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SUBJECT: LTR 3 ENCL 3
SUBMITTAL OF BASES FOR POWER OPERATED RELIEF VALVES AND TESTING FREQUENCY.

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FLORIDA POWER & LIGHT COMPANY

June 29, 1978
L-78-223

Office of Nuclear Reactor Regulation
Attention: Mr. R. W. Reid, Chief
Operating Reactors Branch #2
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Reid:

Re: Overpressure Mitigating System
Technical Specifications
St. Lucie Unit 1
Docket No. 50-335

Florida Power & Light Company (FPL) submitted proposed technical specifications for the St. Lucie Unit 1 Overpressure Mitigating System (OMS) to the NRC by letter dated April 13, 1978 (L-78-129). The NRC staff has developed Standard Technical Specifications for the OMS which have formed the basis of discussions between the staff and FPL concerning the system's Limiting Conditions for Operation and Surveillance Requirements.

During recent conversations with NRC staff reviewers, FPL was requested to provide its position and bases concerning testing of Power Operated Relief Valves at St. Lucie Unit 1. The requested information is attached.

Very truly yours,

Robert E. Uhrig

Robert E. Uhrig
Vice President

REU:MAS:sl
Attachment

cc: Mr. James P. O'Reilly, Region II
Harold F. Reis, Esquire

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FPL BASES FOR PORV TESTING

FPL had proposed to test the pressurizer Power Operated Relief Valves (PORV's) at St. Lucie Unit 1 once per five years in accordance with ASME Section XI requirements. The NRC staff proposed technical specifications for the St. Lucie 1 Overpressure Mitigating System which would have required testing of these valves once per 18 months. During recent conversations with NRC staff reviewers FPL was requested to provide its position and bases concerning its proposed St. Lucie Unit 1 testing frequency for the PORV's.

The proposed NRC Standard Technical Specifications for Overpressure Mitigating Systems generically recommend a full stroke valve testing frequency of once per 18 months for pressurizer relief valves. For nuclear plants that have air or motor-operated pressurizer relief valves this proposed full stroke testing frequency is readily achievable during a refueling outage. Additionally, since this type of PORV can be tested under non-steam conditions there is no potential for valve seat scoring and no "real world" unit operational problems in the event of improper valve closure or reseating alignment.

In the case of St. Lucie Unit No. 1, however, the pressurizer PORV's are pilot-operated self-actuating valves and therefore require different test conditions in order to fully stroke the relief valve. The power-operated portion of the valve is a solenoid-operated pilot valve which vents system pressure from a plenum located on the upstream side of the relief valve disk. The relief valve itself is self-actuating and therefore requires system pressure to stroke.

Thus, either pressurizer steam must be used as the working fluid for stroking the valves, or the valve must be removed from the pressurizer and stroked on a test stand in order to demonstrate operability as the NRC has requested.

To adequately test the operability of the PORV's with the valves installed on the system, a large steam bubble would be required in the pressurizer, system pressure would have to be greater than 200 psig, and the isolation valves must be open. These conditions are dictated by the following considerations:

1. The valve manufacturer has indicated that a system pressure of approximately 200 psi is required to overcome spring force and lift the disk from the seat.

2. A large steam bubble would be required in the pressurizer to avoid a rapid depressurization of the RCS when the valve is opened.

3. The volume of steam that would be trapped between the PORV and a closed isolation valve is approximately 0.15 $ft.^3$ FPL does not believe that valve operation can be verified in the installed condition with this available volume of steam.

Florida Power and Light does not consider testing the PORV's under the above conditions and at a frequency of once per 18 months to be appropriate. <u>In situ</u> testing of the PORV's is potentially damaging to the valve, much more so than

testing a valve under laboratory conditions. A system pressure in excess of 200 psig will result in substantial flow through the valve. Stroking the PORV's under these conditions increases the potential for valve seat scoring and leakage on the self-actuating relief valve and on the pilot valve. Typically, even minor relief valve seat leakage is sufficient to cause additional steam cutting of the valve seat, hence increasing the required maintenance/repair of the valve and potentially affecting the availability of the unit. Additionally, leakage through the pilot valve could cause the self-actuating valve to open at pressures below the established setpoint. Spurious opening of a PORV is an undesirable event during any mode of unit operation since a reduction in unit availability will likely occur.

Removal and bench testing the PORV's during a refueling outage would significantly reduce the potential for valve seat damage. This test method is not without drawbacks, however, since it would: 1) increase worker radiation exposure, 2) likely require valve decontamination prior to testing and 3) potentially affect the outage duration. Following re-installation of the valves, valve flange gasket integrity could not be assured until the unit is pressurized during startup. Flange leakage at this time could require unit depressurization for repair which would directly impact unit availability. These considerations would militate against bench testing during each refueling outage.

It should be noted here that the standard for testing safety valves and relief valves is provided by the ASME code, Section XI, Article IWV-3500. The code

recognizes that system pressure is required for self-actuating valve testing and recommends a minimum test frequency of once per 60 months.

The testing program proposed by FPL treats this valve as a hybrid valve, both solenoid-operated and self-actuating, consistent with its design features. We proposed channel calibration and full stroke testing of the solenoid-operated pilot valve once per 18 months. This assures that demand for valve operation will be generated at the proper setpoint and that the solenoid will operate on demand. We proposed to test the self-actuating portion of the valve for operability in accordance with the schedule provided in Table IWV-3510-1 of ASME Section XI, 1977 edition, for Category C (self-actuating) valves. This test for operability is in excess of the requirements of Article IWV-3500 for Category C valves which requires testing of setpoints only.

These test frequencies meet established self-actuating valve test recommendations and provide additional assurance of valve operability for the pilot valves while minimizing the potential for unit operational problems and valve maintenance problems. This, coupled with the fact that the Overpressure Mitigating System is designed to accommodate a single failure of a pressurizer relief valve, provides sufficient protection against postulated overpressure events.