Thornton Williams and Associates

Attorneys at Law
215 South Monroe Street, Suite 600-A
Tallahassee, FL 32301
Telephone: (850) 224-3999
Fax: (850) 224-0099

September 27, 1999

ORIGINAL

Ms. Blanca Bayo
Director, Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket 981890-EU
Generic Investigation into the Aggregate Electric Utility
Reserve Margins Planned for Peninsular Florida

Dear Ms. Bayo:

Enclosed please find the original and fifteen copies of the prefiled rebuttal testimony of Mario Villar and an accompanying Certificate of Service.

Sincerely,

Paul Sexton

AFA 2
APP
CAF
CMU
CTR
EAG
LEG 1
MAS 5 + orig
OPC
PAI 2
SEC 1
WAW
OTH

PS:qs

Enclosure

cc: Ken Wiley
Parties of Record

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Generic Investigation Into The Aggregate Electric Utility Reserve Margins Planned for Peninsular Florida.	))))	Docket No. 981890-EU Submitted for filing: September 27, 1999

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the Prefiled Rebuttal Testimony of Mario Villar has been furnished by U.S. mail to the persons listed on the attached service list on this 27th day of September, 1999.

Paul Sexton
Thornton Williams & Associates
P O Box 10109
215 S. Monroe St., Suite 600A
Tallahassee, FL 32302
(850) 224-3999
(850) 224-0099 - Fax

Counsel for :

The Florida Reliability Coordinating Council, Inc.

SERVICE LIST

Robert V. Elias, Esq.
Leslie J. Paugh
Division of Legal Services
FPSC
2540 Shumard Oak Blvd., Room 370
Tallahassee, Florida 32399

James D. Beasley, Esq.
Ausley & McMullen
227 South Calhoun Street
Post Office Box 391
Tallahassee, Florida 32301

Matthew M. Childs, Esq.
Steel Hector & Davis
215 South Monroe, Suite 601
Tallahassee, Florida 32301

Robert Sheffel Wright, Esq.
John T. LaVia, III, Esq.
Landers and Parsons, P.A.
Post Office Box 271
Tallahassee, Florida 32302

John Roger Howe, Esq.
Office of Public Counsel
111 West Madison Street, Suite 812
Tallahassee, Florida 32399

Roy C. Young, Esq.
Young, Van Assenderp et al.
225 S. Adams Street, #200
Tallahassee, Florida 32301

Fla. Public Utilities Co.
Mr. Jack English
401 S. Dixie Highway
West Palm Beach, Florida 33402

City of Homestead
Mr. James Swartz
675 N. Flagler Street
Homestead, Florida 33030
City of Lakeland

Mr. Gary Lawrence
501 E. Lemon Street
Lakeland, Florida 33801

City of St. Cloud
Mr. J. Paul Wetzel
1300 Ninth Street
St. Cloud, Florida 34769

City of Vero Beach
Mr. Rex Taylor
Post Office Box 1389
Vero Beach, Florida 32961

Fort Pierce Utilities
Mr. Thomas W. Richards
Post Office Box 3191
Ft. Pierce, Florida 34948

Gainesville Regional Utilities
Mr. Raymond O. Manasco, Jr.
Post Office Box 147117
Station A-138
Gainesville, Florida 32614

Kissimmee Utility Authority
Mr. Ben Sharma
Post Office Box 423219
Kissimmee, Florida 34742

Mr. Robert Williams
7201 Lake Ellinor Drive
Orlando, Florida 32809

Gary L. Sasso
Carlton, Fields, Emmanuel, Smith
Ward & Cutler
Post Office Box 2861
St. Petersburg, Florida 33731

Richard Zambo
598 SW Hidden River Avenue
Palm City, Florida 34990

Joe Welborn
Lane Mahaffey
16313 North Dale Mabry Highway
Tampa, Florida 33618

Debra Swim,Esq.
Ms. Gail Kamaras
LEAF
1114 Thomasville Road, Suite E
Tallahassee, Florida 32303

James A. McGee, Esq.
Florida Power Corporation
Post Office Box 14042
St. Petersburg, Florida 33733

Jeffery Stone, Esq.
Beggs & Lane
Post Office Box 12950
Pensacola, Florida 32576

John W. McWhirter
McWhirter Reeves
Post Office Box 3350
Tampa, Florida 33601-3350

Frederick M. Bryant, Esq.
General Counsel
Fla. Municipal Power Agency
2010 Delta Boulevard
Tallahassee, Florida 32315

Ms. Michelle Hershel
Fla. Electric Cooperative Assoc.
Post Office Box 590
Tallahassee, Florida 32302

Joseph A. McGlothlin, Esq.
Vicki Gordon Kaufman, Esq.
McWhirter Reeves
117 South Gadsden Street
Tallahassee, Florida 32301

Mr. Timothy Woodbury
Vice-President, Corp. Planning
Seminole Electric Cooperative
Post Office Box 272000
Tampa, Florida 33688-2000

City of Lake Worth Utilities
Mr. Harvey Wildscheutz
1900 Second Avenue, North
Lake Worth, Florida 33461

City of Ocala
Mr. Dean Shaw
Post Office Box 1270
Ocala, Florida 34478

City of Tallahassee
Mr. Richard G. Feldman
300 South Adams Street
Tallahassee, Florida 32301

Florida Keys Electric
Cooperative Association
Mr. Charles A. Russell
Post Office Box 377
Tanernier, Florida 33070

Jacksonville Electric Authority
Mr. Tracy E. Danese
21 West Church St., T-16
Jacksonville, Florida 32202

Orlando Utilities Commission
Mr. T. B. Tart
Post Office Box 3193
Orlando, Florida 32802

Utility Board of the City of Key West
Mr. Larry J. Thompson
Post Office Box 6100
Key West, Florida 33041

John C Moyle
Moyle, Flanigan, Katz, Kolins,
Raymond & Sheehan, P.A.
The Perkins House
118 North Gadsden Street
Tallahassee, Florida 32301

Roger L. Vaden
Utilities Commission
City of New Smyrna Beach
Post Office Box 100
New Smyrna Beach, Florida 32170

Willard Smith
Fran Winchester
Reedy Creek Improvement District
Post Office Box 10175
Lake Buena Vista, Florida 32830

ORIGINAL

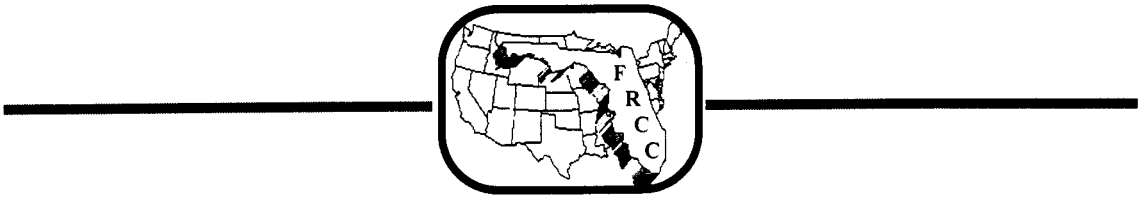
BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Generic Investigation Into the Aggregate Electric Utility Reserve Margins Planned For Peninsular Florida.	))))	DOCKET NO. 981890 - EU SUBMITTED FOR FILING: 9/27/99

REBUTTAL TESTIMONY OF:

MARIO VILLAR

SUBMITTED ON BEHALF OF
THE FLORIDA RELIABILITY COORDINATING COUNCIL



FLORIDA RELIABILITY COORDINATING COUNCIL

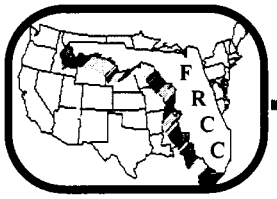
BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Generic Investigation Into the Aggregate Electric Utility Reserve Margins Planned For Peninsular Florida.	))))	DOCKET NO. 981890 - EU SUBMITTED FOR FILING: 9/27/99

REBUTTAL TESTIMONY OF:

MARIO VILLAR

SUBMITTED ON BEHALF OF
THE FLORIDA RELIABILITY COORDINATING COUNCIL



FLORIDA RELIABILITY COORDINATING COUNCIL

DOCKET 981890-EU
GENERIC INVESTIGATION INTO THE AGGREGATE ELECTRIC UTILITY RESERVE MARGINS PLANNED FOR PENINSULAR FLORIDA

REBUTTAL TESTIMONY OF MARIO VILLAR

Q. Please state your name and business address.

A. My name is Mario Villar and my business address is 9250 West Flagler Street, Miami, Florida 33174.

Q. Are you the same Mario Villar who submitted testimony in this proceeding on August 16, 1999?

A. Yes, I am.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to: i) address the alleged shortcomings of the FRCC's Reserve Margin Analyses described by Staff witness Ballinger; ii) address Mr. Ballinger's claim that adherence to a 15 % reserve standard could challenge the Peninsula's capacity resources; iii) clear up the confusion created by Mr. Ballinger's testimony which attempts to evaluate Planning Reserves using actual operating reserves during off-peak periods; iv) address the potential repeat and consequences of a Christmas 1989 scenario characterized in Messrs. Ballinger and Trapp's testimony; v) address Mr. Trapp's judgmental recommendation of setting a 20% reserve margin; and vi) address the proposed inclusion of non-committed capacity in reserve margin calculations and other matters raised in Mr. Trapp's testimony.

Q. Do you have a general response to Mr. Ballinger's testimony?

A. Yes. To begin with, Mr. Ballinger questions the "adoption" of a reliability standard that has not been through the rigors of time testing. Ballinger p. 5, lines 6-7. It is clear that his criticisms of the FRCC Standard are not valid, and he never defines what "the rigors of time testing" actually means.

Mr. Ballinger acknowledges that utilities have used a 15% reserve margin criterion for some time, but that probabilistic criterion such as LOLP had historically been the driving factor for most capacity additions. He also recognizes that generating unit availabilities have improved over the last few years to unprecedented levels and that this has had a dramatic impact on reliability (positive), but he cautions against recognizing such higher availability "because of its recent emergence, has not withstood the test of time." He does not explain how improved availability should be tested, or over what period of time.

Mr. Ballinger's testimony in this, and other areas addressed later, seems to imply that "we haven't learned anything since 1989 and we should continue to maintain very high reserve margin levels until we do". He states that off-peak period maintenance should be included in reserve margin calculations. This is an operational issue and not part of long range utility planning. Moreover, while rejecting FRCC's data, Mr. Ballinger's arguments provide criticisms based on "what ifs".....what if unit availability declines?; what if loads are as high as they were in 1989?; what if utilities' forecast errors are as large as they were in 1989?; what if DSM resources are not available?; what if utilities take units out

for maintenance?; what if utilities only have exactly a 15% reserve margin instead of the ones actually projected? He has not taken into account the procedures implemented as a result of the lessons learned from the 1989 cold weather event. Furthermore, he has not provided any scientific or practical explanation of what is wrong with the planning methodologies or how those concerns can be addressed.

Mr. Ballinger's "analysis" is primarily an extension of the Staff's "Critical Concerns" expressed in Section 3.6 of the 1998 Ten Year Site Plan Review, which went so far as to speculate that "(I)f utilities reduce maintenance on existing units to minimize costs, and if they hesitate to build new needed generating units, capacity shortages may become a reality in the near future." This is merely a statement of the obvious. If you don't maintain units and you don't build units, reliability is likely to suffer. However, to criticize Ten Year Site Plans on that basis is neither constructive nor meaningful. One can always assume that whatever you plan will not happen. On that basis, no plan can ever be suitable. It is inappropriate for Staff to support its arguments based on these kinds of statements.

The 15% minimum reserve margin standard is not a "new" standard. It has been used for a number of years by many Florida utilities in their resource planning, and the Commission has reviewed the utilities' use of this standard in numerous dockets. Many utilities plan to a dual criterion of reserve margin and some form of probabilistic criterion (e.g., LOLP or EUE). Therefore, LOLP or EUE are also not new. This Commission has been reviewing Ten Year Site Plans filed by

Florida's utilities adhering to their individual standards over twenty five years. The only "newness" here is that the FRCC has now formally adopted a reserve margin standard for the region. In prior years, the FRCC, and previously the FCG, had relied on an LOLP reliability criterion as the primary means of evaluating the adequacy of generating resources. A reserve margin standard has recently replaced the LOLP criterion, since LOLP is no longer the driving force for additional resource needs. What has been characterized as "new" is not new at all, but simply an application of tried and true standards in light of changing operating conditions.

Reliability criteria, whichever are used by the individual utility or utilities, cannot be viewed in isolation. One criterion may be the driving factor at any point in time. The FRCC has conducted LOLP analysis for the last two years, which confirmed the fact that reserve margin is now the driving factor. The FRCC has also tested the projected LOLP under extreme conditions and found it generally acceptable. One of the reasons reserve margins were higher in the past was that unit reliability was lower, and therefore the LOLP criterion dictated the addition of additional generation resources to maintain the same level of reliability. In other words, the reason reserve margins might have been, for example 5% higher in the past, is that it was necessary to compensate for the lower unit reliability. Having spent significant dollars in improving unit availability, utilities do not need to keep as high a level of reserves to maintain that same reliability. Mr. Ballinger's approach would have more generating units built to provide additional reserves. Later in my testimony, I will discuss some of the actions taken by this Commission and utilities since 1989 that have reduced the

need to construct additional reserves.

Finally, in criticizing the FRCC's reserve margin standard, Mr. Ballinger and Mr. Trapp appear not to understand the critical relationship between system size, number and size of units, interconnections, load diversity, reserve arrangements and the needed level of reserves. For example, under their proposed 20% reserve margin, a utility with a load of 100 MW and 125 MWs of generation has 25% reserves and would therefore be deemed reliable. However, if all 125 MWs are in one unit, the moment that utility loses that unit it has zero generation in spite of its 25% numerical "reserves." If the same utility instead had five 25 MW units, it would have the same 25% reserves, but a significantly higher level of reliability. If this utility with five smaller units then added interconnections with its neighbors and reserve sharing arrangements, it would be even more reliable and could maintain its previous level of reliability with smaller reserves.

The FRCC region represents a very large system (approximately 36,000 MWs of firm load) that has adequate reliability due to the following:

- significant interconnections to the north
- reserve sharing arrangements
- load diversity among its members
- a very large number of units (over 350 units comprising about 38,000 MWs of installed generation)
- roughly 4,000 MWs of imports and in-state purchases
- pre-arranged plans under certain circumstances to manage load and meet needs

- pre-arranged procedures in the unlikely event that some load must be interrupted
- significant operational capabilities and resourcefulness that can be called upon to minimize any such interruptions.

A region with this much capability and resources does not need as high a level of reserves as smaller or less reliable systems.

Mr. Ballinger's "analysis" would have the Commission ignore all the existing data and assume that everything that can go wrong will and, in addition, that utilities and the Commission will both sit idly by and do nothing while all this happens.

Reserve margins, and the information produced by the FRCC's analysis, are but a tool to be used by planners in combination with appropriate engineering/economic judgment and experience in their overall assessment of system reliability. They are not, and should not, be an automatic if X is greater than Y, everything is OK with the system (or vice versa). Many utilities use dual criteria, because they complement each other (e.g., if unit reliability degrades, an LOLP or EUE analysis will catch it).

Q. Could you please address Mr. Ballinger's other concerns with the FRCC's Reserve Margin Analysis?

A. Yes. First, I'll address Mr. Ballinger's general criticism and then I'll address his three specific "shortcomings".

Mr. Ballinger states his belief that the FRCC method is simple, but produces questionable results. He selectively takes portions of the analysis out of context. contrasts them against last year's analysis and then suggests that the analysis is invalid because of the different results. Ballinger pp. 5-6. In doing so, Mr. Ballinger misrepresents the data in my Document Nos. 5 and 6, ignores the reasons for the different results between the 1999 and 1998 studies.

For 1999, the FRCC added one additional year of data to its database and made two improvements to its analysis. First, it eliminated the winter 1993 actual and projected data for utility installed generation from the analysis. As stated in the FRCC's 1999 Reserve Margin Analyses, "(I)n the Winter of 1993, the winter peak load actually occurred very late (in March). This peak occurred after various utilities had assumed that the peak load for that winter had already been experienced. Consequently, these utilities allowed generating units to come off-line for maintenance that had been planned for several weeks later in order to be better prepared for the upcoming summer loads. These units were then not available when this unexpectedly late winter load was experienced.

Since the installed generation Certainty Factor is designed to test 'breakage' (or forced outages) of units that are expected to be in-service during all peak periods, it was felt that continuing to include the effects of this 'unforced' maintenance experienced in 1993 was incorrect. Therefore, the actual and projected values for Winter 1993 were discarded in the FRCC's 1999 analyses (except the analysis of one scenario which was included solely to provide a comparison to the 1998 work)."

Second, the FRCC applied a non-coincidence adjustment factor to the aggregate of the peninsular utilities' loads. The FRCC had an outside contractor conduct a load diversity analysis on hourly load data since 1990 to develop the non-coincidence adjustment factor. As explained in the 1999 Reserve Margin Analysis, the aggregate approach used in the 1998 work ignores the load diversity among the peninsula utilities, so it tends to overstate the forecasted load which the peninsula will experience. Therefore, the FRCC developed non-coincidence adjustment factors based on historical data for winter and summer peaks. This is an improvement to the 1998 work, and is so noted on page 10 of the 1999 Reserve Margin Analyses. This improvement in the methodology makes it more representative of true conditions. It is these two methodology improvements, along with an additional year of data, that account for the difference between the 1999 and 1998 results that Mr. Ballinger alleges cast a shadow on the validity of the FRCC's analysis.

With regards to Document Nos. 5 and 6, the FRCC has never suggested that it would be prudent to carry 6% or negative reserves. However, the historical data examined showed that it would be possible to meet the projected load under the specified conditions with such reserve levels. This should not surprise anybody, given the reason why utilities carry reserves, i.e., to provide for uncertainties that may or may not materialize.

Given the conditions contained in the base case, it could be possible to meet the load with the "needed" reserves. For example, in the case of negative winter reserves, it means that based on recent historical data, the average winter load is

projected to be so much lower than the current forecasted load, that significantly lower reserves (i.e., lower by approximately 15% than those currently planned by the FRCC) would be sufficient to meet this average load. Hence, the current winter reserve margin could drop to zero percent or less (i.e., be negative compared to what it is currently projected to be) and still be sufficient to meet this lower average load. Likewise, for the projection of a "needed" 6% summer reserves, this refers only to the first summer in the analysis and reflects the fact that, on average, the FRCC's very near-term summer load forecasts have been accurate enough to enable the peninsula to meet the load with less reserves (6%) than is the case with longer-term summer load forecasts. It is for these long-term summer forecasts that the "needed" reserves are higher (up to 13%), due to the inherent lower accuracy with more long-term forecasts.

Q. Could you please address Mr. Ballinger's alleged three shortcomings of the FRCC analysis?

A. Yes. I will address them in sequence.

Load Diversity Factor

Mr. Ballinger terms the application of a load diversity factor a shortcoming of the FRCC methodology. FRCC disagrees. Increasing the accuracy of measurement is not a shortcoming. As described above, a load diversity factor is an improvement over last year's methodology. Diversity is a legitimate, recognized planning factor accepted by the Commission and applied within individual utility systems. There is no reason why load diversity should be ignored when it also exists between systems.

In addition, Mr. Ballinger has misread the FRCC's 15% standard. The standard applies to firm load and does not specify how that load is calculated, whether on a coincident or a non-coincident basis. The 15% reserve margin was not adopted with the assumption that an additional "buffer" was being provided by using non-coincident peak demand. The FRCC generally reports load on a non-coincident aggregated basis for convenience purposes, not because its reserve margin standard requires such reporting. The FRCC has not lowered the test bar, it is merely conducting its analysis on a more technically accurate basis. Moreover, the projected reserve margins shown in the FRCC's 1999 Load and Resource Plan and in the 1999 Reserve Margin Analyses are still shown on a non-coincident basis so as to not confuse the reader when comparing what was previously reported. However, the FRCC believes that for analysis purposes, the proper way to look at load is from a diversity perspective.

Off-Peak Periods

Mr. Ballinger claims that the FRCC's methodology is lacking because it does not address the exposure to capacity shortages during off-peak periods. The FRCC methodology does not include off-peak periods because these periods are more properly the focus of short term or operational planning. The methodology analyzes long range planning reserve margins, and such margins have never been calculated at any time other than for peak periods. However, all periods, including off-peak periods, are correctly addressed in LOLP analyses, such as those conducted by the FRCC. If Staff is concerned with off-peak periods, this concern should be addressed by the individual utilities in their operational and maintenance plans, and by the FRCC through the Operating Committee, not in

the Load and Resource Plan, in FRCC's Reserve Margin Analyses, or in Ten Year Site Plans. While Mr. Ballinger cautions against adopting untested standards, he proposes one himself.

Load Forecast Error Rates

Mr. Ballinger's criticism is that the load forecast error could be positive or negative, and that the FRCC uses a single average error rate. He states that if a criterion is to be truly tested, the test should be as rigorous as possible, and that as a planner, he is not too concerned if a utility over-forecasts its load. He is interested in how often and by what amount they were short of the mark. Mr. Ballinger is only looking at half of the planning equation.

Errors with Certainty Factors greater than 1 mean that we under-forecasted the load, which result in lower actual reserve margins. Errors with Certainty Factors less than 1 mean that we over-forecasted the load which result in higher actual reserve margins. Mr. Ballinger appears to only be concerned with under-forecast errors, presumably because more reserves could be required, all else being equal. FRCC's utility planners are concerned with both over and under forecast errors. We are concerned with under-forecast errors for the same reasons as Mr. Ballinger, however, over-forecast errors could result in unnecessary reserves being maintained, and being paid for, by our customers. Therefore, we look at errors in both directions to minimize unnecessary costs to our customers. The FRCC's base case analysis recognizes the net true error in the forecast. Historically, some utilities under-forecast and others over-forecast for any given year. To consider only the under-forecasted cases for a given year would mean

disregarding the effect of those utilities that have over-forecasted and failing to take reasonable steps to avoid unnecessary costs to our customers. Moreover, the complete set of FRCC analyses includes a scenario that does consider worst-case load forecast errors. This fact appears to be unaddressed by Mr. Ballinger. As described above, the FRCC has never proposed to carry "negative" reserves, even though that is what the analysis results could show at some points in time. If such results were sustained over time, the FRCC's members would likely look at their forecasting techniques and evaluate the need for modification to more closely reflect actual loads experienced.

Q. Could you comment on Mr. Ballinger's assertion that adoption of a 15% reserve margin criterion could challenge the capacity resources of Peninsular Florida utilities?

A. Yes. Mr. Ballinger presents two exhibits attempting to show his point. The exhibits, however, are speculative, confuse the concepts of planned and operating reserves and assume that not much has been learned since 1989.

Planning Reserves vs. Operating Reserves

Exhibit TEB-2 purports to compare projected operating reserve margins during declared capacity advisories over the last two years and then "estimates what the impact of having a 15% planned reserve margin would have had on the system." Mr. Ballinger confuses a number of concepts in his exhibit.

First, Mr. Ballinger speculates on what could have happened if utilities had only 15% reserves. This tends to misrepresent the FRCC's standard of a minimum of

15% reserves. Actual reserves by utilities are higher and that actual level cannot and should not be ignored. Also, when looking at actual reserves one should recognize that load diversity exists among Peninsular Florida utilities, and therefore actual % reserves may be higher than those calculated on the basis of aggregated non-coincident load. More importantly, Mr. Ballinger should not confuse the concept of operating reserves with planned reserves. The Commission has extensively scrutinized the planning and operations of Florida's utilities many times since 1989 (e.g., Ten Year Site Plans, Generic Investigation into Planning and Operating Reserve Practices of Peninsular Florida Generating Electric Utilities, Docket NO. 940345-EU), and has consistently recognized and upheld the distinctions between long range planning and short-term operations and maintenance issues. Planned reserve margins are calculated at the time of the winter and summer peaks, while operating reserves look at the short-term needs of the system. These are separate concepts governed by different considerations and should not be mixed or confused.

Operating reserves result from the use of those planned reserves throughout the year, combined with a number of operating factors that affect availability. These operating factors include projected short-term load forecasts, unit maintenance schedules, availability of power in the short-term market, interconnection and reserve sharing arrangements, and availability of certain operational capabilities that can minimize or eliminate the need for interruptions. The operating margins shown by Mr. Ballinger in TEB-2 for 1998 and 1999 were the product of consideration of those factors and projected short-term weather conditions. It is worthy of note that in spite of those advisories occurring during traditional

maintenance periods, the operating reserve margin was well above the level necessary to meet the loss of the largest unit in all but one day. At no time was firm load not served during this period as a result of a deficiency in capacity resources. For these reasons, Mr. Ballinger's Exhibit TEB-2 columns calculating reserves at 15% and 16% reserve margin levels are not meaningful.

Finally, Mr. Ballinger appears to work from the premise that there should always be excess capacity, no matter what the circumstances or how extreme the weather. The optimum utilization of resources from the customers' economic perspective would be to operate at or near zero reserves without coming up short of capacity. Utilities plan for a reasonable level of reserves, given certain weather conditions. Utility planning standards prudently anticipate that certain weather conditions will arise that lead to capacity advisories or alerts. Both the FRCC utilities and the Commission have spent considerable resources to develop operating plans to address such conditions. The purpose of these plans is to avoid or minimize instances of unserved load. The suggestion of Mr. Ballinger to simply ignore these operational measures and planning methodologies in favor of simply adding more capacity "just in case", should not be accepted on the basis of the analyses presented in his testimony.

The Ghost of Christmas Past (1989).

In last year's critique of the Ten Year Site Plans, the Staff stated that it did not expect utilities to plan for extreme weather. However, Staff continues to present calculations based on what occurred around Christmas 1989 as if nothing had been learned from that experience. Exhibit TEB-3 purports to show what could

happen if Christmas of 1989 temperatures (and other unrealistic assumptions) were to reoccur under both the FRCC's 1999 Load and Resource Plan projected reserves and under an imaginary 15% projected Reserve Margin.

The first column of Exhibit TEB-3 presents a summary of what occurred during Christmas 1989. Mr. Ballinger assumes that, had these conditions occurred during a work week as opposed to a weekend, outages would have been more widespread or longer in duration. Mr. Ballinger is incorrect in his assertions (his assumption might be true for summer loads, but not for winter loads). Part of the reason for the extremely high loads experienced during Christmas of 1989 was because it was a holiday weekend. With mostly everyone at home rather than at work, residential strip (resistance) heating load was a major contributor to the high peaks. Office buildings and other work places generally do not rely on this type of heating system, therefore the more efficient systems employed in commercial structures, produce winter loads that tend to be lower during working hours.

Summer peak load contribution is relatively even between the residential sector and the commercial/industrial sector. However, the winter is driven primarily by the residential sector which contributes approximately 75 to 80% of the winter peak. On a Christmas holiday when much of the commercial/industrial load is not present, the residential percentage would likely be even higher. Therefore, had the peak demand occurred during the workweek, it would likely have been lower than actually experienced, not higher as Mr. Ballinger assumes.

The second column of Exhibit TEB-3 purports to calculate the capacity shortfall that would occur for the winters of 1999/2000 and 2001/2002 with the projected FRCC reserve margins. Once again, while the calculations are mathematically accurate, the assumptions behind the calculations and the results they produce are entirely misleading. First, they assume that nothing has been learned since 1989. Second, they ignore the availability of various measures to utilities to meet or reduce expected loads. This is evident from Mr. Ballinger's own calculations for column one, where the difference between the actual 1989 firm peak (34,776 MWs) and the total capacity available (28,721 MWs) is 6,055 MWs, yet the actual firm load not served was estimated at 4,744 MWs. (It should be noted at this point that the FRCC can not agree with many of the 1989 numbers presented in Staff's analysis as it was unable to duplicate them from the 1989 Staff Report's documentation. Moreover, Staff's figures are not necessarily representative of true conditions, e.g., the 4,744 MWs appear to be merely an aggregation of utilities' estimates of unserved firm load, which may or may not have occurred on a coincident basis. Nevertheless, for purposes of this discussion only, we are working with Staff's own numbers.) Utilities were therefore apparently able to find approximately 1,311 MWs of what I will refer to herein as operational measures (these could be non-firm purchases, public appeals, load control scram, voltage reductions or other measures). This occurred at a time when there was not the degree of load control or coordination and planning that exists today. Mr. Ballinger's calculations ignore these facts and, therefore, produce an inaccurate and misleading result.

By Order No. 22708, dated March 20th 1990, this Commission adopted Staff's

report on the Christmas 1989 experience. That report contained several recommendations to improve Florida's exposure to similar conditions. The Order required the adoption of individual utility and FCG plans to deal with severe weather conditions (not merely cold weather). It defined different levels of alerts and required prearranged public information messages and plans to improve the public's knowledge of the potential for these events and their response in the form of greater load reductions when necessary. It required development of uniform guidelines for interrupting customer loads and better notification to QFs of high price periods to improve their availability at times of need. It suggested various areas for improvement by utilities ranging from reduced exposure of generating units to freezing conditions to increased public education, additional conservation and changes to building codes. It also urged expedition of the then current FERC review of a Florida Gas Transmission expansion proposal which had the effect of preventing some generating units from operating and created operating problems for others that did operate (due to lack of firm gas supplies).

The bottom line of this Order is that it resulted in a reduction of Florida's exposure to conditions similar to those of Christmas 1989. Florida's utilities responded to the requirements and the suggestions of Order No. 22708. Plans were developed, building codes were changed, utility plans were revised to better deal with winter conditions, additional conservation and demand side management measures were adopted under Commission supervision, and additional firm gas supplies are available to Florida's utilities. Utilities have also improved unit availability and are conscious of the potential effect of having units out for maintenance during high load periods. Therefore, circumstances are not

the same as they were in 1989, and assumptions, such as those adopted by Mr. Ballinger, which ignore the effects of improvements since then are unrealistic.

Another fallacy in Mr. Ballinger's scenarios is that he incorrectly assumes that there will be a significant amount of capacity out on maintenance during a high load period in the third week of December. Once again, he incorrectly mixes operating and planned reserves and then applies improper operating assumptions. First, Mr. Ballinger uses a maintenance plan developed in August of 1998, whereas by early December 1998 the amount of projected maintenance during that period, given then-projected loads, had actually been reduced by over 600 MWs as a result of utility coordination. Second, loads are generally not high during the first weeks of December, in fact, of all the high load dates of concern to Staff in Issue 16, none occur prior to December 19th. Third, utilities review their operating plans on a regular basis and can adjust them if they foresee an upcoming period of high loads. Finally, the FRCC projected maintenance after the third week of December 1998 and throughout January 1999 shows an average of 158 MWs out on maintenance. Therefore, Mr. Ballinger's analysis is inconsistent with how utility systems are operated in Florida.

I have prepared, as my Document Nos. 8 and 9, a more realistic planned reserve margin analyses of what might be expected under Christmas 1989 type conditions for the winters of 1999/2000 and 2001/2002, respectively, given improvements since 1989. Column 1 replicates Mr. Ballinger's Christmas 1989 calculations, but adds an entry for 1,311 MWs of operational measures not considered by Mr. Ballinger. Column 2 utilizes the FRCC's forecast for the

respective year, but presents the results ignoring any improvements in load forecasting methodologies or other improvements since then that result in lesser loads (i.e., it assumes a load forecast error of 16.9%). It utilizes the FRCC's developed Certainty Factor for utility owned generation of 6.4% and subtracts 158 MWs of unit maintenance for a total of 6.8% unavailable utility capacity. It also makes use of the FRCC's Certainty Factors for firm imports and QF capacity. Column 3 differs from column 2 in that it utilizes the worst-case winter load forecast errors identified in the FRCC's 1999 Reserve Margin Analyses for load forecasts projecting 2 years out and 4 years out (i.e., starting in 1998, a 2 year out projection will be for 2000, while a 4 year out projection will be for 2002). Column 3 also utilizes the same certainty factors described above for the other capacity components.

Document No. 8 shows that, assuming a 16.9% forecast error for the winter of 1999/2000 (Column 2), there could be a potential 3,105 MWs of load not served prior to the use of operational measures (this is a significantly lesser amount of potential unserved load both from a total MW and from a % of load perspective than occurred in 1989). The document also shows that there would be no load unserved after accounting for available operational measures. In fact, the document shows an ability to potentially serve approximately 700 MWs of additional load. With the worst-case recent historical load forecast error in Column 3, the document shows that there could be approximately 1,700 MWs of load unserved prior to the use of operational measures. The document also shows that there would be no load unserved after accounting for available operational measures, and that perhaps as much as an additional 2,142 MWs of

load could be served when such measures are implemented. Mr. Ballinger's concerns are therefore unfounded.

Document No. 9 shows that, assuming a 16.9% forecast error for the winter of 2001/2002 (Column 2), there could be a potential 1,822 MWs of load not served prior to the use of operational measures (again, this is a significantly lesser amount of potential unserved load both from a total MW and from a % of load perspective). The document also shows that there would be no load unserved after accounting for available operational measures, and that over 2,100 MWs of additional load could be served after these operational measures are implemented. With the worst case recent historical load forecast error in Column 3, there would be no load unserved even prior to the use of operational measures. Again, Mr. Ballinger's concerns are unfounded.

The information presented in Document Nos. 8 and 9 can be summarized as follows:

(1) Using more recent actual values than those from Christmas of 1989, yet assuming that the utilities still under-forecast the peak by the same 16.9% as occurred in 1989 (unlikely due to recent forecasting improvements), the projected potential unserved load prior to the use of any operational measures is still only half of what it was in 1989, when looking at the winter of 2000, and less than one-third of what it was in 1989, when looking at the winter of 2002.

(2) Once the effects of operational measures are accounted for, as they were in 1989, there is no unserved load for either the winter of 2000 or 2002, regardless of whether one assumes the same 16.9% forecast error or the more recent actual forecast errors.

These results are driven by a combination of three factors: diligence taken by the peninsular utilities to minimize planned maintenance during winter peak weeks of late December through January, improved reliability of generating units during these peak load weeks, and a greater amount of operational/other resources than was the case in 1989 (due largely to a much greater amount of residential load control capability being available). Mr. Ballinger has failed to include these factors and, for these and previously discussed reasons, has presented a misleading evaluation of what could occur in extreme weather conditions.

Q. Could you please describe your concerns with Mr. Trapp's proposals?

A. Yes. Mr. Trapp advocates a 20% reserve margin for Peninsular Florida calculated on a non-diversified load basis. He also proposes that such margin be used in determining the suitability of each utility's Ten Year Site Plans. Mr. Trapp bases his recommendations on Mr. Ballinger's analyses and the completely arbitrary selection of a reserve margin level that "minimizes the risk of capacity alerts during the summer and assures that if Florida experiences another extreme freeze like that experienced during Christmas 1989, customer outages (MW) should be no worse than that experienced during Christmas 1989." It is unclear what the basis is for Mr. Trapp's desired minimization of

capacity alerts during the summer. However, his analysis does not take into consideration of the cost of his proposal, and does not recognize the fact that the reason for alerts is to be cognizant of potential concerns and to take appropriate action, only if necessary, i.e., an alert does not necessarily result in a loss of load. Moreover, as demonstrated above, Mr. Ballinger's analyses fail to recognize improvements since 1989, disregard the substantial costs of maintaining additional reserves and are seriously flawed in many other respects.

Mr. Trapp's selection of a 20% reserve level is entirely judgmental. Trapp, p.5, lines 11 and 12. He dismisses the FRCC data and results with a mere two sentences, to the effect that Staff has independently tested the reasonableness of the FRCC seasonal peak reserve margin methodology and that he concludes the methodology is overly simplistic and does not yield credible results. Trapp, pp. 4-5. Mr. Trapp relies on analyses performed by Mr. Ballinger that are flawed and fail to recognize good utility operations and planning practices.

In order to "test" Staff's 1998 test, the FRCC replicated the alternative probabilistic methodology proposed by Staff in 1998. In 1999, the FRCC utilized the same data used by Staff in 1998 and computed similar results. During the 1998 Ten Year Site Plan review process, the FRCC had expressed concern over the Staff methodology due to the small sample size involved and the fact that Staff's implicit assumption is that all data points have an equal probability of occurrence. After replicating the Staff's 1998 analyses, the FRCC added one additional year's worth of data (1998 actuals) to the previously used 1993-1997 data. With no change to the Staff's alternative methodology, the addition of this

one additional year changes the results and conclusions of the Staff's 1998 analyses significantly.

As expected, since we are dealing with an extremely small sample size, one more year makes a significant difference in the results. For the winter 2000-2001, Staff had calculated a probability of 8.3% that there would be instances in which load would exceed resources, with an average deficiency of 1,041 MWs. The addition of the 1998 data reduced the probability of not meeting load to 2.9% and the average MW deficiency to 945 MWs. If one were to make the adjustment made by the FRCC to the winter 1993 data previously described, the results of the Staff's 1998 analysis would also be significantly altered. The corresponding probability of not serving load then changes to 1.8% and the deficiency to an average of 517 MWs. Accordingly, the FRCC's suspicions regarding the susceptibility of Staff's proposal to sample size were confirmed. An increase in sample size could arguably be used to improve confidence in the analysis, however, such an approach needs to recognize whether the sampled data is actually representative of what one is examining; e.g., previous years' data may be invalid if it is not reflective of improvements in unit forced outage rates, changes in load forecasting methodologies, etc.

The Staff's 1998 alternative methodology is flawed because it improperly assumes that each data point has an equal probability of occurrence. This ignores the fact that utilities' practices are constantly changing, making that assumption invalid. That, coupled with the non-recognition of operational measures, leads Staff to improper conclusions regarding the potential effects of

extreme weather. Nevertheless, with only a cursory reference to some unspecified independent testing of the reasonableness of the FRCC's methodology, Mr. Trapp substitutes his subjective judgment for the collective judgment and experience of FRCC's members and proposes his own "more is better" standard.

Q. Could you describe your specific concerns with Mr. Trapp's proposed reserve margin standard?

A. Yes. I have three. First, Mr. Trapp proposes to apply his 20% reserve margin as the threshold test for suitability of Ten-Year Site Plans. This is poorly conceived. As previously described, a utility with 25% or greater reserves could be seriously unreliable, while a utility or combination of utilities may be very reliable with significantly less reserves. His proposal fails to recognize these differences and attendant cost consequences under the guise of "one size fits all".

Second, Mr. Trapp is proposing that the Commission not codify his recommended 20% reserve margin into a rule at this time. Rather, he recommends that the Commission instead enforce a defacto 20% reserve margin standard in its review of Ten Year Site Plans without any rulemaking proceedings, disregarding all evidence to the contrary, based entirely on his judgment and recommendation. Needless to say FRCC strongly disagrees with Mr. Trapp's proposal.

Third, we are concerned with Mr. Trapp's proposal to include uncommitted

capacity in reserve margin calculations. Mr. Trapp proposes to include "quantifiable" non-firm purchases and uncommitted capacity in determining whether his proposed 20% reserve margin criteria has been met. Trapp, p.7, lines 19-22. However, he will not recognize in such determination the impact of load diversity on the total load to be served (even though it is quantifiable and an accepted planning factor).

Mr. Trapp states that he finds it surprising that the FRCC has not proposed or developed methodologies to measure the likely contribution of these non-committed generation resources to the adequacy of the Peninsular Florida system. Trapp p.7, lines 7-10. Mr. Trapp is incorrect. The FRCC has a methodology to recognize the reliability contributions of such and other resources; it is called Loss of Load Probability. The FRCC, however, has not included such resources in those analyses to date, even though it discussed the issue, because the LOLP is already extremely low assuming only the availability of existing resources. A summary of the FRCC's 1999 LOLP analyses results is presented in my Document Nos. 10 and 11.

If Mr. Trapp considers it appropriate to count uncommitted capacity toward the reserve margin, then perhaps he could also count as-available QF capacity, non-firm purchases from both within and outside the state and operational resources available to utilities, all of which have a better history than Mr. Trapp's uncommitted capacity. If one were to include load diversity and the type of resources described above in reserve margin calculations, the FRCC's projected reserve would probably exceed 20% for each of the next ten years. The FRCC,

however, does not believe that this is appropriate.

Mr. Trapp's uncommitted capacity proposal presents several implementation problems as well. For example, while he proposes the inclusion of such capacity, since 1997 some utilities have been criticized by Staff for including unspecified resources in their plans, regardless of how far out in time those resources may be (indeed, Mr. Ballinger identifies this concern as part of the genesis of this docket). Apparently, as long as a resource is identified, a contract will not be required by Mr. Trapp. This then raises a question with regards to which utility(ies) gets to claim the uncommitted, yet identified, resource. The FRCC goes to great lengths to make sure that MWs are not double counted in its reserve margin calculations. Uncommitted capacity could create double counting problems. Moreover, if a resource is uncommitted, how is one assured that the resource will be available to the utility claiming the resource or to the State? Just because an uncommitted resource was there yesterday does not mean that it will be there tomorrow. Reliance on such resources for reserve margin purposes is not appropriate.

Q. Do you have any other concerns with Mr. Trapp's proposals?

A. Yes. I'd like to comment on three additional items: Mr. Trapp's concerns over reliance on non-firm load for reserve margin purposes; his dismissal of other Reliability Council's reliability criteria; and his suggestion that the FRCC evaluate the potential impact of out of Peninsular Florida sales interfering with the availability of Peninsular Florida reserve capacity.

Mr. Trapp criticizes FRCC for not independently addressing the non-firm load issue. Trapp pp. 11-12. His criticisms are misplaced. First, FRCC utilities have embraced demand side programs at the urging of this Commission, and in accordance with its directives and goals as to the amount and cost-effectiveness of such resources. In fact, the Commission's DSM Goals require all cost-effective DSM to be implemented. Second, to the extent that utilities have observed customer reluctance to continue with such programs, they have either addressed such issue in their forecasts of non-firm load or sought replacement customers for those expressing dissatisfaction. The FRCC's analyses and reports merely reflect individual utility plans with Commission approved programs. The FRCC does not see this as an issue at this time.

With respect to Mr. Trapp's dismissal of other Reliability Council's reliability criteria, it should be noted that reference to such criteria was included as an issue in this docket at the urging of intervenors, and with the acceptance of Staff. The criteria of other Reliability Council are consistent with the FRCC criterion, and accepted over the course of time by various reliability organizations, yet Mr. Trapp distances himself from those criteria because he does "not know the full circumstances which exist in other regions". Even though he does "not know the full circumstances which exist in other regions," he notes that "many other regions allow the construction of merchant plants which provides an added cushion to their generating capacity reserves." Trapp p. 15, lines 9-22. The construction of merchant plants is not the issue in this docket. Reserve margins are. As of yet, there has been no justification to include uncommitted capacity in reserve margin calculations.

Q. Does this conclude your testimony?

A. Yes, it does.

Document No. 11

1999 FRCC LOLP Projections

1999 LOLP Sensitivities
(Days/Year)

YEAR	No Direct Load Control	No SERC Assistance Jan. – Dec.	3% Steam EFOR Increase	Winter Demand Sensitivity	Summer Demand Sensitivity
1999	0.084548	0.001127	0.012571	0.041667	0.001256
2000	0.086074	0.001658	0.009833	0.031545	0.001214
2001	0.018625	0.001376	0.007246	0.006537	0.000205
2002	0.003645	0.000158	0.001477	0.001562	0.000051
2003	0.001184	0.000043	0.000680	0.000598	0.000029
2004	0.001954	0.000063	0.001041	0.001158	0.000069
2005	0.004167	0.000108	0.001325	0.003051	0.000142
2006	0.006058	0.000176	0.002133	0.004317	0.000387
2007	0.003626	0.000046	0.000663	0.003595	0.000156
2008	0.002591	0.000034	0.000592	0.003013	0.000150

Document No. 10

1999 FRCC LOLP Projections

Year	Reference Case Existing Certified Planned And Proposed (Days/Year)	No Unit Additions Existing And Certified Only (Days/Year)
1999	0.000095	0.000095
2000	0.000082	0.000084
2001	0.000052	0.001512
2002	0.000005	0.001607
2003	0.000000	0.002350
2004	0.000001	0.017748
2005	0.000002	0.168123
2006	0.000004	0.913854
2007	0.000000	3.892987
2008	0.000000	12.130914

Document No. 9

History and Projections of Winter 2002 Reserves

	(1) Staff's Calculations for Christmas of 1989	(2) FRCC Projections for Winter 2002 based on the FRCC's 1999 Load & Resource Plan	(3) FRCC Projections for Winter 2002 based on the FRCC's 1999 Load & Resource Plan
		w/ FRCC forecast plus Xmas 89 % error	w/ FRCC forecast plus recent historical error
I. Capacity (MW)			
a) Utility Capacity	33,973	41,549	41,549
b) Unavailable Utility Capacity (Planned Maintenance)	3,566	158	158
c) Unavailable Utility Capacity (Forced Outage)	4,333	2,659	2,659
d) Total Unavailable Utility Capacity (=b+c)	7,899	2,817	2,817
e) Total Unavailable Utility Capacity (%)	**23.3%**	**6.8%**	**6.8%**
f) Firm Imports	2,400	1,671	1,671
g) Firm Imports Availability	-----	**99.9%**	**99.9%**
h) Firm QF	247	2,129	2,129
i) Firm QF Availability	-----	**91.9%**	**91.9%**
j) Total Capacity Available (=a-d+f*g+h*i)	28,721	42,358	42,358
II. Firm Load (MW)			
k) FRCC's Base Forecast Firm Load (non-coincident)	29,752	37,793	37,793
l) Xmas 89 peak	34,776	-------	-------
m) Firm Peak % error Xmas 89/FRCC worst recent error	16.9%	16.9%	**10.5%**
n) FRCC's Revised Forecast of Firm Load based on Xmas 89 or worst recent historical error	-----	44,180	**41,761**
o) Potential Load Not Served prior to use of Operational Measures (= l - j or n - j)	6,055	1,822	-596
III. Operational/Other Measures Not Accounted for in Reserve Margin Calculations (MW) (public appeals to conserve, etc.)			
p) Total of Operational/Other Measures	1,311	3,945	3,945
IV. Load Not Served			
q) Actual/Projected Load Not Served after use of Operational/Other measures	4,744	0	0
r) Additional Load which can be Served after operational measures (= p - o)	------	2,123	4,541

Notes: - row b values for Cols. 2 & 3 reflect the average planned maintenance values for the last week of December 1998 and all 4 weeks of January 1999 as shown on the FRCC's 12/4/98 projections.
- rows c,g, and i reflect the historical data reported in the FRCC's 1999 Reserve Margin Analysis.

Document No. 8

History and Projections of Winter 2000 Reserves

	(1) Staff's Calculations for Christmas of 1989	(2) FRCC Projections for Winter 2000 based on the FRCC's 1999 Load & Resource Plan	(3)
		w/ FRCC forecast plus Xmas 89 % error	w/ FRCC forecast plus recent historical error
I. Capacity (MW)			
a) Utility Capacity	33,973	37,803	37,803
b) Unavailable Utility Capacity (Planned Maintenance)	3,566	158	158
c) Unavailable Utility Capacity (Forced Outage)	4,333	2,419	2,419
d) Total Unavailable Utility Capacity (=b+c)	7,899	2,577	2,577
e) Total Unavailable Utility Capacity (%)	**23.3%**	**6.8%**	**6.8%**
f) Firm Imports	2,400	1,772	1,772
g) Firm Imports Availability	-----	**99.9%**	**99.9%**
h) Firm QF	247	2,129	2,129
i) Firm QF Availability	-----	**91.9%**	**91.9%**
j) Total Capacity Available (=a-d+f*g+h*i)	28,721	38,952	38,952
II. Firm Load (MW)			
k) FRCC's Base Forecast Firm Load (non-coincident)	29,752	35,977	35,977
l) Xmas 89 peak	34,776	-------	-------
m) Firm Peak % error Xmas 89/FRCC worst recent error	16.9%	16.9%	**13.0%**
n) FRCC's Revised Forecast of Firm Load based on Xmas 89 or worst recent historical error	-----	42,057	**40,654**
o) Potential Load Not Served prior to use of Operational Measures (= l - j or n - j)	6,055	3,105	1,702
III. Operational/Other Measures Not Accounted for in Reserve Margin Calculations (MW) (public appeals to conserve, etc.)			
p) Total of Operational/Other Measures	1,311	3,844	3,844
IV. Load Not Served			
q) Actual/Projected Load Not Served after use of Operational/Other measures	4,744	0	0
r) Additional Load which can be Served after operational measures (= p - o)	------	739	2,142

Notes: - row b values for Cols. 2 & 3 reflect the average planned maintenance values for the last week of December 1998 and all 4 weeks of January 1999 as shown on the FRCC's 12/4/98 projections.
- rows c,g, and i reflect the historical data reported in the FRCC's 1999 Reserve Margin Analysis.