5<t<11.5$ sec.	
1	Auto Blowdown Timer	≥94.4,≤115.6 sec.	In conjunction with Low Low Reactor Water Level, High Drywell Pressure and LPCI or Core Spray Pump running interlock, initiates Auto Blowdown.
2	ADS Drywell Pressure Bypass Timer	9≤t≤15.4 min.	Permits starting CS and LPCI pumps and actuating ADS SRV's if RPV water level is low and drywell pressure is not high.
2	RHR (LPCI) Pump Discharge Pressure Interlock	~~150 ± 10 psig~~ 160 ± 6 psig	Defers ADS actuation pending confimation of Low Pressure Core Cooling System operation. (LPCI or Core Spray Pump running interlock.)
2	Core Spray Pump Discharge Pressure Interlock	~~150 ± 10 psig~~ 160 ± 6 psig	
2	Emergency Bus Voltage Relay	20-25% of rated voltage resets at less than or equal to 50%	1. Permits closure of the Diesel Generator to an unloaded emergency bus. 2. Permits starting of CSCS 4 kV motors.

TABLE 3.2.B (Cont)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum # of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Remarks
2	Condensate Storage Tank Low Level	≥18" above tank zero	Provides interlock to HPCI pump suction valves.
2	Suppression Chamber High Level	≤1'11" below torus zero	
1	RCIC Turbine Steam Line High Flow	≤300% of rated steam flow	(2)
2	RCIC Turbine Compartment Wall	≤~~170~~ 168 °F	(2)
2	~~Torus Cavity Exhaust Duct~~ RCIC EXHAUST DUCT TORUS CAVITY	≤~~150~~ 148 °F	(2)
2	RCIC Valve Station Area Wall	≤~~200~~ 198 °F	(2)
4 (5)	~~RCIC Steam Line Lo Press~~ RCIC STEAM LINE LOW PRESSURE	~~100~~ 77 >P> ~~50~~ 63 psig	(2) (6)
1	HPCI Turbine Steam Line High Flow	≤~~300~~ 296 % of rated flow	(3)
2	HPCI Turbine Compartment Exhaust Ducts	≤~~170~~ 168 °F	(3)
2	~~Torus Cavity Exhaust Duct~~ HPCI EXHAUST DUCT TORUS CAVITY	~~190~~ ~~200~~ ≤198 °F	(3)
2	HPCI/RHR Valve Station Area Exhaust Duct	≤~~170~~ 168 °F	(3)

~~Revision 177~~
Amendment No. 0,-148

NOTES FOR TABLE 3.2.B

1. Whenever any CSCS subsystem is required by Section 3.5 to be operable, there shall be two (Note 5) operable trip systems. If the first column cannot be met for one of the trip systems, that system shall be repaired or the reactor shall be placed in the Cold Shutdown Condition within 24 hours after this trip system is made or found to be inoperable.
2. Close isolation valves in RCIC subsystem.
3. Close isolation valves in HPCI subsystem.
4. Instrument set point corresponds to 79.96 inches above top of active fuel.
5. RCIC has only one trip system for these sensors.
6. DOES NOT INCLUDE STATIC HEAD OF 17.5 psi

PNPS
TABLE 4.2.A

MINIMUM TEST AND CALIBRATION FREQUENCY FOR PCIS

	Instrument Channel (5)	Instrument Functional Test	Calibration Frequency	Instrument Check
1)	Reactor High Pressure	(1)	Once/3 months	None
2)	Reactor Low-Low Water Level	Once/3 months (7)	(7)	Once/day
3)	Reactor High Water Level	Once/3 months (7)	(7)	Once/day
4)	Main Steam High Temp.	(1)	Once/~~3~~ 24 months	None
5)	Main Steam High Flow	Once/3 months (7)	(7)	Once/day
6)	Main Steam Low Pressure	Once/3 months (7)	(7)	Once/day
7)	Reactor Water Cleanup SYSTEM (RWCU) High Flow	(1)	Once/3 months	Once/day
8)	Reactor Water Cleanup High Temp	(1)	Once/~~3~~ 24 months	None
		(1)	ONCE/24 MONTHS	NONE
		(1)	ONCE/24 MONTHS	NONE
		(1)	ONCE/24 MONTHS	NONE

	Logic System Functional Test (4) (6)	Frequency
1)	Main Steam Line Isolation Vvs. Main Steam Line Drain Vvs. Reactor Water Sample Vvs.	Once/Operating Cycle
2)	RHR - Isolation Vv. Control Shutdown Cooling Vvs. Head Spray Discharge to Radwaste	Once/Operating Cycle
3)	Reactor Water Cleanup Isolation	Once/Operating Cycle
4)	Drywell Isolation Vvs. TIP Withdrawal Atmospheric Control Vvs. Sump Drain Valves	Once/Operating Cycle
5)	Standby Gas Treatment System Reactor Building Isolation	Once/Operating Cycle

8) "RWCU Back Wash Receiver Tank Room High Temperature"
9) "RWCU Heat Exchanger and Pump Rooms High Temperature"
10) "RWCU Line in RHR Valve Room "A" High Temperature"
11) "RWCU Line Near East CRD Modules High Temperature"

PNPS

TABLE 4.2.B

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

	Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
1)	Reactor Water Level	(1) (7)	(7)	Once/day
2)	Drywell Pressure	(1) (7)	(7)	Once/day
3)	Reactor Pressure	(1) (7)	(7)	Once/day
4)	Auto Sequencing Timers	NA	Once/Operating Cycle	None
5)	ADS - LPCI or CS Pump Disch. Pressure Interlock	(1)	Once/3 months (12)	None
6)	Start-up Transf. (4160V) a. Loss of Voltage Relays	Monthly	Once/Operating Cycle	None
	b. Degraded Voltage Relays	Monthly	Once/Operating Cycle	None
7)	Trip System Bus Power Monitors	Once/Operating Cycle	NA	Once/day
8)	Recirculation System d/p	(1)	Once/3 months	Once/day
9)	Core Spray Sparger d/p	NA	Once/18 months	Once/day
10)	Steam Line High Flow (HPCI & RCIC)	(1)	Once/3 months	None
11)	Steam Line High Temp. (HPCI & RCIC)	(1)	Once/3 months (24)	None
12)	Safeguards Area High Temp.	(1)	Once/3 months (24)	None

TABLE 4.2.B (Cont)

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

	Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
13)	RCIC Steam Line Low Pressure	(1)	Once/~~3~~ (12) months	None
14)	HPCI Suction Tank Levels	(1)	Once/3 months	None
15)	Emergency 4160V Buses A5 & A6 Loss of Voltage Relays	Monthly	Once/Operating Cycle	None

NOTES FOR TABLES 4.2.A THROUGH 4.2.G

1. Initially once per month until exposure hours (M as defined on Figure ~~4.1.1~~ 4.2-1) is 2.0 x 10^5; thereafter, according to Figure ~~4.1.1~~ 4.2-1 with an interval not less than one month nor more than three months.

2. Functional tests, calibrations and instrument checks are not required when these instruments are not required to be operable or are tripped. Functional tests shall be performed before each startup with a required frequency not to exceed once per week. Calibrations of IRMs and SRMs shall be performed during each startup or during controlled shutdowns with a required frequency not to exceed once per week. Instrument checks shall be performed at least once per day during those periods when the instruments are required to be operable.

3. This instrumentation is excepted from the functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.

4. Simulated automatic actuation shall be performed once each operating cycle. Where possible, all logic system functional tests will be performed using the test jacks.

5. Reactor low water level and high drywell pressure are not included on Table 4.2.A since they are tested on Tables 4.1.1 and 4.1.2.

6. The logic system functional tests shall include a calibration of time delay relays and timers necessary for proper functioning of the trip systems.

7. Calibration of analog trip units will be performed concurrent with functional testing. The functional test will consist of injecting a simulated electrical signal into the measurement channel. Calibration of associated analog transmitters will be performed each refueling outage.

BASES:

3.2 PROTECTIVE INSTRUMENTATION (Cont)

up to the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, CSCS initiation and primary system isolation are initiated in time to meet the above criteria.

The high drywell pressure instrumentation is a diverse signal to the water level instrumentation and in addition to initiating CSCS, it causes isolation of Group 2 isolation valves. For the breaks discussed above, this instrumentation will initiate CSCS operation at about the same time as the low low water level instrumentation; thus the results given above are applicable here also. The low low water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes isolation of Group 1 isolation valves.

Venturis are provided in the main steam lines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steam line break accident. The primary function of the instrumentation is to detect a break in the main steam line. For the worst case accident, main steam line break outside the drywell, steam flow trip setting in conjunction with the flow limiters and main steam line valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel temperatures remain approximately 1000°F and release of radioactivity to the environs is well below 10CFR100 guidelines.

Temperature monitoring instrumentation is provided in the main steam line tunnel and the turbine basement to detect leaks in these areas. Trips are provided on this instrumentation and when exceeded, cause closure of isolation valves. The setting of ~~170~~ 175 °F for the main steam line tunnel detector is low enough to detect leaks on the order of ~~5 to 10~~ ≥ 20 gpm gpm; thus, it is capable of covering the entire spectrum of breaks. For large breaks, the high steam flow instrumentation is a backup to the temperature instrumentation.

Pressure instrumentation is provided to close the main steam isolation valves in the RUN mode before the reactor pressure drops below 785 psig. This function is primarily intended to prevent excessive vessel depressuirzation in the event of a malfunction of the nuclear system pressure regulator. This function also provides automatic protection of the low-pressure core-thermal-power safety limit (25% of rated core thermal power for reactor pressure < 785 psig). In the Refuel or Startup Mode, the inventory loss associated with such a malfunction would be limited by closure of the Main Steam Isolation Valves due to either high or low reactor water level; no fuel would be uncovered. This function is not required to satisfy any safety design bases.

BASES:

3.2 PROTECTIVE INSTRUMENTATION (Cont)

The HPCI high flow and temperature instrumentation are provided to detect a break in the HPCI steam piping. Tripping of this instrumentation results in actuation of HPCI isolation valves. Tripping logic for the high flow is a 1 out of 2 logic, and all sensors are required to be operable.

Temperature is monitored at three (3) locations with four (4) temperature sensors at each location. Two (2) sensors at each location are powered by "A" direct current control bus and two (2) by "B" direct current control bus. Each pair of sensors, e.g., "A" or "B", at each location are physically separated and the tripping of either "A" or "B" bus sensor will actuate HPCI isolation valves.

The trip settings of ≤ 300% of design flow for high flow and 200°F or 170°F, depending on sensor location, for high temperature are such that core uncovery is prevented and fission product release is within limits.

The RCIC high flow and temperature instrumentation are arranged the same as that for the HPCI. The trip setting of ≤ 300% for high flow and 200°F, 170°F and 150°F, depending on sensor location, for temperature are based on the same criteria as the HPCI.

The Reactor Water Cleanup System high flow and temperature instrumentation are arranged similar as that for the HPCI. The trip settings are such that core uncovery is prevented and fission product release is within limits.

The instrumentation which initiates CSCS action is arranged in a dual bus system. As for other vital instrumentation arranged in this fashion, the Specification preserves the effectiveness of the system even during periods when maintenance or testing is being performed. An exception to this is when logic functional testing is being performed.

The control rod block functions are provided to prevent excessive control rod withdrawal. The trip logic for this function is 1 out of n: e.g., any trip on one of six APRM's, two RMB's, eight IRM's, or four SRM's will result in a rod block.

The minimum instrument channel requirements assure sufficient instrumentation to assure the single failure criteria is met. The minimum instrument channel requirements for the RBM may be reduced by one for not longer than 24 hours without significantly increasing the risk of an inadvertent control rod withdrawal.

Reactor power may be varied by moving control rods or by varying the recirculation flow rate. The APRM system provides a control rod block to prevent rod withdrawal beyond a given point, thereby possibly avoiding an APRM Scram. The rod block setpoint is automatically reduced with recirculation flow to form the upper boundary of the PNPS power/flow map. The flow biased APRM rod block is not necessary to prohibit fuel damage and is not included in the analysis of anticipated transients.

ATTACHMENT 3

AMENDED TECHNICAL SPECIFICATION PAGES

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3/4.2-7
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PNPS
TABLE 3.2.A
INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION

Minimum # of Operable Instrument Channels Per Trip System (1)	Instrument	Trip Level Setting	Action (2)
2(7)	Reactor Low Water Level	≥ 11.6" indicated level (3)	A and D
1	Reactor High Pressure	≤ 76 psig	D
2	Reactor Low-Low Water Level	at or above - 46.4 in. indicated level (4)	A
2	Reactor High Water Level	≤55.4" indicated level (5)	B
2(7)	High Drywell Pressure	≤ 2.22 psig	A
2	Low Pressure Main Steam Line	≥ 810 psig (8)	B
2(6)	High Flow Main Steam Line	≤ 136% of rated steam flow	B
2	Main Steam Line Tunnel Exhaust Duct High Temperature	≤ 175° F	B
2	Turbine Basement Exhaust Duct High Temperature	≤ 155° F	B
1	Reactor Water Cleanup System (RWCU) High Flow	≤ 300% of rated flow	C
1	RWCU Back Wash Receiver Tank Room High Temperature	≤ 148° F	C
1	RWCU Heat Exchanger and Pump Room High Temperature	≤ 148° F	C
1	RWCU Line in RHR Valve Room "A" High Temperature	≤ 148° F	C
1	RWCU Line Near East CRD Modules High Temperature	≤ 148° F	C

PNPS

TABLE 3.2.B (Cont)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum # of Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Remarks
1	Core Spray Pump Start Timer	$0.21 < t < 1$ sec	Initiates sequential starting of CSCS pumps on any auto start.
1	LPCI Pump Start Timer	$4.16 < t < 5.84$ sec	
1	LPCI Pump Start Timer	$9.5 < t < 11.5$ sec	
1	Auto Blowdown Timer	$\geq 94.4, \leq 115.6$ sec	In conjunction with Low Low Reactor Water Level, High Drywell Pressure, and LPCI or Core Spray Pump running interlock, initiates Auto Blowdown.
2	ADS Drywell Pressure Bypass Timer	$9 \leq t \leq 15.4$ min.	Permits starting CS and LPCI pumps and actuating ADS SRVs if RPV water level is low and drywell pressure is not high.
2	RHR (LPCI) Pump Discharge Pressure Interlock	160 ± 6 psig	Defers ADS actuation pending confirmation of Low Pressure Core Cooling System operation. (LPCI or Core Spray Pump running interlock.)
2	Core Spray Pump Discharge Pressure Interlock	160 ± 6 psig	
2	Emergency Bus Voltage Relay	20 - 25% of rated voltage resets at less than or equal to 50%	1. Permits closure of the Diesel Generator to an unloaded emergency bus. 2. Permits starting of CSCS 4 kV motors.

TABLE 3.2.B (Cont)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum # of Instrument Channels Per TripSystem (1)	Trip Function	Trip Level Setting	Remarks
2	Condensate Storage Tank Low Level	≥ 18" above tank zero	Provides interlock to HPCI pump suction valves.
2	Suppression Chamber High Level	≤ 1'11" below torus zero	
1	RCIC Turbine Steam Line High Flow	≤ 300% of rated steam flow	(2)
2	RCIC Turbine Compartment Wall	≤ 168°F	(2)
2	RCIC Exhaust Duct Torus Cavity	≤ 148°F	(2)
2	RCIC Valve Station Area Wall	≤ 198°F	(2)
4	RCIC Steam Line Low Pressure	77 > P > 63 psig	(2)(5)(6)
1	HPCI Turbine Steam Line High Flow	≤ 296% of rated flow	(3)
2	HPCI Turbine Compartment Exhaust Duct	≤ 168°F	(3)
2	HPCI Exhaust Duct Torus Cavity	≤ 198°F	(3)
2	HPCI/RHR Valve Station Area Exhaust Duct	≤ 168°F	(3)

NOTES FOR TABLE 3.2.B

1. Whenever any CSCS subsystem is required by Section 3.5 to be operable, there shall be two (Note 5) operable trip systems. If the first column cannot be met for one of the trip systems, that system shall be repaired or the reactor shall be placed in the Cold Shutdown Condition within 24 hours after this trip system is made or found to be inoperable.

2. Close isolation valves in RCIC subsystem.

3. Close isolation valves in HPCI subsystem.

4. Instrument set point corresponds to 79.96 inches above top of active fuel.

5. RCIC has only one trip system for these sensors.

6. Does not include static head of 17.5 psi.

PNPS
TABLE 4.2.A
MINIMUM TEST AND CALIBRATION FREQUENCY FOR PCIS

	Instrument Channel (5)	Instrument Functional Test		Calibration Frequency	Instrument Check
1)	Reactor High Pressure	(1)		Once/3 months	None
2)	Reactor Low-Low Water Level	Once/3 months	(7)	(7)	Once/day
3)	Reactor High Water Level	Once/3 months	(7)	(7)	Once/day
4)	Main Steam High Temp.	(1)		Once/24 months	None
5)	Main Steam High Flow	Once/3 months	(7)	(7)	Once/day
6)	Main Steam Low Pressure	Once/3 months	(7)	(7)	Once/day
7)	Reactor Water Cleanup System (RWCU) High Flow	(1)		Once/3 months	Once/day
8)	RWCU Back Wash Receiver Tank Room High Temperature	(1)		Once/24 months	None
9)	RWCU Heat Exchanger and Pump Room High Temperature	(1)		Once/24 months	None
10)	RWCU Line in RHR Valve Room "A" High Temperature	(1)		Once/24 months	None
11)	RWCU Line Near East CRD Modules High Temperature	(1)		Once/24 months	None

	Logic System Functional Test (4)(6)	Frequency
1)	Main Steam Line Isolation Vlvs. Main Steam Line Drain Vlvs. Reactor Water Sample Vlvs.	Once/Operating Cycle
2)	RHR - Isolation Vv. Control Shutdown Cooling Vlvs. Head Spray Discharge to Radwaste	Once/Operating Cycle
3)	Reactor Water Cleanup Isolation	Once/Operating Cycle
4)	Drywell Isolation Vvs. TIP Withdrawal Atmospheric Control Vvs. Sump Drain Valves	Once/Operating Cycle
5)	Standby Gas Treatment System Reactor Building Isolation	Once/Operating Cycle

PNPS
TABLE 4.2.B
MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

	Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
1)	Reactor Water Level	(1) (7)	(7)	Once/day
2)	Drywell Pressure	(1) (7)	(7)	Once/day
3)	Reactor Pressure	(1) (7)	(7)	Once/day
4)	Auto Sequencing Timers	N/A	Once/Operating Cycle	None
5)	ADS - LPCI or CS Pump Disch. Pressure Interlock	(1)	Once/12 months	None
6)	Start-up Transf. (4160V)			
	a) Loss of Voltage Relays	Monthly	Once/Operating Cycle	None
	b) Degraded Voltage Relays	Monthly	Once/Operating Cycle	None
7)	Trip System Bus Power Monitors	Once/Operating Cycle	N/A	Once/day
8)	Recirculation System d/p	(1)	Once/3 months	Once/day
9)	Core Spray Sparger d/p	N/A	Once/18 months	Once/day
10)	Steam Line High Flow (HPCI & RCIC)	(1)	Once/3 months	None
11)	Steam Line High Temp. (HPCI & RCIC)	(1)	Once/24 months	None
12)	Safeguards Area High Temp.	(1)	Once/24 months	None

TABLE 4.2.B (Cont)

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

	Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
13)	RCIC Steam Line Low Pressure	(1)	Once/12 months	None
14)	HPCI Suction Tank Levels	(1)	Once/3 months	None
15)	Emergency 4160V Buses A5 & A6 Loss of Voltage Relays	Monthly	Once/Operating Cycle	None

NOTES FOR TABLES 4.2.A THROUGH 4.2.G

1. Initially once per month until exposure hours (M as defined on Figure 4.2-1) is 2.0×10^5; thereafter, according to Figure 4.2-1 with an interval not less than one month nor more than three months.

2. Functional tests, calibrations and instrument checks are not required when these instruments are not required to be operable or are tripped. Functional tests shall be performed before each startup with a required frequency not to exceed once per week. Calibrations of IRMs and SRMs shall be performed during each startup or during controlled shutdowns with a required frequency not to exceed once per week. Instrument checks shall be performed at least once per day during those periods when the instruments are required to be operable.

3. This instrumentation is excepted from the functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.

4. Simulated automatic actuation shall be performed once each operating cycle. Where possible, all logic system functional tests will be performed using the test jacks.

5. Reactor low water level and high drywell pressure are not included on Table 4.2.A since they are tested on Tables 4.1.1 and 4.1.2.

6. The logic system functional tests shall include a calibration of time delay relays and timers necessary for proper functioning of the trip systems.

7. Calibration of analog trip units will be performed concurrent with functional testing. The functional test will consist of injecting a simulated electrical signal into the measurement channel. Calibration of associated analog transmitters will be performed each refueling outage.

3.2 PROTECTIVE INSTRUMENTATION (Cont)

up to the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, CSCS initiation, and primary system isolation are initiated in time to meet the above criteria.

The high drywell pressure instrumentation is a diverse signal to the water level instrumentation and in addition to initiating CSCS, it causes isolation of Group 2 isolation valves. For the breaks discussed above, this instrumentation will initiate CSCS operation at about the same time as the low low water level instrumentation; thus the results given above are applicable here also. The low low water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes isolation of Group 1 isolation valves.

Venturis are provided in the main steam lines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steam line break accident. The primary function of the instrumentation is to detect a break in the main steam line. For the worst case accident, main steam line break outside the drywell, steam flow trip setting in conjunction with the flow limiters and main steam line valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel temperatures remain approximately 1000°F and release of radioactivity to the environs is well below 10CFR100 guidelines.

Temperature monitoring instrumentation is provided in the main steam line tunnel and the turbine basement to detect leaks in these areas. Trips are provided on this instrumentation and when exceeded, cause closure of isolation valves. The setting of 175° F for the main steam line tunnel detector is low enough to detect leaks ≥ 20 gpm; thus, it is capable of covering the entire spectrum of breaks. For large breaks, the high steam flow instrumentation is a backup to the temperature instrumentation.

Pressure instrumentation is provided to close the main steam isolation valves in the RUN mode before the reactor pressure drops below 785 psig. This function is primarily intended to prevent excessive vessel depressurization in the event of a malfunction of the nuclear system pressure regulator. This function also provides automatic protection of the low-pressure core-thermal-power safety limit (25% of rated core thermal power for reactor pressure < 785 psig). In the Refuel or Startup Mode, the inventory loss associated with such a malfunction would be limited by closure of the Main Steam Isolation Valves due to either high or low reactor water level; no fuel would be uncovered. This function is not required to satisfy any safety design bases.

BASES:

3.2 PROTECTIVE INSTRUMENTATION (Cont)

The HPCI high flow and temperature instrumentation is provided to detect a break in the HPCI steam piping. Tripping of this instrumentation results in actuation of HPCI isolation valves. Tripping logic for the high flow is a 1 out of 2 logic, and all sensors are required to be operable.

Temperature is monitored at three (3) locations with four (4) temperature sensors at each location. Two (2) sensors at each location are powered by "A" direct current control bus and two (2) by "B" direct current control bus. Each pair of sensors, e.g., "A" or "B", at each location is physically separated and the tripping of either "A" or "B" bus sensor will actuate HPCI isolation valves.

The HPCI trip settings of ≤ 296% of design flow for high flow and ≤ 198° F or ≤ 168° F, depending on sensor location, for high temperature are such that core uncovery is prevented and fission product release is within limits.

The RCIC high flow and temperature instrumentation is arranged the same as that for the HPCI. The trip setting of ≤ 300% for high flow and, depending on sensor location, ≤ 198° F, ≤ 168° F, or ≤ 148° F for temperature are based on the same criteria as the HPCI.

The Reactor Water Cleanup System high flow and temperature instrumentation is arranged with one instrument in each trip system for each area. The trip settings are such that core uncovery is prevented and fission product release is within limits.

The instrumentation which initiates CSCS action is arranged in a dual bus system. As for other vital instrumentation arranged in this fashion, the Specification preserves the effectiveness of the system even during periods when maintenance or testing is being performed. An exception to this is when logic functional testing is being performed.

The control rod block functions are provided to prevent excessive control rod withdrawal. The trip logic for this function is 1 out of n: e.g., any trip on one of six APRMs, two RMBs, eight IRMs, or four SRMs will result in a rod block.

The minimum instrument channel requirements assure sufficient instrumentation to assure the single failure criteria is met. The minimum instrument channel requirements for the RBM may be reduced by one for not longer than 24 hours without significantly increasing the risk of an inadvertent control rod withdrawal.

Reactor power may be varied by moving control rods or by varying the recirculation flow rate. The APRM system provides a control rod block to prevent rod withdrawal beyond a given point, thereby possibly avoiding an APRM Scram. The rod block setpoint is automatically reduced with recirculation flow to form the upper boundary of the PNPS power/flow map. The flow biased APRM rod block is not necessary to prohibit fuel damage and is not included in the analysis of anticipated transients.