

Testimony of  
Michel P. Armand

My name is Michel P. Armand. A resume of my educational and professional qualifications has previously been supplied to the Appeal Board.

I have reviewed the NRC Staff testimony submitted under letter to this Board dated September 21, 1979 and, in accordance with ALAB-537 of April 5, 1979, submit the following written testimony in response thereto.

The following statement is contained on page 6 of the NRC Staff Testimony of Robert G. Fitzpatrick ("Fitzpatrick Testimony"):

Applicant provides an analysis which demonstrates the ability of the Midway Substation to withstand two independent bus failures and still maintain the ties between the grid and St. Lucie. This academic exercise shows some of the inherent flexibility incorporated into a breaker-and-a-half switchyard configuration. This point has very little bearing on the capability of the grid with respect to St. Lucie. Without being quantitative, a bus failure is probably the least likely failure in a power system. To postulate two such independent failures on equipment located so closely together without affecting any of the intervening electrical equipment is of low enough probability to be considered incredible for licensing purposes.

(Emphasis added; footnote omitted.) The referenced analysis, however, was not intended to demonstrate the "capability of the grid with respect to St. Lucie." Rather, it was meant to directly address that part of the Board's concern -- as expressed in question A1 -- regarding the termination of all three transmission lines from St. Lucie at a single substation. The analysis demonstrates the inherent strength of that connection to the grid.

As discussed in the analysis, St. Lucie is tied to the grid at the Midway substation by means of three separate 240 kV lines. The substation is so arranged that, even assuming -- as an extreme -- the simultaneous loss of both of the physically separated 240 kV substation busses, the breaker-and-a-half scheme would serve to provide continued connections between the grid and each of the three circuits running to St. Lucie. Joint Testimony of Michel P. Armand, Ernest L. Bivans and Wilfred E. Coe Relating to Questions A1 and D of ALAB-537, pp. 6-7 ("Armand, Bivans and Coe Testimony"). Thus, while the breaker-and-a-half scheme does not serve to enhance the capability of the grid as such, it does provide a strong connecting link between the grid and the three circuits running to St. Lucie. It is the strength of this link, among other things, in which the Board had expressed interest and which FPL was attempting to address in the referenced testimony.

The Fitzpatrick Testimony also refers to FPL's discussion of an alternative means of connecting one of the three St. Lucie lines to the grid at the Ranch substation, instead of Midway, in the following terms (p. 7):

Applicant also provides an analysis of what changes in reliability could be gained by bringing one of the St. Lucie transmission lines directly to the Ranch Substation. The analysis appears to be carefully constructed to demonstrate no reliability can be gained by a physical change in the grid system. The staff is not convinced that the modified design, as presented, is the design that the applicant would choose if the Appeal Board should require a grid connection for St. Lucie at other than the Midway

Substation. A seemingly much more practical approach would have been to investigate what lower voltage distribution systems in the area of St. Lucie could be tapped for a connection to the nuclear units. This concept would leave the three St. Lucie to Midway lines intact with no reduction in present reliability and would provide a relatively low cost alternative way to supply St. Lucie a grid connection at other than the Midway Substation with a definite increase in overall reliability.

(Footnote omitted.)

Again, however, the thrust of FPL's testimony appears to have been misapprehended. The analysis of the impact of terminating one of the three St. Lucie lines at the Ranch substation was also provided in response to Appeal Board question A1. That question is phrased in terms of the routing of the existing three 240 kV circuits. The purpose of these circuits is not only to supply offsite power in accordance with GDC 17, but also to accommodate the power output of the two St. Lucie units as well. Consequently, these lines must connect to a strong portion of the FPL grid and, therefore, must be tied to major transmission substations, such as Midway or Ranch. Accordingly, FPL's analysis considered such an alternative and, in the process, demonstrated why the existing design is preferable to tying one of the St. Lucie circuits to the grid at another potential location. Armand, Bivans and Coe Testimony, p. 8. Other system configurations involving the three existing circuits from St. Lucie were also analyzed.<sup>\*/</sup> The results support the position that the present arrangement is preferable to any other considered.

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<sup>\*/</sup> Summaries of these analyses were made available to Mr. Edward J. Fowlkes of the FERC and to the NRC Staff, and provided to this Board and all parties under letter dated September 19, 1979.

An alternative involving the construction of an additional line to St. Lucie was not investigated in any detail since FPL does not feel such a line to be necessary. Nor was such a line suggested by Board question A1, which merely questioned the termination of the three existing lines at Midway substation.

Assuming that the principal concern were simply to bring an additional transmission line to St. Lucie, the Staff has suggested a means by which such a line could be routed over existing structures. Fitzpatrick Testimony, pp. 7-8. However, the method is not feasible.

An additional line at the river crossing would require substantial modifications to or replacement of the structures, including replacement of the foundations in the river, in order to maintain required vertical clearance over the Intra-coastal Waterway. Further, the existing crossing was designed with spacing between each of the parallel circuits such that the toppling of one support structure would not endanger an adjacent line. The increased height of the modified or new structures, however, would result in a configuration whereby the falling of one of these structures could result in the disabling of both the circuits it would be carrying, and an adjacent circuit as well.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY & LICENSING APPEAL BOARD

In the Matter of: )  
 )  
FLORIDA POWER & LIGHT COMPANY ) Docket No. 50-389  
 )  
(St. Lucie Nuclear Power Plant, )  
Unit 2) )

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that true and correct copies of the foregoing letter dated October 12, 1979, addressed to the Members of the Atomic Safety and Licensing Appeal Board, together with the enclosed "Testimony of Michel P. Armand," have been served this 12th day of October, 1979, on the persons shown on the attached service list by deposit in the United States mail, properly stamped and addressed.

  
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October 12, 1979

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