



**Florida
Power**
CORPORATION

September 17, 1979

File: 3-0-3-a-4

Mr. J. P. O'Reilly
Director
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Suite 3100
101 Marietta Street
Atlanta, Ga 30303

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
I.E. Bulletin 79-21

Dear Mr. O'Reilly:

Enclosed is our response to I.E. Bulletin 79-21.

Please contact this office if you require any additional discussion concerning our response.

Very truly yours,

FLORIDA POWER CORPORATION

W. P. Stewart
Manager, Nuclear Operations

WPSemhD77

cc: Director
Division of Operating Reactors
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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IE BULLETIN 79-21 RESPONSE
FOR ALL PRESSURIZED WATER REACTOR FACILITIES WITH AN OPERATING LICENSE

1. Review the liquid level measuring systems within containment to determine if the signals are used to initiate safety actions or are used to provide post-accident monitoring information. Provide a description of systems that are so employed; a description of the type of reference leg shall be included, i.e., open column or sealed reference leg.

RESPONSE:

B&W Level Instrumentation

The liquid level measuring systems for the steam generator, pressurizer and core flood tank have been examined. No safety actions are initiated by these measuring systems. These measuring systems are of the delta pressure, open column, uninsulated reference leg type with the exception of the core flood tank level. The core flood tank level has a dry reference leg that is not affected by the containment environment.

The pressurizer water level is monitored to provide an indication of reactor coolant inventory and to control the makeup. The core flood tank water level is monitored to provide an indication of an adequate supply of water as required by Tech Specs. The steam generator water level is monitored to provide an indication and a control of the steam generator water inventory below 15% power. The level is monitored in three ranges; "Start-up", "Operating" and "Full Range."

Non-B&W Level Instrumentation

WD-26-LT & WD-222-LT - RB Sump Level Transmitters: These measurements are important for leakage detection, LPI recirculation to the DH and BS systems, and post accident monitoring. These devices consist of displacer (float) activated torque tube, and, therefore, have no reference leg subject to the problem described in IE No. 79-21.

WD-131-LS - Reactor Building Sump Level Switch: This device is a Magnetrol float/magnetic switch mechanism used for alarm and sump pump control. Since these functions are not safety-related and the devices do not have reference legs, they are not subject to the problem described in IE Bulletin No. 79-21.

WD-23-LT - RC Drain Tank Level Transmitter & WD-214-LS - RC Drain Tank Level Switch: These instruments both have Barton differential pressure measuring elements and share common impulse tubing lines. The reference leg is dry and measures the nitrogen pressure on top of the tank. Neither instrument performs a safety function nor is used for post-accident monitoring, therefore is not subject to the problem described in IE Bulletin No. 79-21.

2. On those systems described in Item 1 above, evaluate the effect of post-accident ambient temperatures on the indicated water level to determine any change in indicated level relative to actual water level. This evaluation must include other sources of error including the effects of varying fluid pressure and flashing of reference leg to steam on the water level measurement. The results of this evaluation should be presented in a tabular form similar to Tables 1 and 2 of Enclosure 1.

RESPONSE:

The effect of the reference leg temperature on the B&W level measurement instrumentation systems identified above is listed in Tables 1 and 2. The errors listed have been maximized to account for varying fluid pressures and are applicable to all B&W operating plants.

Consideration has been given to boiling in the reference leg and the ejection of water from the reference leg due to the effervescence of soluble gases. These effects will be discussed for each component employing a water reference leg.

Steam generator level measurements are not significantly affected by the effervescence of soluble gases because there is insufficient soluble gas in the secondary system. For boiling to occur in the steam generator reference leg, the reference leg must experience high temperatures and almost complete depressurization. The repressurization of the steam generator will refill the reference leg and the errors would be no greater than those listed in the tables.

The pressurizer level could be affected by the effervescence of soluble gases. The ejection of water from a reference leg has been documented in BW-4689 and previously discussed with the NRC. A depressurization from 2000 to 1000 psi will cause an error of approximately 1%. Larger errors can exist for rapid depressurization to less than 600 psi, but under these conditions, pressurizer level is unimportant. However, supplementary instructions will be provided to make the operator aware of the possibility of pressurizer level indication errors following a rapid depressurization to pressures less than 600 psi. For boiling to occur in the reference leg, the system pressure must be below 300 psi and therefore need not be considered as discussed above.

TABLE 1

Correction to indicated water level for post-accident temperature effects of the steam generator operate level, steam generator full range level, pressurizer level and core flood tank level (for tanks with water reference legs).

<u>Reference Leg Temperature (°F)</u>	<u>Correction to Indicated Level (%) of Full Span</u>
100	2.0
150	3.0
200	5.0
250	7.0
300	9.0
350	12.0
400	15.0

NOTE: The increase in reference leg temperature causes the measured level to indicate higher than actual level.

TABLE 2

Correction to indicated water level for post-accident temperature effects of the steam generator start-up level.

<u>Reference Leg Temperature (°F)</u>	<u>Correction to Indicated Level (%) of Full Span</u>
100	2.0
150	3.0
200	5.0
250	8.5
300	12.0
350	16.5
400	21.0

NOTE: The increase in reference leg temperature causes the measured level to indicate higher than actual level.

3. Review all safety and control setpoints derived from level signals to verify that the setpoints will initiate the action required by the plant safety analyses throughout the range of ambient temperatures encountered by the instrumentation, including accident temperatures. Provide a listing of these setpoints.

RESPONSE:

No reactor protection system actions are initiated by these instruments; therefore, the error induced by the increase in the reference leg temperature need only be considered for post-accident monitoring. During post-accident monitoring, level indication alone is not relied upon but rather system temperature and pressures are used to assure adequate core cooling and to confirm the adequacy of the level indications.

Although not related to RPS actions, the pressurizer level instrumentation is used to deenergize the pressurizer heaters and therefore this action may have to be taken manually in the event of elevated containment temperatures. The low level pressurizer heater cutout is 40 inches.

If the above reviews and evaluations require a revision of setpoints to ensure safe operation, provide a description of the corrective action and the date the action was completed. If any corrective action is temporary, submit a description of the proposed final corrective action and a timetable for implementation.

RESPONSE:

The reviews and evaluations performed per Items 1, 2, and 3 of IE Bulletin No. 79-21 show that a revision of the setpoints is not required to ensure safe operation.

4. Review and revise, as necessary, emergency procedures to include specific information obtained from the review and evaluation of Items 1, 2, and 3 to ensure that the operators are instructed on the potential for and magnitude of erroneous level signals. All tables, curves, or correction factors that would be applied to post-accident monitors should be readily available to the operator. If revisions to procedures are required, provide a completion date for the revisions and a completion date for operator training on the revisions.

RESPONSE:

B&W is preparing site instructions to deal with the general matter of level indication involving post-accident monitors under adverse environments. As soon as these instructions are received at Crystal River Unit 3 they will be incorporated in the emergency procedure and the operators will receive training on the revised procedures.

The procedure revisions and the operator training will be completed within five weeks of receipt of site instructions from B&W.

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