

## Florida Power

CORPORATION  
Crystal River Unit 3  
Docket No. 50-302

June 26, 1997  
3F0697-08

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

Subject: License Condition 2.C.(5) Requiring Installation and Testing of Flow Indicators

Reference: A. NRC to B&W Owner's Group, 3N0393-18, Thadani to Walsh, dated March 9, 1993 (Attached)

Dear Sir:

Pursuant to 10 CFR 50.90, Florida Power Corporation (FPC) hereby submits an application for an amendment to Operating License No. DPR-72, License Condition 2.C.(5) to remove the requirement for: "---, installation and testing of flow indicators in the emergency core cooling system to provide indication of 40 gallons per minute flow for boron dilution, ---" from the license. Approval of this amendment will allow removal of flow indicators DH-45-FI and DH-46-FI as shown on FSAR Figure 9-6 (3 of 3).

The proposed changes have been evaluated in accordance with 10 CFR 50.91(a)(1) using the criteria of 10 CFR 50.92(c). FPC has determined that this license amendment involves no significant hazard considerations. The basis for this determination is included in the attachment.

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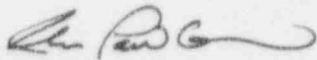
CRYSTAL RIVER ENERGY COMPLEX: 15760 W Power Line St. • Crystal River, Florida 34428-6708 • (352) 795-6486  
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FPC requests the effective implementation date for this amendment to be immediate upon approval. We request approval of this amendment by September 26, 1997 to support the Crystal River Unit 3 restart schedule.

Sincerely,



John Paul Cowan  
Vice President  
Nuclear Production

JPC/jwt/gmv

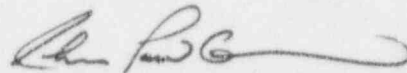
Attachments

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

STATE OF FLORIDA

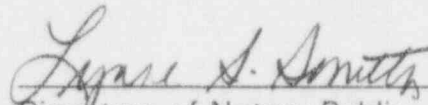
COUNTY OF CITRUS

John Paul Cowan states that he is the Vice President Nuclear Production 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 Paul Cowan  
Vice President  
Nuclear Production

Sworn to and subscribed before me this 26<sup>th</sup> day of June, 1997, by  
John Paul Cowan, who is personally known to me.



Signature of Notary Public  
State of Florida

Stamp Commissioned Name  
of Notary Public



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

**LICENSE DOCUMENT INVOLVED:**

Operating License Condition 2.C.(5), "Within six months of issuance of this license, Florida Power Corporation shall complete modifications to the level indication of the borated water storage tank, installation and testing of flow indicators in the emergency core cooling system to provide indication of 40 gallons per minute flow for boron dilution, and installation of dual setpoint pilot-operated relief valve on the pressurizer."

**DESCRIPTION OF REQUEST:**

Florida Power Corporation (FPC) requests that the requirement for "flow indicators in the emergency core cooling system to provide indication of 40 gallons per minute flow for boron dilution" as established in License Condition 2.C.(5) be removed as a condition of operation. License Condition 2.C.(5) will thereafter read, "Within six months of issuance of this license, Florida Power Corporation shall complete modifications to the level indication of the borated water storage tank and installation of dual setpoint pilot-operated relief valve on the pressurizer."

**REASON FOR REQUEST:**

FPC has evaluated the need for the flow indicators (designated as DH-45-FI and DH-46-FI) on the Decay Heat Removal (DH) System drop line and auxiliary pressurizer spray line respectively and determined that they are no longer required. These indicators were originally installed in 1977 to satisfy License Condition 2.C.(5), requiring FPC to provide indication of 40 gallons per minute flow for boron dilution. These indicators originally would have provided the operator information necessary to aid in post-accident decision making associated with prevention of boron precipitation. Subsequent evaluation<sup>1</sup> resulted in changes to the design and licensing basis<sup>2</sup> for the auxiliary pressurizer spray and DH drop line for boron

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<sup>1</sup> B&WOG to NRC, Letter # JHT/91-186, Dated November 7, 1991

<sup>2</sup> CR-3 FSAR, Section 4.3.10.1

precipitation mitigation. The design and licensing basis no longer require decision making on the part of the operator because the alternate "backup" method for prevention of boron precipitation during post-accident conditions is the reactor vessel internals gap flow method which is passive in nature. Therefore, operator action does not rely upon verification of flow, so the flow indicators are no longer necessary. Elimination of the requirement for flow indication from License Condition 2.C.(5) of the license is necessary to abandon or physically remove the indicators from the plant. This submittal will show that DH-45-FI and DH-46-FI are no longer required for mitigation of design basis accidents, and removal of the requested portion of License Condition 2.C.(5) related to flow indication is appropriate.

#### **EVALUATION OF REQUEST:**

At the time the subject license condition was imposed, the Crystal River Unit 3 (CR-3) licensing basis for boron precipitation prevention was based upon the Babcock and Wilcox (B&W) Topical Report, BAW-10103, "ECCS Analysis of B&W's Lowered-Loop NSS." Section 10.3 of BAW-10103 documented three active methods of boron precipitation prevention. Two of the active methods required the DH System drop line which is connected to the Reactor Coolant System (RCS) hot leg, and the third required auxiliary pressurizer spray from the DH System. At the time the CR-3 operating license was issued, the auxiliary pressurizer spray line and DH drop line did not have flow indication. Therefore, License Condition 2.C.(5) was added to the operating license (OL) to ensure installation of these indicators within six months after issuance of the OL. Installation of these flow indicators originally would have provided flow indication during post-accident conditions to aid the operator in decision making relative to the need for an alternate flow path for boron precipitation mitigation. For example, if flow through the drop line was unavailable because of a single failure, then auxiliary pressurizer spray would be initiated. Flow indication, (or lack thereof) to aid in decision making during recirculation through the core was the sole function of the subject indicators.

Strategies to preclude post-LOCA boron precipitation in the reactor vessel have evolved since the initial license condition was imposed in 1976.<sup>3</sup> The licensing basis has been changed to exclude the auxiliary pressurizer spray method because

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<sup>3</sup> B&WOG to NRC, Letter # JHT/91-186, Dated November 7, 1991

it was determined that it would not be effective under all postulated conditions.<sup>4</sup> Reactor vessel internals gap flow was evaluated and determined to be an effective mitigation method and was determined to be an acceptable backup method. This change was accepted by the NRC in Reference A, a copy of which is attached. Gap flow is a passive method providing dilution flow through the gaps between the reactor vessel and internals and requires no operator diagnosis or action.

Based upon gap flow being a backup method, the current licensing basis (as described in Section 4.3.10.1 of the CR-3 Final Safety Analysis Report) documents two methods of preventing boron precipitation, one active and one passive. The active method is gravity flow through the drop line to the Reactor Building sump with recirculation back to the reactor core through the Low Pressure Injection (LPI) pumps. The passive method is the gap flow. FPC has demonstrated by analysis that, if the DH drop line were open, the minimum accident condition flow rate through the drop line would be in excess of 2000 gpm prior to throttling the LPI pump flow. After throttling, the flow would approximate LPI pump flow minus core boil-off. 2000 gpm is 50 times the minimum flow rate required to prevent boron precipitation. Under the current licensing basis, if the drop line is open, boron precipitation will be prevented by the primary method of mitigation. If it is not open for any reason, boron precipitation will be prevented by the alternate "backup" method of mitigation -- reactor vessel internals gap flow. Neither condition requires the use of the subject flow indicators since no further mitigating action can be taken by the operator.

After approval of this request, FPC will abandon or remove the flow indicators from the DH System drop line and auxiliary pressurizer spray line and will delete the requirement for them from the design basis.

#### **DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION:**

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

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<sup>4</sup> CR-3 FSAR, Section 4.3.10.1



### Criterion 1

*The change does not involve a significant increase in the probability or consequences of an accident previously evaluated.*

This license amendment removes the requirement for flow indication on the DH drop line and auxiliary pressurizer spray line for boron precipitation mitigation during a LOCA. The original need for these indicators was to provide flow indication to the operator to aid in decision making relative to an alternate active method for boron precipitation prevention. Alternate active methods have been replaced by the passive flow path through the gaps which exist between the reactor vessel and the reactor vessel internals. Since auxiliary pressurizer spray flow is no longer used, and no other active means is required to be employed by the operator in the event drop line flow is not indicated, the original usefulness of and need for this indication no longer exists. Removal of this requirement from the license condition does not involve a change in the Improved Technical Specifications. The operators do not use the flow indication for decision making in post-accident conditions. Since these instruments are no longer used for boron precipitation mitigation during a LOCA, abandonment or removal of flow indicator DH-45-FI and DH-46-FI does not increase the probability of an accident because no previously evaluated accidents at CR-3 are initiated by DH-45-FI or DH-46-FI. Those CR-3 accidents that are analyzed are contained in the Final Safety Analysis Report (FSAR) and include events such as Loss-of-Coolant Accidents, Main Steam Line Breaks, Station Blackout, Anticipated Transients Without Scram, etc. Since DH-45-FI and DH-46-FI are attached to the outside of the DH drop line and auxiliary pressurizer spray line, their removal will not change the design, material, or construction standards applicable to the DH System piping. The removal of the indicator will not affect overall system performance of the ECCS. All of these previously evaluated accidents described in the CR-3 FSAR have dose consequences which remain well within the requirements of 10 CFR Part 100 (25 rem whole body, 300 rem thyroid) and GDC 19 (5 rem whole body, or its equivalent to any part of the body). Removal of DH-45-FI and DH-46-FI will not alter any assumptions made in evaluating the radiological consequences of any accident described in the FSAR nor will it affect any fission product barriers since the ECCS and containment systems will still perform to meet design requirements. Therefore, removal of DH-45-FI and DH-46-FI will not alter the consequences of an accident previously evaluated.

## Criterion 2

*The change does not create the possibility of a new or different kind of accident from any accident previously evaluated.*

The proposed license amendment removes the requirement for indicators which were originally installed to aid the operator in decision making relative to an alternate flow path for boron precipitation mitigation during a LOCA. These indicators no longer serve this purpose, since alternate active flow paths are no longer considered. Evaluations which consider boron precipitation no longer rely on three active methods of mitigation, but rather one active and one passive. Operator action is not required to effect the backup method in the event that the primary method fails due to a single active failure. The flow indicators are external to the DH System piping. They do not penetrate any piping so their removal cannot create the possibility of a new or different kind of accident. The accident mitigation strategies remain the same regardless of whether or not the flow indicators are present. Therefore, the flow indicators serve no purpose in the analyses. The proposed amendment does not affect any of the parameters or conditions that could contribute to the initiation of any accidents.

## Criterion 3

*The change does not involve a significant reduction in the margin of safety.*

Boron precipitation within the reactor vessel during post-LOCA conditions, if it were to occur, would challenge the margin of safety that is provided by assuring compliance with Criterion 5 of 10 CFR 50.46. The license amendment does not change the methodology of mitigating the consequences of boron precipitation following a LOCA as described in the current licensing basis. The primary method of flow through the DH drop line and the use of gap flow as the "backup" method for prevention of boron precipitation have been analyzed, shown to meet all the criteria of 10 CFR 50.46, and accepted by the NRC. The passive method requires no specific operator action for initiation, in the event that the primary method fails due to a single active failure. Therefore, the indication serves no safety function and does not involve a significant reduction in the margin of safety.



#### **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 an increase in individual or cumulative occupational radiation exposure. FPC has reviewed this license amendment and 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 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 significant hazards consideration evaluation.
2. 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. The proposed license amendment does not introduce any new equipment, does not require any existing equipment or systems to perform a different type of function than they are presently designed to perform, nor does it require any new operator actions. 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 increase the individual or cumulative occupational radiation exposure because no additional operator action is required to implement the amendment. Deletion of the flow instrument license requirement will reduce maintenance on the instrument, hence reducing cumulative occupational radiation exposure.