

**Florida  
Power**  
CORPORATION

March 27, 1986  
3F0386-11

Director of Nuclear Reactor Regulation  
Attention: Mr. John F. Stolz, Chief  
Operating Reactors Branch #4  
Division of Licensing  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: Crystal River Unit 3  
Docket No. 50-302  
Operating License No. DPR-72  
NUREG-0737, Supplement 1  
Regulatory Guide 1.97

Dear Sir:

Nuclear Regulatory Commission (NRC) letter dated October 24, 1985 (3N1085-12) requested additional information to support Florida Power Corporation's (FPC) justification for six (6) exceptions to Regulatory Guide 1.97 items previously submitted. FPC provided partial responses to the six (6) items in letter dated November 15, 1985 (3F1185-17), and stated additional responses would be submitted by April 1, 1986. This letter provides the additional responses stated in FPC letter dated November 15, 1985 (3F1185-17).

Item 1 Pressurizer Level - the licensee should provide additional analyses to support the deviation from the recommended range (Section 3.3.10).

Response 1 The B&W Owners Group (BWO) response has been received, and FPC has reviewed the BWO response and concurs. Compliance Table, page 26, has been revised in accordance with the BWO response, and a copy (Attachment 1) is attached.

Item 2 Pressurizer heater status - the licensee should provide the instrumentation recommended by Regulatory Guide 1.97 (Section 3.3.11).

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Response 2 The BWOg response has been received. FPC has reviewed the BWOg response and concurs. Compliance Table, page 27, has been revised in accordance with the BWOg response, and a copy (Attachment 2) is attached.

Item 3 Safety/relief valve positions or main steam flow - the licensee should install instrumentation to monitor safety/relief valve position or main steam flow (3.3.14).

Response 3 On re-examining our position on "Main Steam Safety/Relief Valve Position", FPC plans to install monitoring instrumentation to comply with the requirements of Regulatory Guide 1.97, Rev. 3. A revised copy of page 33 (Attachment 3) is attached. Please note that the schedule for installation of this instrumentation is Refuel 7 outage, December 1989.

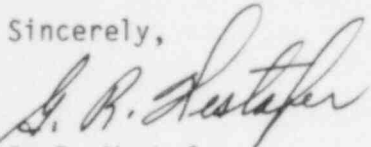
Item 4 No further response required.

Item 5 No further response required.

Item 6 Noble gas from the steam generator safety/relief valves for atmospheric dump valves - the licensee should provide additional justification for this deviation (Section 3.3.22).

Response 6 Two of the four main steam line monitors, namely RM-G25 and RM-G28, are presently being relocated to monitor discharge of the atmospheric dump valves. A revised copy of page 47 (Attachment 4) is attached. In FPC letter dated November 19, 1985 (3F1185-22), we stated that the completion schedule was March 31, 1986. Due to the recent late delivery of the required calibration cables, the completion date for installation and calibration is June 1, 1986.

Sincerely,



G. R. Westafer  
Manager, Nuclear Operations  
Licensing and Fuel Management

EMG/feb

CRYSTAL RIVER 3

REGULATORY GUIDE 1.97  
COMPLIANCE TABLE

VARIABLE: Pressurizer Level

TYPE & CATEGORY: D 1

RANGE: CR-3 0-320 inches, see position  
NRC Top to bottom

ENVIRONMENTAL  
QUALIFICATION: No, will comply

SEISMIC  
QUALIFICATION: No, will comply

QUALITY ASSURANCE: No, will comply

REDUNDACY: No, will comply  
2 channels

POWER SOURCE: 1E/DG

DISPLAY: Indicated and recorded in CR  
On demand in TSC & EOF

SCHEDULE: New transmitter will be installed by end of Refuel V.  
Other upgrades to be complete by end of Refuel VI.

POSITION:

The following position is a justification developed by the BWOg Reg. Guide 1.97 Task Force.

The pressurizer level was sized based on the following. The water volume is chosen such that the reactor coolant system can experience a reactor trip from full power without uncovering the level sensors in the lower shell and to maintain system pressure above the HPI system actuation setpoint. The steam volume is chosen such that the reactor coolant system can experience a turbine trip without covering the level sensors in the upper shell. The range of 0-320" H<sub>2</sub>O was based on this criteria and setpoints for automatic or manual actions are based on this range.

The pressurizer is approximately 512 inches tall. The 0 inch reference for the pressurizer level instrument range is 43 inches above the lower datum line (approx. 96 inches from the bottom), 16 inches below the upper set of heaters, and approximately at the level of the second set of heaters. The upper pressurizer level top (320 inches above the 0 inch reference) is 43 inches below the upper datum (approx. 92 inches from the top), and approximately 37 inches from the spray head.

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The Accident Analysis chapters of several B&W Owners Group Utility Final Safety Analysis Reports (SAR), as well as Part II, Volume 2 of the B&W Owners Group Abnormal Transient Operating Guidelines (ATOG) were reviewed to obtain pressurizer level responses to anticipated transients and accidents.

For anticipated transients such as decreasing feedwater temperature, excessive main feedwater flow, loss of main feedwater flow, decreasing steam flow, small steam leaks, loss of external load, loss of off-site power, loss of condenser vacuum and small steam generator tube leaks, the existing ranges for the pressurizer level are sufficient such that indicated level should remain on-scale.

For severe transients (accidents) such as steam line break, steam generator tube rupture and many small break LOCAs, the pressurizer voids. Following SFAS actuation of the HPI system, actions can be taken as necessary to stabilize the plant. Those actions are based on subcooling margin and RCS pressure, not pressurizer level. For the case of a total loss of feedwater, the pressurizer will go solid unless either main or emergency feedwater is restored to the steam generators within about 15 minutes. Actions taken are dependent on when feedwater is restored, subcooling margin and RCS pressure, not pressurizer level.

In general, for severe transients or accidents, the pressurizer will either void or go solid. A voided pressurizer will cause indicated level to go off-scale low followed by a rapid decrease in RCS pressure to saturation. A solid pressurizer will cause indicated level to go off-scale high accompanied by high RCS pressure, possible large and rapid changes in RCS pressure, PORV and pressurizer safety valve actuation. All of these indications are available in the control room.

Based on this information, the existing ranges of pressurizer level indication are sufficient for anticipated transients. For severe transients or accidents, indicated pressurizer level will go off-scale high or low due to the pressurizer going solid or voiding and, as a result, top to bottom instruments would provide no significant additional information. In these cases, subcooling margin, RCS pressure, PORV status and pressurizer safety valve status are monitored to determine actions to be taken.

CRYSTAL RIVER 3

REGULATORY GUIDE 1.97  
COMPLIANCE TABLE

VARIABLE:	Pressurizer Heater Status
TYPE & CATEGORY:	D 2
RANGE:	CR-3 On-off lights, see Position NRC Electric Current
ENVIRONMENTAL QUALIFICATION:	No, will comply
SEISMIC QUALIFICATION:	No, not required
QUALITY ASSURANCE:	No, will comply
REDUNDANCY:	No, not required
POWER SOURCE:	No, not required
DISPLAY:	On-off heater lights in CR, will comply SCR failure alarm in CR Group overcurrent alarms in CR Breaker open alarms in CR
SCHEDULE:	Upgrades will be complete by end of Refuel VI
POSITION:	

The following position is a justification developed by the BWOG Reg. Guide 1.97 Task Force.

Pressurizer heater control utilizes several banks of heaters including redundant, 126 kW banks of emergency pressurizer heaters which are controlled in an on-off mode and one bank of heaters which is modulated to produce a proportional output that increases as pressure decreases from setpoint. Since the control of the two emergency pressurizer heater banks is either "on" or "off" and not by modulating the current to them, an on-off indication of the heater status is appropriate. RCS pressure can be monitored to determine the effectiveness of the heaters to maintain system pressure.

#### Regarding Diesel Loading

For loading the emergency heaters onto the diesels, the operator has indication of existing loads on the diesels in order to determine whether he can load the heaters without overloading the diesels. Once he has loaded the heaters onto the diesels, then the operator has indications including heater overcurrent alarms, breaker status and breaker alarms in addition to or in lieu of heater current indication for information to prevent continued overloading of the diesels.

#### Regarding Technical Specifications

Technical specifications applicable to B&W-designed plants do not in general require the measurement of pressurizer heater current. The CR-3 Standard Technical Specification 3.4.4.C requires that at least 126 kW of pressurizer heaters be available in order that the pressurizer be operable. Surveillance Specification 4.4.4.2 states that the emergency power supply for pressurizer heaters shall be demonstrated operable at least once per 18 months by manually transferring power from the normal to the emergency power supply and energizing the heaters. There is no requirement that emergency pressurizer heater current be measured quarterly. Should measurements be performed by the utility as part of its surveillance procedure on the pressurizer heaters, there is no requirement that the current flow be measured using instrumentation in the control room available to the operator for post-accident monitoring. Many other types of instrumentation are available for such measurement.

## CRYSTAL RIVER 3

REGULATORY GUIDE 1.97  
COMPLIANCE TABLE

VARIABLE: Main Steam Safety Relief Valve Position

TYPE &amp; CATEGORY: D 2

RANGE: CR-3 Closed - not closed  
NRC Closed - not closedENVIRONMENTAL  
QUALIFICATION: Yes, will complySEISMIC  
QUALIFICATION: No, not required

QUALITY ASSURANCE: Yes, will comply

REDUNDANCY: No, not required

POWER SOURCE: UPS/DG

DISPLAY: Indicated in Control Room

SCHEDULE: Refuel 7, December 1989

POSITION:

Equipment will be installed to indicate Main Steam Safety Relief Valve Position.

The installation will include equipment to establish the magnitude of release of radioactive material from the secondary coolant system during accident conditions.



## CRYSTAL RIVER 3

REGULATORY GUIDE 1.97  
COMPLIANCE TABLE

VARIABLE: Vent from Safety Valves or Atmospheric Dump Valves  
(Main Steam Line Radiation Monitor) - See position.

TYPE & CATEGORY: E 2

RANGE: CR-3  $10^{-2}$  to  $10^3$   $\mu\text{ci/cc}$  Xe-133  
NRC  $10^{-1}$  to  $10^3$   $\mu\text{ci/cc}$  (and duration of release in  
second mass of steam per unit time).

ENVIRONMENTAL  
QUALIFICATION: Yes, see position.

SEISMIC  
QUALIFICATION: No, not required.

QUALITY ASSURANCE: Yes, see position.

REDUNDANCY: No, not required.  
1 each atmospheric dump valve

POWER SOURCE: 1E/Battery Backed

DISPLAY: Indicated in CR, recorded on demand

SCHEDULE: Completed by June 1, 1986

POSITION:

The four 24" main steam headers contain a total of 16 relief valves and 2 atmospheric dump valves. Each atmospheric dump valve discharge will be monitored for radiation by monitors with readouts in the Control Room. The system will be calibrated in terms of  $\mu\text{ci/cc}$  Xe-133 in order to comply with NUREG-0737.

Refer to the position on item 33 (page 33) for an evaluation of duration of release and mass of steam per unit time.

This variable is only used during a S.G. tube rupture type accident. The results of this accident do not create a harsh environment, therefore they meet the environmental qualifications for the normal environment.