

2-3-72 5C-302  
FEDERAL POWER COMMISSION  
BUREAU OF POWER

Report No. 3  
File No.

Report on the Crystal River Unit No. 3  
and the Possible Effects of Delays Due to  
Suspension of Construction During NEPA Review

On November 3, 1971, the Assistant Director for Boiling Water Reactors, Division of Reactor Licensing, U. S. Atomic Energy Commission forwarded to the Federal Power Commission for comment a copy of the report provided by the Florida Power Corporation containing its assessment of the need for power to be provided by Crystal River Unit No. 3 in connection with consideration as to whether the construction permit for this unit should be suspended, in whole or in part, pending completion of the required ongoing NEPA review.

We understand that the environmental aspects are currently undergoing supplemental analysis in which the AEC wishes to consider such factors as: the effect of delays in facility operation upon the public interest, particularly "the power needs to be served by the facility; the availability of alternative sources, if any, to meet those demands on a timely basis; and delay costs to the licensee and to the consumer." Thus, our comments are directed primarily to these points in a review of the need for the Crystal River Unit as concerns the adequacy and reliability of both the Applicant's electric system, and the Florida Group of the Southeastern Electric Reliability Council (SERC) of which the Applicant is a part. This is in accordance with the National Environmental Policy Act of 1969 and the Guidelines of the President's Council on Environmental Quality dated April 23, 1971.

In preparing this report, the Bureau of Power staff has considered the Applicant's Crystal River Unit No. 3 Nuclear Generating Plant Environmental Report; the testimony of Mr. J. T. Rodgers, Assistant Vice President and Nuclear Project Manager of Florida Power Corporation as contained in the Supplement to the Environmental Report; periodic reports filed with FPC by the utility; related reports made in response to the Commission's Statement of Policy on Adequacy and Reliability of Electric Service (Order No. 383-2); and the FPC staff's independent analyses of these documents together with related information from other FPC reports.

Need for the Facility

The following tabulations show the projected loads to be served by the Applicant and the Florida Utility Group, and the relationship of the Crystal River Unit No. 3, presently scheduled for commercial operation in September 1973, to their expected available reserve capacities at the time of the 1973-74 winter and 1974 summer peaks. This is the anticipated

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initial service period of the new unit, but the life of the unit is expected to be some 35 years, and it is expected to constitute a proportionate part of the Applicant's total generating capacity throughout that period. Therefore, it will be depended upon to supply power to meet future demands over a period of many years beyond the initial service needs discussed in this report.

Crystal River No. 3, rated at 825 megawatts, represents approximately one-fifth of Florida Power Corporation's total expected available capacity in 1974. The unit accounts for all of the Applicant's projected 1973-74 winter reserves of 569 megawatts or 18.7 percent of peak load and over 75 percent of the 1974 summer reserves of 1,049 megawatts or 33.9 percent of peak load.

Forecasted 1973-74 Winter Peak Situation

	<u>Florida Power Corporation</u>	<u>Florida Group</u>
<u>Conditions Without Crystal River No. 3</u>		
Net Dependable Capacity - Megawatts	2,784	16,105 <sup>1/</sup>
Peak Load - Megawatts	3,040	13,830
Reserve Margin - Megawatts	-256	2,275
Reserve Margin Percent of Peak Load	-8.4	16.4
Capacity Deficiency - Megawatts	864	491
<u>Conditions With Crystal River No. 3 (825 Megawatts)</u>		
Net Dependable Capacity - Megawatts	3,609	16,730
Peak Load - Megawatts	3,040	13,830
Reserve Margin - Megawatts	569	2,900
Reserve Margin Percent of Peak Load	18.7	21.0
Capacity Deficiency - Megawatts	39	--
Company's Estimate of Needed Reserve - Megawatts <sup>2/</sup> (20 Percent of Peak Load)	608	2,766
Plant Capacity as Percent of Needed Reserve	136	30

<sup>1/</sup> Includes 200 megawatts peaking capacity to be added in 1973.

<sup>2/</sup> The Company states "Although percent reserve is not an adequate single criterion for assessment, it is felt that a margin of from 20 percent to 25 percent is necessary to maintain a degree of reliability to the State, acceptable by the Federal Power Commission."

Forecasted 1974 Summer Peak Situation

	<u>Florida Power Corporation</u>	<u>Florida Group</u>
<u>Conditions Without Crystal River No. 3</u>		
Net Dependable Capacity - Megawatts	3,314	18,355 <sup>1/</sup>
Peak Load - Megawatts	3,090	14,630
Reserve Margin - Megawatts	224	3,725
Reserve Margin - Percent of Peak Load	7.2	25.4
Capacity Deficiency - Megawatts	394	--
 <u>Conditions With Crystal River No. 3 (825 Megawatts)</u>		
Net Dependable Capacity - Megawatts	4,139	18,980
Peak Load - Megawatts	3,090	14,630
Reserve Margin - Megawatts	1,049	4,350
Reserve Margin - Percent of Peak Load	33.9	29.7
Company's Estimate of Needed Reserve - Megawatts <sup>2/</sup> (20 Percent of Peak Load)	618	2,926
Plant Capacity as Percent of Needed Reserve	138	28

<sup>1/</sup> Includes 200 megawatts peaking capacity to be added in 1973.

<sup>2/</sup> The Company states "Although percent reserve is not an adequate single criterion for assessment, it is felt that a margin of from 20 percent to 25 percent is necessary to maintain a degree of reliability to the State, acceptable by the Federal Power Commission."

Without Crystal River Unit No. 3, Florida Power Corporation's generating capacity is projected to be 256 megawatts less than peak load in the winter of 1973-74 and only 224 megawatts more than peak load in the summer of 1974. Furthermore, the 224 megawatts or 7.2 percent reserve for the summer of 1974 is contingent on the availability of Anclote Unit No. 1, a 515-megawatt fossil-fired unit, scheduled for service in April 1974, and assumes that all other existing generating facilities are operating.

The Florida Group is composed of seven major utilities; Florida Power and Light Company, Florida Power Corporation, Tampa Electric Company, Orlando Utilities Commission, Jacksonville Electric Authority, City of Lakeland and City of Tallahassee, and a number of smaller municipal generating systems. The utilities in the State operate on

the concept of assisting each other when possible; but in general, each utility is responsible for its own system and load. The Applicant considers a minimum reserve margin of 20 percent necessary to maintain the desired degree of system reliability.

Including Crystal River No. 3, the Florida Group projects a total capacity of 16,730 megawatts with a reserve of 2,900 megawatts or 21 percent of peak load for the winter of 1973-74 and a total capacity of 18,980 megawatts with a reserve of 4,350 megawatts or 29.7 percent of peak load for the summer of 1974. If Crystal River No. 3 should be delayed, the reserves for the Florida Group would be 2,275 megawatts or 16.4 percent of peak load and 3,725 megawatts or 25.4 percent of peak load for the 1973-74 winter and 1974 summer peaks respectively.

The projected reserve margins for the Florida Group are dependent on a number of large new generating units scheduled for service after 1972.<sup>2/</sup> Recent experience with new large generating units indicate frequent forced outages of these units during the initial months of their operation. A delay in any one of these units will have a serious effect on the generating capacity reserves.

#### Transmission Facilities

The Crystal River No. 3 nuclear unit is being constructed on the same general site as the currently operating fossil-fired units, Crystal River No. 1 (387 megawatts) and Crystal River No. 2 (510 megawatts). The two fossil-fired units now supply their energy into the bulk power system through 230 kilovolt transmission lines. The Applicant's original plans, when the site and transmission line rights-of-way for Units No. 1 and No. 2 were purchases several years ago, included space provisions on the same corridors for the transmission line additions accompanying the added capacity of the No. 3 unit. With the No. 3 unit, the Applicant is initiating its EHV transmission line program to maximize the use of the previously obtained rights-of-way. This construction is approximately 80 percent complete and consists of the Crystal River-Central Florida and the Crystal River-Lake Tarpon 500-kilovolt lines totaling 125 miles with a 500 kilovolt substation at each of the three terminals which will integrate the EHV system into the existing bulk power network.

#### Alternates to the Proposed Facilities

Within the time available, there are no known practical alternate additions of generating capacity which could be substituted for Crystal

<sup>2/</sup> Scheduled for service after 1972: Sanford No. 5--379 megawatts, Big Bend No. 2--437 megawatts, Indian River No. 3--325 megawatts, Northside No. 3--550 megawatts, Anclote No. 1--515 megawatts, Hutchinson Island No. 1--810 megawatts, Port Manatee No. 1-775 megawatts.

River Unit No. 3. The only realistic alternate to the nuclear-fueled generating unit would be a similar sized fossil-fueled unit, but there is insufficient time available for such a substitution at this point. There are no hydroelectric sites in the Florida area capable of development to provide capacities equivalent to Crystal River No. 3.

Most of the utility systems from which the Florida Power Corporation might otherwise receive energy are also hard-pressed to stay abreast of their own system demands. Therefore, it is not realistic to depend on imported power as a substitute for the Crystal River Unit.

While gas-turbine peaking capacity could help alleviate the situation, if the nuclear unit should be delayed, it is not considered to be a practical solution to the need for base-load capacity on the Applicant's system. Gas turbine installations are usually designed to provide peaking capacity which is not desirable for base-load operation from the stand-points of either cost or reliability.

Within the present state of the art of high-voltage electric power transmission, there does not appear to be any other transmission arrangement which would be superior to that already planned.

#### Conclusions

The Bureau of Power staff considers the 825 megawatts of capacity of the Crystal River No. 3 unit to be needed to meet projected peak loads and maintain a level of system reserves required to provide reliability of area bulk power supply. Even few months delay would result in the Applicant's having insufficient capacity for the 1973-74 winter. Due to limited transmission capacity and the expected generating capacity situations elsewhere, reliance on significant amounts of imported power is not practical. The overall capacity situation for the total Florida Group is more optimistic, but the projected capacities of several of the other systems are similarly contingent upon bringing large new units into commercial service during the same periods of time.

The factors examined indicate there is an acute need for the Crystal River Unit No. 3 in terms of an adequate and reliable supply of electric power. We conclude that, assuming the AEC can concurrently deal appropriately with the environmental issues involved, it would be imprudent not to timely provide the facilities discussed if the needs for an adequate and reliable electric power supply are to be served.

The Applicant states that its present construction program taxes its ability to attract adequate funds and any added costs would seriously jeopardize its financial integrity. In estimating the added costs associated with a stoppage of the construction program, if required by AEC, pending

completion of NEPA environmental review, the Applicant based the costs upon a 12 month construction stoppage which it stated would result in an ultimate 18 month delay in the commercial operation date. The capital costs of the accelerated purchase of combustion turbines with which to meet peak demands was not given, but the Applicant estimated an increased fuel cost for the 18 month period of \$51,000,000 over the less expensive nuclear generated electrical energy planned. Maintenance during stoppage and demobilization, remobilization, and escalation of labor costs associated with field forces is estimated to be \$2,627,000. Excluding nuclear fuel, the delay from September 1973 to March 1975 operation is estimated to increase project cost from \$241,610,000 (\$293/kW) to \$264,362,000 (\$320/kW). In the same period, the first core fuel investment would increase from \$25,646,000 to \$27,313,000. This \$78,046,000 total of the above added costs, plus costs associated with an idle capital investment of \$30,000,000 in 500 kilovolt transmission facilities, would eventually be borne by the consumer through increased electric rates. Except to note that the Applicant's estimate of capital costs (\$293 to \$320 per kilowatt of capacity) is of the relative order of magnitude reported by some other utilities, sufficient detail was not available to permit an extensive cost analysis.

  
T. A. Phillips

January 18, 1972