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U.S. NUCLEAR REGULATORY COMMISSION

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TO: MR V STELLO

FROM: FLORIDA POWER & LIGHT CO MIAMI, FLA
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DESCRIPTION

LTR RE THEIR 4-1-76 SUBMITTAL.......FURNISHING ADD'L INFO TO CLARIFY POWER ASCENSION TESTING AT THE ST LUCIE PLANT

PLANT NAME: ST LUCIE #1......

ENCLOSURE

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CONTROL NUMBER

4272

P. O. BOX 013100, MIAMI, FLORIDA 33101

FLORIDA POWER & LIGHT COMPANY

April 26, 1976
L-76-171

Director of Nuclear Reactor Regulation
Attention: Mr. Victor Stello, Director
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Stello:

Re: St. Lucie Plant
Docket No. 50-335
<u>Power Ascension Testing</u>

This letter is to clarify and augment our letter of April 1, 1976, and demonstrate how our power ascension test program meets the intent of Reg. Guide 1.68 Appendix A, Section D.1.c, "demonstrate plant response to load swings, including response to automatic dispatcher control, if applicable (50% and 100%)" and Section D.1.d, "demonstrate automatic control system checkout - steam generator level control, automatic rod control, turbine control (25%)."

Please note the following points given in our April 1, 1976 letter and more fully described herein:

1) Automatic dispatcher control is not applicable to St. Lucie Unit 1.

2) During the initial ascent to power, data will be taken (at least) every four hours per test 0010180. Throughout this entire period of ascension this data will be thoroughly evaluated and adjustments/tuning/modifications, if needed, will be made to optimize safe operation of the various control systems. This will be discussed at greater length later in this letter.

3) Preoperational test 1400084, will be performed with the Reactor Regulating System, Turbine Control System, Steam Generator Feedwater Control System, Pressurizer Level and Pressure Control System and Steam Bypass Control System in the automatic mode of operation. This test includes 4 small load changes (about 2%) followed by six 10% load swings (decrease and increase constitute one swing) at each of three power levels (25%, 50% and 90%). Also there will be an additional 10% turbine load runback (step change)

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from 80%. These evolutions will be closely observed for any evidence of malfunction and adjustments/modifications made, if necessary to optimize safe operation of these control systems.

We are confident the tests listed in (2) and (3) above exceed the requirements of Reg. Guide 1.68, App. A Sections D.l.c and D.l.d regarding plant response to load swings and checkout of automatic control systems. We feel the only question is sequence of testing in that we plan to perform the tests listed in (3) above after operation at 100% power. This is done to limit plant transients until the fuel has had significant operation at full power and the plant systems have been adjusted and tuned so as to assure a high probability of proper safe operation.

Since Regulatory Guide 1.68, addresses power ascension tests performed after criticality "that confirm the design basis and demonstrate, where practical, that the plant is capable of withstanding the anticipated transients and postulated accidents.", we feel this sequence is acceptable, and it will be of considerable aid in avoiding fuel damage which has become an industry concern since Reg. Guide 1.68 was written. Although it was not stated in our previous letter, preoperational test 1400084, discussed in (3) above, was revised to include load swings. This was done to answer NRC I&E and Licensing concerns and to ensure that load swing response with control systems in automatic operation will be thoroughly tested in accordance with Reg. Guide 1.68, App. A, Sections D.l.c and D.l.d.

The following paragraphs expand upon (2) above and provide additional information to explain how we test plant response to load swings and checkout the various automatic control systems during the <u>initial ascent</u> to 100% power. These paragraphs also discuss the procedural precautions and instructions to the operators and test engineers regarding continuing observation and reporting of control systems operation. This is testing done <u>in addition to</u> that described in (3) above. This testing will give increased assurance that the involved systems will perform properly during transients before the severe transients in the "post 100%" testing are imposed on the plant. This will provide additional assurance that we do not discover a control system malfunction <u>during a transient</u> when no real (immediate) adjustment or corrective action is possible.

Our Nuclear Steam Supply System vendor strongly recommends that we follow power ascension test guidelines similar to those previously used at other CE supplied plants. These guidelines minimize plant transients which could jeopardize plant equipment and could subject the fuel to local power peaking before it has been preconditioned. These recommendations include slow ascent to all plateaus using boron dilution with all CEA's fully withdrawn and the Reactor Regulating System (CEA control) in the manual mode. The turbine control system will be in manual (load limit) control to prevent the (turbine) valves from opening due to any increase in electrical demand from the FP&L grid system. The test procedures for specific transients require the operator to trip the plant if a transient should occur which has not previously been tested.

Following these previously used guidelines from similar plants and as described in Chapter 14 of our FSAR, the power ascension test program is divided into 5 major parts. The first four parts include ascension to and operation at plateaus of 20%, 50%, 80% and 100% of rated thermal power. Operation and testing at each plateau are terminated by a reactor trip. Also, after the trip from the 80% plateau, two additional trip tests (Total Loss of Flow and Loss of Off-Site Power) are performed. And, during initial 100% operation there will be a turbine trip and a generator trip from 100% power. In addition to these ascensions and trips, the 50%, 80% and 100% plateaus will include a variable Tavg test which includes both down and up 5% power changes and 10°F changes in Tavg. The fifth part is "post 100%" testing which is partially described in (2) above. Keeping this sequence in mind, we now can discuss the specific testing of the various automatic control systems during the first four parts of the test program (initial ascent to 100% power).

Automatic pressurizer pressure and level control have already been tested, including all alarm and action setpoints. In addition, this system will be in automatic operation throughout the entire power ascension program. It will be observed on a continuing basis for any evidence of malfunction so that adjustments, tuning or modifications can be made, if necessary, to optimize its safe operation.

The steam bypass control system is specifically tested before reaching 20% power and will be in automatic operation for each trip. For these and any other transients which require its operation, we will ensure that it does function properly by monitoring its performance and making adjustments/modifications, if needed, to optimize its safe performance.

Steam generator feedwater control initially will be placed in automatic operation at about 20% and its performance evaluated. Based on previous results from similar CE plants, we feel we may have to make adjustments/modifications.

We will then continue testing automatic operation as power is increased. We expect to have steam generator feedwater control in automatic operation before 50% power and will maintain it in automatic for all further testing. We will then observe its operation, on a continuing basis, for any evidence or malfunction and make adjustments/modifications, as necessary, to optimize its safe operation.

The turbine will be in manual (load limit) control for most of the four part program to ensure that it will not impose unplanned transients upon the NSSS. The turbine control system will be placed in automatic operation for a period of time at each plateau and continuously observed for evidence of malfunction. Adjustments/modifications if needed, will be made to optimize its safe performance in steady state operation. This will give us additional assurance that the system will perform properly during the transients to be performed during part 5. Automatic turbine control will not be used at any other time until the "post 100%" testing which will demonstrate the transient capability of the system as discussed in (3) above.

The Reactor Regulating System will not be used for automatic control of CEA's at any time until RRS performance testing during the "post 100%" part of our test program. Our operators have written instructions, backed up by the test coordinators' briefings on testing, to trip the reactor if we inadvertently get into any previously untested situation and to trip the reactor in the event of any unplanned transient. These instructions apply throughout the entire testing program, parts 1 through 5, and it should be noted that unplanned automatic operation of the RRS is one example given of a situation requiring immediate operator corrective action and/or reactor trip.

The RRS testing in the "post 100%" test program will include the necessary transients to demonstrate not only RRS automatic capabilities but also coordinated response and control of all the systems discussed above as explained in our previous letter (Ref. a) and (3) above. Again we emphasize that the RRS will not be used in automatic until this testing has been performed.

We would like to reemphasize that the evolutions performed during initial ascent to 100% (parts 1 thru 4 of our 5 part test program) ensure that the involved systems are thoroughly tested before part 5 is performed. This sequence is used so that we will have assurance that the automatic systems are performing properly during initial ascent to 100% and will perform properly during the transients involved in part 5, "post 100%" testing.

We feel this sequence of testing provides the minimum exposure to possible unsafe conditions in that it allows a fair opportunity to evaluate and then optimize the control systems' performance before we attempt to control the major transients involved in the part 5, "post 100%" testing described in our previous letter (Ref. 1) and (3) above.

We feel very strongly that this is the most prudent mode of testing to meet the requirements of Reg. Guide 1.68, Appendix A, Sections D.1.c and D.1.d in a safe and efficient manner while ensuring minimum wear on plant systems and minimum effect on the reactor core (fuel).

Again we emphasize that throughout the entire power ascension test program we will monitor plant and control systems' operation on a continuing basis and use these observations to make adjustments/ modifications to ensure optimum safe operation.

We feel this program meets and exceeds the requirements of Reg. Guide 1.68, Appendix A, Sections D.1.c and D.1.d with minimum effect (immediate and future potential) on the plant systems and fuel. We feel that the preconditioning recommended by CE will prove very important in assuring future safe, reliable plant operation without potentially very serious fuel leakage which we feel far outweighs any benefits of changing this test sequence.

Very truly yours,

Robert E. Uhrig

Robert E. Uhrig
Vice President

KNH/GEL/cpc

cc: Mr. Norman C. Moseley
Jack R. Newman, Esquire