Florida Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

November 23, 1998
3F1198-03

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

50

Subject: License Amendment Request #241, Revision 0
High Pressure Injection System Modifications

References:
1. FPC to NRC letter, 3F0697-10, dated June 14, 1997, "Technical Specification Change Request Notice 210"
2. FPC to NRC letter, 3F0997-27, dated September 17, 1997, "High Pressure Injection (HPI) System Modifications to Improve Small Break Loss of Coolant Accident (SBLOCA) Margins"
3. FPC to NRC letter, 3F0997-30, dated September 25, 1997, "Supplement to Technical Specification Change Request Notice 210"
4. FPC to NRC letter, 3F1297-47, dated December 24, 1997, "Technical Specification Change Request Notice 210, Request for Additional Information (TAC No. M98991)"
5. NRC to FPC letter, 3N0198-10, dated January 24, 1998, "Crystal River Unit 3 - Issuance of Amendment RE: Small Break Loss-of-Coolant Accident Mitigation (TAC No. M98991)"

Dear Sir:

Florida Power Corporation (FPC) submitted Technical Specification Change Request Notice (TSCRN) 210 in Reference 1. Several supplements were made to TSCRN 210, including References 2, 3, and 4. The requested changes were issued in Reference 5 as Amendment No. 163 to Operating License No. DPR-72 for Crystal River Unit 3 (CR-3). In Reference 2, FPC committed to install High Pressure Injection (HPI) System cross-ties and passive flow control devices. The modifications proposed in this letter meet that commitment. In addition to presenting these proposed modifications, FPC is requesting revision to several Reactor Protection System and Engineered Safeguards Actuation System Setpoints. The modifications

A001

and setpoint changes involve changes to the Improved Technical Specifications (ITS) and Bases. This letter provides information to support the proposed license changes.

The HPI upgrade project has two primary goals: 1) to reduce the number of operator actions required to mitigate design basis accidents, and 2) to improve HPI mitigation capability. The proposed modifications will eliminate four operator actions that were relied upon in Reference 1 to mitigate SBLOCAs. In addition, peak clad temperature for the limiting SBLOCA will be substantially reduced.

The HPI modifications and setpoint changes will be completed during the next refueling outage scheduled to begin October 1, 1999. Much of the fabrication and installation will be completed prior to the outage, however, some interconnections between the new and existing equipment cannot be initiated until the plant is shutdown. In addition, a large number of procedures will have to be changed and training completed prior to the outage in order to implement the modifications on schedule (most notably the Emergency Operating Procedures). Therefore, FPC requests that this License Amendment Request (LAR) be approved by July 19, 1999. If approved, FPC will implement the LAR prior to startup from the refueling outage.

An overview of the proposed modifications was presented to the NRC Staff on September 21, 1998. At that time, the Staff requested information concerning the post-modification testing of the proposed changes. This information will be sent in a separate submittal by January 29, 1999.

Submittal Format

Attachment A – Regulatory Commitment

This attachment includes a statement of the commitment made in this letter and associated completion date.

Attachment B – Operational Safety Assessment

This attachment provides an integrated operationally oriented assessment of the impact the proposed changes will have on plant response to design basis and licensing basis events. The Background section provides a detailed discussion of the current HPI system, operator actions and accident mitigation challenges. The Description section shows how the proposed modifications eliminate these challenges. This attachment includes sketches of the HPI system before and after the proposed modifications. These sketches are referenced in the Background and Discussion sections of the attachment.

Attachment C – Description and Justification of Proposed ITS and ITS Bases Changes

This attachment provides a description of plant changes and the associated proposed ITS and Bases changes. The justification for the license amendment is presented. The No Significant Hazards Evaluation is also included in this attachment.

Attachment D – Proposed Revised ITS and Bases Pages

This attachment includes the revised ITS and Bases pages. The Bases that incorporate the HPI modifications are provided for information to facilitate the staff review. Changes are marked with revision lines.

Attachment E – Strikeout Version of ITS and Bases Pages

This attachment is provided to facilitate the review of the ITS and Bases changes. This section shows what text was added and what was deleted. The pages provided in Attachment D show the composite result of the additions and deletions.

Attachment F – Simplified Drawing of the HPI System

This drawing is provided to facilitate the review of the proposed ITS and Bases changes. This drawing shows the existing HPI system and the proposed modifications.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Manager, Nuclear Licensing at (352) 563-4883.

Sincerely,

JJHolden

John J. Holden
Director
Site Nuclear Operations

JJH/pei
Attachments

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

STATE OF FLORIDA

COUNTY OF CITRUS

John J. Holden states that he is the Director, Site Nuclear Operations for Florida Power Corporation; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

John J. Holden
Director
Site Nuclear Operations

Sworn to and subscribed before me this 23rd day of November, 1998, by John J. Holden.

Kathy R. Tyler
Signature of Notary Public
State of Florida

Kathy R. Tyler
MY COMMISSION # CC727802 EXPIRES
May 11, 2002
BONDED THRU TROY FAIN INSURANCE, INC.

Kathy R. Tyler
(Print, type, or stamp Commissioned Name of Notary Public)

Personally Known ✓ -OR- Produced Identification ______

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NO. 50-302/LICENSE NO. DPR-72

ATTACHMENT A

LICENSE AMENDMENT REQUEST #241, REVISION 0
HIGH PRESSURE INJECTION SYSTEM MODIFICATIONS

Regulatory Commitment

ATTACHMENT A

Regulatory Commitment

The following table identifies those actions committed to by Florida Power Corporation in this document. Any other actions discussed in the submittal represent intended or planned actions by Florida Power Corporation. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager, Nuclear Licensing of any questions regarding this document or any associated regulatory commitments.

Commitment	Due Date
FPC will submit information concerning post-modification testing of the proposed HPI changes.	January 29, 1999

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NO. 50-302/LICENSE NO. DPR-72

ATTACHMENT B

LICENSE AMENDMENT REQUEST #241, REVISION 0
HIGH PRESSURE INJECTION SYSTEM MODIFICATIONS

Operational Safety Assessment

Introduction

This document provides an operationally oriented safety assessment supporting specific modifications to the High Pressure Injection (HPI) system which will be installed during the next refuel outage, 11R, scheduled in the fall of 1999. The focus of this safety assessment will be accident management capabilities for design basis accidents, specifically Small Break Loss-of-Coolant Accidents (SBLOCAs).

The Background section will address the current HPI system configuration and operation including operational challenges to establish and maintain adequate HPI flow to the reactor coolant system (RCS). Certain single failures, when taken concurrently with a loss-of-offsite power (LOOP), require operator action to establish and maintain adequate HPI flow to the RCS to mitigate a spectrum of SBLOCAs. These operator actions were reviewed by the NRC and approved in License Amendment No. 163. The Discussion section will address planned modifications designed to improve accident management response in terms of HPI system configuration and operation.

Background and Current Configuration (Refer to Figure 1, Page 4 of 5)

There are three HPI pumps, two of which are selected to respond to an Engineered Safeguards (ES) HPI actuation signal, which occurs when RCS pressure decreases to approximately 1500 psig. During plant operation, one of the two ES selected HPI pumps is operating to supply RCS normal makeup (aligned to take suction from the makeup tank) and reactor coolant pump (RCP) seal injection. The remaining ES selected pump is in standby aligned to take suction from the borated water storage tank (BWST). An HPI actuation will automatically configure key makeup system components as follows:

- Sends an open signal to the BWST outlet valves to the HPI pumps
- Starts the standby ES selected HPI pump
- Opens the HPI valves (MUV-23, 24, 25 and 26)
- Closes the normal makeup (NMU) isolation valve (MUV-27)
- Closes the HPI pump recirculation valves (not shown in Figure 1)

Operator action is required to isolate RCP seal injection since no ES signal is sent to the block valve (MUV-18). The resulting configuration maximizes HPI delivery to the RCS. However, one category of SBLOCAs, an HPI line break, could still require an additional operator action. If an HPI line break occurs, then operator action may be required to isolate the broken HPI line. HPI line isolation criteria were developed and guidance incorporated into the Emergency Operating Procedures (EOPs). The criteria states if flow in the highest HPI line is 50 gpm greater than the next highest line, then the highest HPI line is isolated. Prior to making this determination, all four HPI valves must be open with the NMU line isolated.

An initial HPI flow evaluation is performed early in the accident as a function of EOP directed actions. However, should RCS pressure increase, which may occur due to the loss of saturated natural circulation (for a period of time), then operators must re-evaluate the HPI flow distribution and isolate the highest flow line if the isolation criteria are met. None of the operator actions described presents a significant challenge in terms of complexity or time to execute. However, certain single failures can require additional operator actions.

The following example assumes a SBLOCA with a concurrent LOOP and Loss of "A" train DC Electrical System or Battery. This example is intended to present the current operational challenges and how each challenge is managed. Similar challenges exist with the loss of "B" train DC power.

This single failure of "A" train DC power results in a loss of the "A" train ES, including the "A" train emergency diesel generator (EGDG-1A). Due to the loss of the "A" train electrical power, only two of the four HPI valves will automatically open. Operators must recognize this condition, transfer power to the deenergized valves and then open them.

Prior to determining HPI flow through each injection line, the normal makeup isolation valve must be closed. The power supply to the normal makeup isolation valve is ES motor control center (MCC) 3AB, which can be powered from either the "A" train or "B" train ES electrical system, and is normally aligned to the "A" train. With a failure of the "A" train electrical system, the normal makeup isolation valve (and RCP seal injection valve) will not have power to their motor operators. The challenge is that operators must recognize this condition, select the ES MCC to the "B" train power source and then close the subject valves. Once the normal makeup isolation valve is closed, then the operating staff can evaluate HPI flow delivery through each injection line and determine if any one line should be isolated using the HPI line isolation criteria.

Discussion (Refer to Figure 2, Page 5 of 5)

For each of the challenges described in the Background section, EOP directed operator actions are required to mitigate the condition. As indicated in License Amendment No. 163, there are other operator actions, in addition to those needed to manage the HPI system, that may be required to mitigate an accident given a LOOP and single failure. It was determined that the installation of certain plant modifications, scheduled for the upcoming refueling outage, could eliminate several operator actions as well as improve peak clad temperature (PCT) for the worst case SBLOCA.

Although successful accident management is supported by the current system configuration and EOP directed operator actions, improved accident management response will be achieved by the installation of several key modifications.

- Cross-tie lines will be installed downstream of the HPI control valves. Each of the two cross-tie lines will contain a single air operated block valve that will receive an open signal from both ES actuation trains. This assures HPI flow will be directed through all four HPI lines at the time an ES actuation occurs without operator action. This automatic action will improve PCT for the worst case SBLOCA.

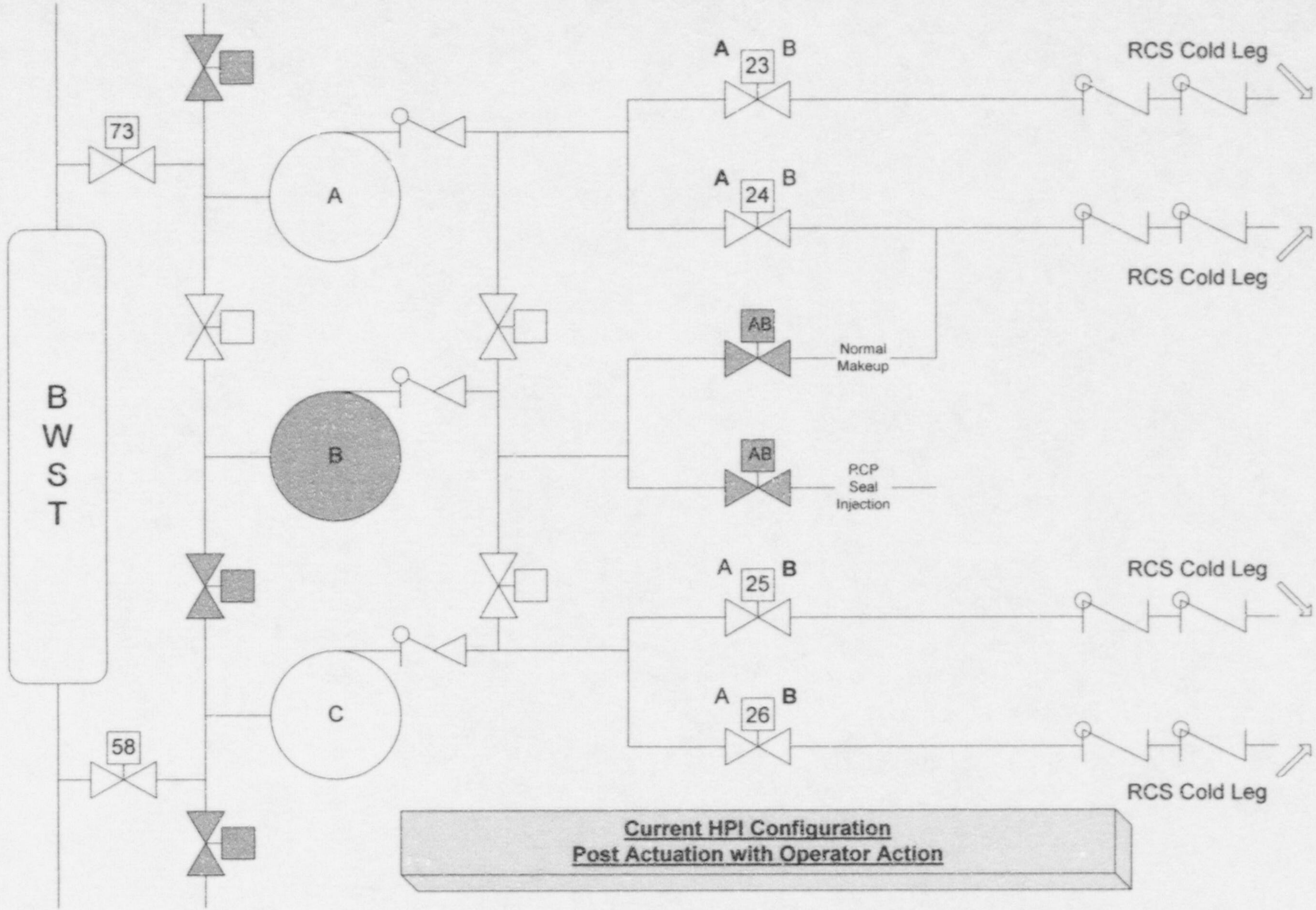
- A new "A" train powered motor operated valve will be installed in the common line that supplies normal makeup and RCP seal injection. The existing normal makeup isolation and RCP seal injection isolation valves will be configured to receive power from the "B" train electrical system. All three valves will close on an ES signal to ensure normal makeup and RCP seal injection flow will be isolated even with a single failure. Operator action will no longer be required other than to verify that these flow paths have been isolated as part of standard ES actuation verification.

- Pre-set throttle valves will be installed in each HPI line downstream of the cross-tie lines. These valves will establish an HPI flow balance that eliminates the need to recognize and isolate an HPI line break.

Summary and Conclusions

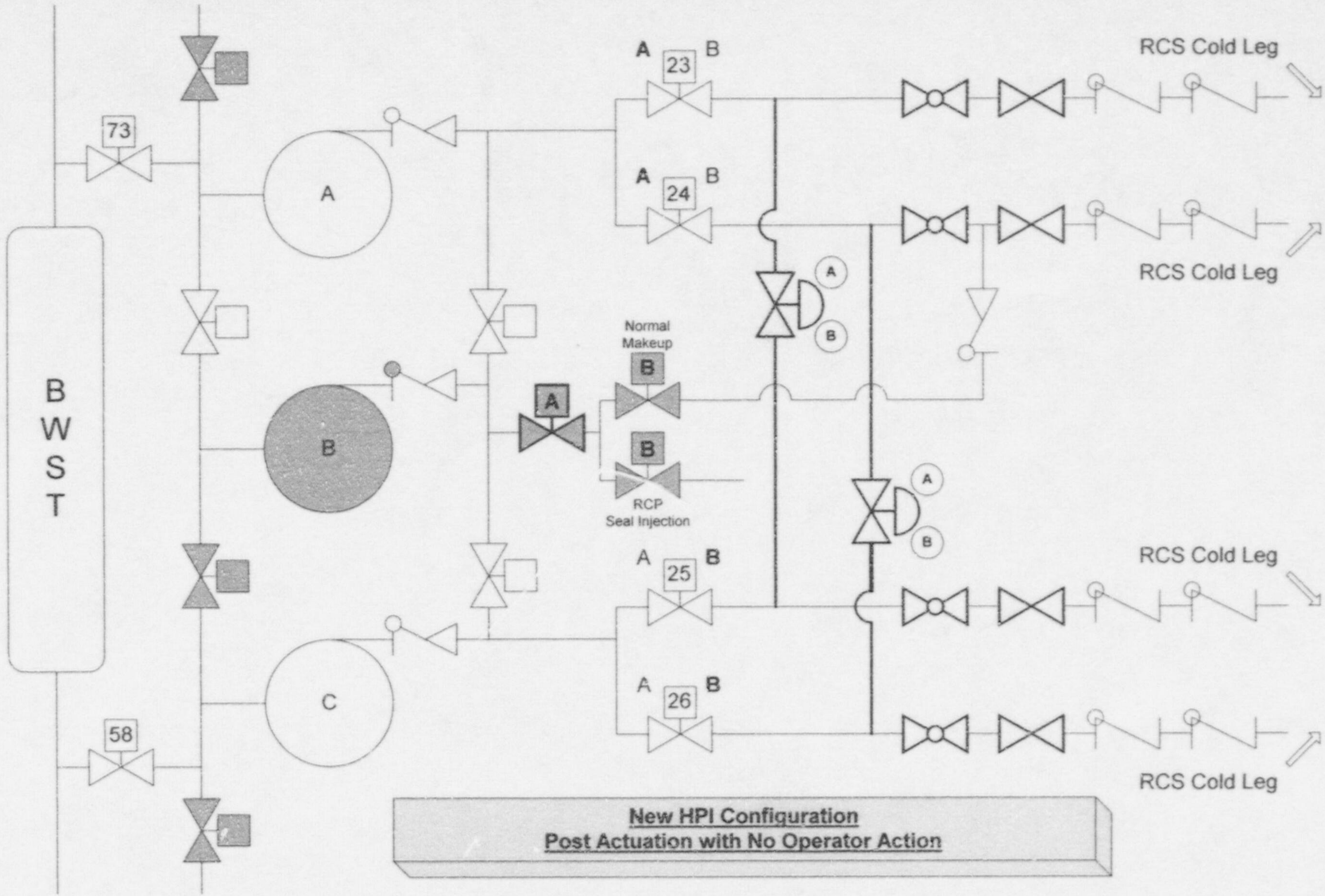
The installation of key HPI system modifications will eliminate a number of operator actions credited to mitigate SBLOCAs. Operator action will not be required to isolate normal makeup or RCP seal injection as the new design will ensure these flow paths are automatically isolated. Operator action will no longer be required to identify and isolate a broken HPI line to assure accident mitigation. The operators will also not be required to switch power supplies to the HPI injection valves on the failure of a train of DC power. In addition, HPI flow delivery will be improved for certain single failure scenarios.

Figure 1



Current HPI Configuration
Post Actuation with Operator Action

Figure 2


BWST
73
58
A
B
C
A 23 B
A 24 B
A 25 B
A 26 B
A
Normal Makeup
B
B
RCP Seal Injection
A
B
A
B
RCS Cold Leg
RCS Cold Leg
RCS Cold Leg
RCS Cold Leg
New HPI Configuration
Post Actuation with No Operator Action

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NO. 50-302/LICENSE NO. DPR-72

ATTACHMENT C

LICENSE AMENDMENT REQUEST #241, REVISION 0
HIGH PRESSURE INJECTION SYSTEM MODIFICATIONS

Description and Justification of
Proposed ITS and ITS Bases Changes

Introduction

This document provides the basis for the proposed Improved Technical Specifications (ITS) changes associated with the installation of High Pressure Injection (HPI) System modifications and Reactor Protection System (RPS) and Engineered Safeguards Actuation System (ESAS) setpoint changes. This submittal also demonstrates that the proposed license changes involve no significant hazards consideration in accordance with 10 CFR 50.92.

Background

The Small Break Loss of Coolant Accident (SBLOCA) analysis for Crystal River Unit 3 (CR-3) currently takes credit for several operator actions in order to achieve successful mitigation. In Reference 2, FPC committed to enhance the HPI system before Cycle 12 in order to reduce the number of required operator actions. The modifications described in this letter, along with those proposed for the Emergency Feedwater (EFW) System (contained in a separate submittal, FPC to NRC letter, 3F1198-01), will provide a significant reduction in operator burden.

Description of Plant Changes

FPC is planning to install a number of modifications to improve the performance and reliability of the HPI System. The following is a list of the most significant modifications:

- Addition of HPI cross-tie lines and air operated isolation valves (MUV-586 and MUV-587)

  The purpose of the HPI cross-tie lines is to ensure that flow is delivered to all four lines upon an HPI ES actuation. Currently, operator action is credited for establishing flow to all four HPI lines approximately ten minutes into the accident. The cross-tie modification will permit increased flow during the first ten minutes, without operator action. The additional flow early in the transient will reduce peak clad temperatures (PCTs) for accident scenarios involving failures that result in flow to less than four HPI lines.

  The cross-tie lines will have air operated isolation valves that receive an open signal from both "A" and "B" train HPI ES signals. These valves will be normally closed and fail open on a loss of air.

- Addition of throttle valves in HPI lines (MUV-590, 591, 592 and 593)

  The preset throttle valves will provide balanced flow to the reactor coolant system (RCS) on an ES actuation. In the event of an HPI line break, the throttle valves will limit flow out of the broken line to ensure flow to the core is within analyzed limits. The throttle valves will be secured in the preset position to prevent changes in flow characteristics.

- Addition of an "A" train isolation valve (MUV-596) in the common line for makeup and RCP seal injection

- Repowering seal injection (MUV-18) and makeup line (MUV-27) isolation valves from "AB" power to "B" train power

  A new motor operated valve (MOV), MUV-596, will be added to the common line for RCP seal injection and normal makeup. This valve will be powered by an "A" train safety-related AC Motor Control Center (MCC) and will receive a closed signal on an "A" train HPI ES signal. This valve, in combination with MUV-18 and MUV-27, will assure isolation of seal injection and makeup flow.

  Both MUV-18 and MUV-27 will be powered from a safety-related "B" train MCC. Both of these valves will get a close signal on a "B" train HPI ES signal. Isolation will be provided by MUV-18 in the seal injection line and MUV-27 in the normal makeup line. These valves will be redundant to MUV-596 to ensure that both makeup and seal injection lines will be isolated when HPI is required. This isolation will ensure HPI flow enters the RCS through the HPI lines and will result in greater flow to the core and reduced PCTs.

- Raising the ESAS setpoint for HPI actuation from 1500 psig to 1625 psig

  The RCS low pressure ESAS setpoint will be changed from 1500 psig to 1625 psig. This change will provide for earlier actuation of HPI and will result in lower PCT values for smaller size SBLOCA cases. For larger SBLOCA transients, depressurization will occur more rapidly and the higher actuation setpoint will have no significant impact.

  The applicability requirement for ESAS OPERABILITY will be changed from above 1700 psig to above 1800 psig. The HPI ESAS can be bypassed when RCS pressure is below the applicable condition. A graphical representation of the setpoints is included as Figure 3, Page 9 of 9.

- Raising the RPS setpoint for RCS Low Pressure from 1800 psig to 1900 psig

  In order to maintain plant operating margins, the RCS low pressure reactor trip setpoint will be raised from 1800 psig to 1900 psig. A review of industry data shows that an RCS low pressure reactor trip setpoint of 1900 psig is in use at other Babcock and Wilcox (B&W) reactors and is well within the range of setpoints found for other pressurized water reactors.

- Raising the RPS setpoint for Shutdown Bypass (RCS High Pressure) from 1720 psig to 1820 psig

  The Shutdown Bypass (RCS High Pressure) reactor trip setpoint will be raised from 1720 psig to 1820 psig. This change will allow selecting shutdown bypass in the same procedural sequence as it is currently performed (prior to bypassing the HPI ESAS).

Several other planned modifications are shown on the drawing in Attachment F. These changes do not directly impact this submittal but are mentioned here for completeness.

- Addition of a check valve in the HPI line.
- Addition of manual maintenance valves in the cross-tie and HPI lines.
- Addition of a stop check valve for throttling in the normal makeup line for Low Temperature Overpressure Protection (LTOP) concerns. This new valve will provide the same protection that was previously provided by the HPI pump discharge stop check valves.
- Relocation of normal makeup flow to a point downstream of the preset throttle valves.

Discussion of HPI Modifications' and Setpoint Changes' Effect on Risk

The HPI upgrade project (modifications and setpoint changes) is not being pursued to resolve concerns from a risk informed perspective. The HPI upgrade project will eliminate several scenarios that require operator actions for SBLOCA mitigation. However, these scenarios are very low probability events and therefore do not have significant impact on the CR-3 Probabilistic Safety Assessment (PSA). A PSA evaluation was performed reflecting the modified HPI system and the reduction in operator actions and the consequential potential for errors. These changes will reduce the PSA core damage frequency by approximately one percent.

Both the existing configuration with approved operator actions and the proposed modified HPI system produce PCT results that are compliant with 10 CFR 50.46. The modified HPI system will result in reduced PCTs for the worst case SBLOCA and a limited spectrum of other SBLOCAs. Therefore, these changes will provide additional safety margin for these LOCA sequences.

Operator Actions

The planned HPI modifications will reduce the number of operator actions (OAs) that need to be taken during a SBLOCA. Four OAs will be removed from the EOPs. These actions were designated in References 3 and 5 as follows:

OA3 – Ensure all four HPI lines are open – switch power for affected injection valves by manipulating switches in control room.

Operator Action OA3 can be eliminated because the new cross-tie lines will ensure flow to all four HPI lines even if two of the HPI valves do not open (e.g., failure of a DC Bus).

OA4 – Isolate RCP seal injection (As a contingency action, if power is lost to MUV-27 [normal makeup] and MUV-18 [RCP seal injection], transfer to an energized bus and close valves).

Operator Action OA4 can be deleted because the new "A" train isolation valve and the re-powering of the "B" train valves will ensure this flow path will be isolated even with a single failure.

OA5 – Ensure adequate HPI flow (isolate a broken injection line using new isolation criteria).

OA17 – Periodically re-evaluate HPI line break criteria on RCS repressurization.

Operator Actions OA5 and OA17 will no longer be needed because the preset throttle valves will ensure adequate flow to the RCS even with an HPI line break. In addition, the throttle valves will balance flow so that operator action to isolate a broken HPI line will not be required.

Description of the Proposed ITS Changes

In the Reactor Protection System (RPS) Instrumentation, Section 3.3.1, the RCS Low Pressure reactor trip setpoint is being raised from 1800 psig to 1900 psig and the Shutdown Bypass RCS High Pressure reactor trip setpoint is being raised from 1720 psig to 1820 psig. These changes are made on Table 3.3.1-1, Items 4 and 11, and the associated Bases Section 3.3.1.

In ESAS Instrumentation Section 3.3.5, Table 3.3.5-1, Item 1, Reactor Coolant System Pressure - Low, the Allowable Value is raised from 1500 psig to 1625 psig and the applicable condition is changed from 1700 psig to 1800 psig. The applicability condition change also applies to Action C.2. The change to the ESAS setpoint and applicable condition is also revised in the Bases for 3.3.5.

Several changes are being made to Post-Accident Monitoring (PAM) Instrumentation Bases 3.3.17, Table 3.3.17-1. Containment Isolation Valve Position (Item 10) is revised to show that MUV-27 is removed from the ES Light Matrix "AB" and placed in the ES Light Matrix "B". Also, MUV-18 is added to the ES Light Matrix "B". This change reflects the change in power source for MUV-27 and MUV-18 from the "AB" bus to the "B" bus. Both valves will close on a "B" train ES signal.

The following information is being added to the Bases of 3.3.17 for Item 6 HPI Flow:

"HPI flow instrumentation is provided for verification and long term monitoring of HPI flow."

"The HPI lines will have preset throttle valves, stop check valves, and cross-tie lines to: 1) create the desired flow distribution through the HPI lines for LOCA core cooling; 2) ensure adequate cooling flow to the HPI pump mechanical seals; and 3) prevent HPI pump flow from exceeding 600 gpm (maximum HPI pump flow rate assumed in design calculations associated with Emergency Diesel Generator loading, ECCS pump available NPSH, and makeup tank (MUT-1) allowable overpressure versus level)."

Information discussing pump runout is being deleted from this section because the HPI system resistance is adequate to prevent pump runout. Information concerning HPI line isolation is also deleted because the addition of the throttle valves eliminates the need for operators to diagnose and isolate a ruptured HPI line.

ITS 3.5.2, Emergency Core Cooling System (ECCS) – Operating Surveillance Requirement (SR) 3.5.2.5 is revised to verify the correct position for valves throttled in the HPI flowpath. These valves include the new HPI throttle valves and any of the existing stop check valves that are throttled. The throttle valves will be used to balance flow between the four HPI lines. The HPI pump discharge stop check valves may be used to reduce flow from the stronger pumps. Equalizing pump flows in this manner facilitates determination of HPI throttle valve position.

The Bases for SR 3.5.2.5 are revised to include information concerning flow resistance and pressure drop across the valves in order to: 1) provide the proper flow split between injection lines in accordance with the analysis assumptions; 2) provide an acceptable level of total ECCS flow to all injection points; 3) ensure adequate cooling flow to the HPI pump mechanical seals; and 4) prevent HPI pump flow from exceeding 600 gpm when the system is in its minimum resistance configuration. 600 gpm is the maximum HPI pump flow rate assumed in design calculations associated with Emergency Diesel Generator loading, ECCS pump available net positive suction head (NPSH), and makeup tank (MUT-1) allowable overpressure versus level.

Please note that page B 3.5-18 is also affected by the changes requested in our submittal for the addition of the diesel driven EFW Pump (FPC to NRC letter, 3F1198-01). The footnote "Note – Valid Until Cycle 12 Only" and the associated text are deleted in that submittal.

The Bases for 3.5.2, Limiting Condition for Operation (LCO), is also revised to delete information pertaining to selecting the backup power supply for the HPI injection valves. While this design feature is being retained, the function and operator action are no longer required for accident mitigation.

Editorial changes are being made to the Bases for 3.5.2 at the top of page B 3.5-13 to more specifically identify the HPI flow path as the portion of the system that is not separable into two distinct trains.

Justification for Proposed ITS Changes

The ESAS Low RCS Pressure setpoint is the only setpoint change that will provide direct analytical and accident mitigation benefits. The other setpoint changes are being requested to maintain the existing relationships between RCS pressure related ESAS and RPS actuations and functions.

Raising the ESAS Low RCS Pressure Setpoint will ensure earlier automatic HPI actuation for a portion of the spectrum of pressure decreasing events. For rapid depressurization events (main steam line break (MSLB) and LBLOCA) this will have little impact. For slower events or those that do not reach the current setpoint during the initial subcooled blowdown phase, HPI will be automatically initiated substantially earlier in the event. This will increase the integrated HPI flow to the RCS during the time the core is likely to be uncovered, thereby reducing the consequential PCT. The PCT reduction will be significant for the smaller SBLOCA scenarios (less than 0.07 square feet). The increased setpoint is an essential complement to the mechanical changes which slightly reduce the integrated HPI flow provided for some portions of the break spectrum as compared to the current operator action based strategies. The revised ESAS setpoint will also provide additional analytical margin that will permit increased Once Through Steam Generator tube plugging.

The RCS Low Pressure reactor trip will be increased to provide comparable margin between the RPS and ESAS setpoints. This change will ensure that a reactor trip will occur before HPI is actuated. The revised reactor trip setpoint is greater than or equal to 1900 psig. A review of industry data showed that there were 352 reactor trips at B&W plants between 1980 and 1997. Eleven of these trips were on RCS low pressure (approximately 3% of all reactor trips). Of these trips, only four might not have occurred with a setpoint of 1800 psig versus 1900 psig (approximately 1% of all reactor trips). Therefore, the increased setpoint is not expected to result in a significant increase in reactor trip frequency.

The Shutdown Bypass RCS High Pressure reactor trip setpoint limit will be increased from 1720 psig to 1820 psig. The Shutdown Bypass high pressure trip is a backup for mitigating shutdown transients and is not credited in the accident analysis. The Shutdown Bypass switch is manually selected to the Shutdown Bypass position during normal cooldown and depressurization to remove a number of trips, including RCS Pressure Low, and replaces them with the Shutdown Bypass RCS Pressure High trip. Operation with Shutdown Bypass selected allows withdrawal of the safety rods to make rapid negative reactivity addition available. The Shutdown Bypass trip is normally selected prior to bypassing the ESAS HPI actuation. The revised ESAS applicability will allow bypassing the HPI ESAS signal below 1800 psig. Therefore, the Shutdown Bypass setpoint is being raised to 1820 psig to ensure the Shutdown Bypass can be selected before the ESAS HPI actuation must be bypassed.

NO SIGNIFICANT HAZARDS EVALUATION:

An evaluation of the proposed license amendment request has been performed according to 10 CFR 50.91(a)(1) regarding significant hazards considerations, using the standards in 10 CFR 50.92(c).

1. *Does not involve a significant increase in the probability or consequences of an accident previously evaluated.*

The setpoint changes for reactor trip and High Pressure Injection (HPI) actuation will result in a very small (approximately one-percent) increase in the probability for reactor trips. Review of industry data shows that this increase is not significant. The revised accident analysis has determined that transients which reduce Reactor Coolant System (RCS) pressure below the new setpoints, warrant the associated action. Engineered Safeguards Actuation System (ESAS) and Reactor Protection System (RPS) actuations are used to mitigate accidents and are not the initiator of analyzed accidents. Therefore, the probability of previously evaluated accidents is not affected.

RPS and ESAS functions are assumed to actuate to mitigate transients. The revised setpoints will ensure earlier actuation of the RPS and ESAS on a low RCS pressure condition. Raising the ESAS Low RCS Pressure Setpoint will ensure earlier automatic HPI actuation for a portion of the spectrum of pressure decreasing events. For rapid depressurization events, such as main steam line break and large break Loss of Coolant Accident (LOCA), this will have little impact. For slower events, or those that do not reach the current setpoint during the initial subcooled blowdown phase, HPI will be automatically initiated substantially earlier in the event. This will increase the integrated HPI flow to the RCS during the time the core is likely to be uncovered, thereby reducing the consequential PCT. This additional flow results in a significant peak clad temperature (PCT) decrease for small break LOCA scenarios less than 0.07 square feet. Based on the above, the consequences of previously evaluated accidents will not be increased.

The HPI system characteristics will not be affected such that the probability of any accident is increased. The system flow restriction for protection from low temperature overpressure (LTOP) events will be maintained. The HPI system is used for accident mitigation and is not the initiator of evaluated accidents other than LTOP. The proposed surveillance changes will ensure that all valves throttled in the HPI flowpath are verified and secured in the correct position. The throttle valves and stop check valves will be positioned to ensure HPI flow is within analyzed limits. Therefore, the consequences of accidents that rely on HPI flow will not be increased.

Based on the above evaluation, the probability or consequences of evaluated accidents are not significantly increased by these changes.

2. *Does not create the possibility of a new or different kind of accident from any accident previously evaluated.*

The change to RPS and ESAS setpoints will not change the functions of plant equipment, no new system interactions will be created, and no new failure modes will be introduced. The setpoint changes will permit earlier actuation for the associated actions. However, no new plant conditions will be introduced by the setpoint changes.

The HPI modifications include the installation of throttle valves that will change the flow characteristics of the system. The new throttle valves are manual valves that will be secured in position. The revised surveillance requirements will ensure these valves are positioned such that HPI flow is within analyzed limits. Therefore, no conditions are created that could cause a new type of accident.

Based on the above evaluation, these changes cannot create the possibility of an accident of a different type than previously evaluated in the SAR.

3. *Does not involve a significant reduction in the margin of safety.*

The safety function of the affected portions of the RPS and ESAS systems is to actuate their respective functions if RCS pressure drops below the setpoint. The raised RPS and ESAS setpoints will provide earlier actuation for these protective features. These changes will increase the margin of safety provided by the associated Technical Specifications.

The safety function of the HPI system is to provide cooling to limit fuel peak clad temperature. The revised surveillance requirements will ensure valves are positioned such that HPI flow is within analyzed limits. Therefore, the margin of safety provided by the HPI surveillance requirements is maintained.

Based on the above evaluation, there is no reduction in the margin of safety associated with the equipment and systems affected by this change.

ENVIRONMENTAL IMPACT EVALUATION:

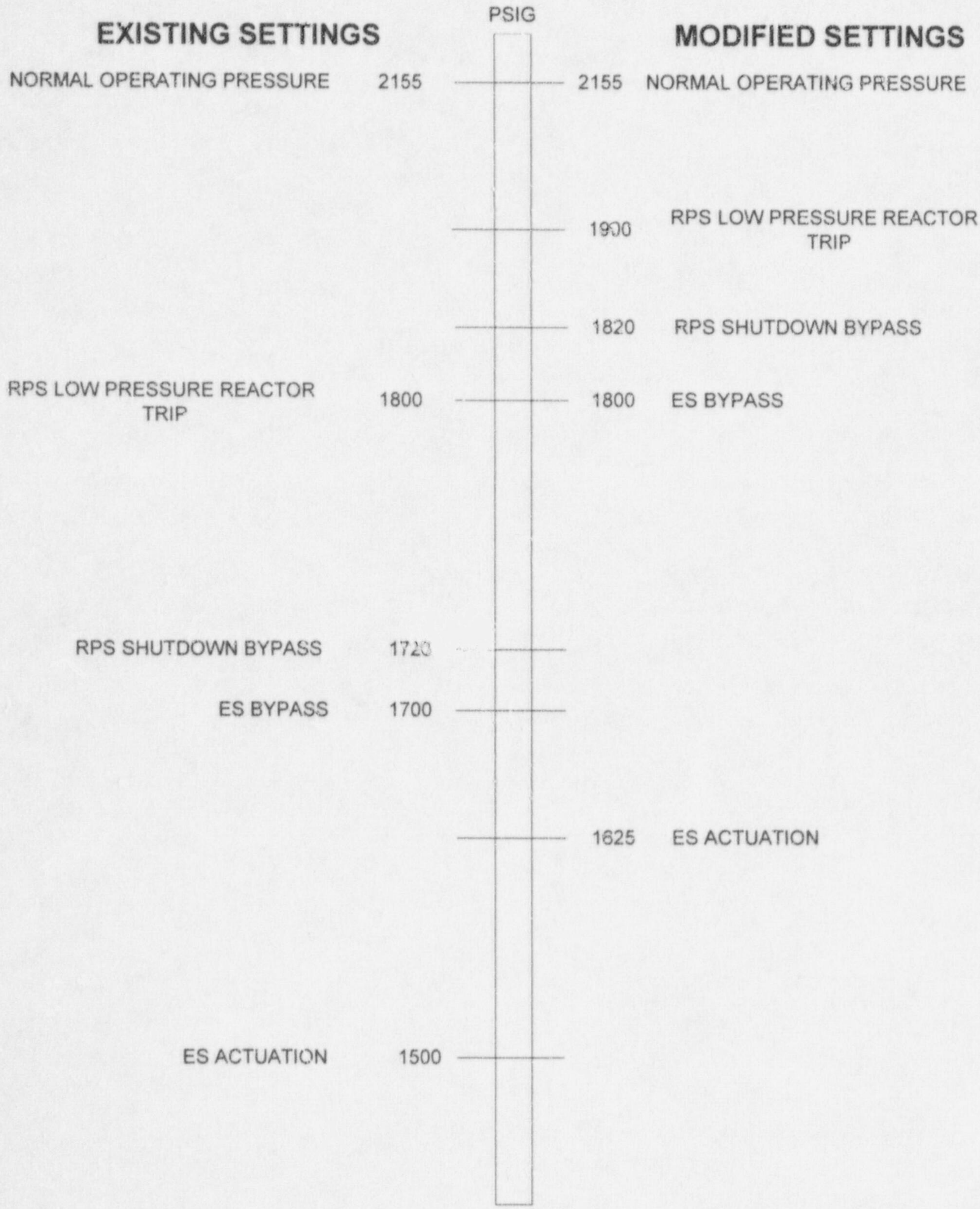
10 CFR 51.22(c)(9) provides criteria for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration, (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released off-site, or (3) result in a significant increase in individual or cumulative occupational radiation exposure. FPC has reviewed this license amendment and has determined that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(c), no environmental impact statement or environmental assessment need to be prepared in connection with the issuance of the proposed license amendment. The basis for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.

2. As discussed in the significant hazards evaluation, this change does not result in a significant change or significant increase in the radiological doses for any Design Basis Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site. FPC has concluded that there will not be a significant increase in the types or amounts of any effluents that may be released off-site and does not involve irreversible environmental consequences beyond those already associated with The Final Environmental Statement.

3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure because this is a change to plant equipment that does not increase interaction with radiologically contaminated systems and does not require operator or other actions that could increase occupational radiation exposure.

Figure 3



HPI MODIFICATION SETPOINT CHANGES