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: August 16, 1999

DIRECT TESTIMONY

OF JOHN B. CRISP

ON BEHALF OF

FLORIDA POWER CORPORATION

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DIRECT TESTIMONY OF JOHN B. CRISP

Q. Please state your name and business address.

A. My name is John B. Crisp, and my business address is 100 Central Avenue, St. Petersburg, Florida, 33701

Q. By whom are you employed and in what position?

A. I am the Director of Integrated Resource Planning and Load Forecasting for Florida Power Corporation (FPC).

Q. What are your duties and responsibilities in that position?

A. My responsibilities include coordinating the analysis and development of load forecasts and integrated resource plans. This includes among other things interfacing with the Florida Reliability Coordinating Council (FRCC), overseeing national and state regulatory reporting, evaluating generation performance, analyzing supply methods, evaluating and implementing demand side management (DSM) programs, and analyzing customer load categories. I am also

responsible for developing market based load and resource planning skills to prepare the company to respond appropriately to power industry restructuring.

Q. Please summarize your educational background and employment experience.

A. I attended the Georgia Institute of Technology in Atlanta, Georgia. I received a Bachelor of Science degree in Industrial and Systems Engineering in 1975. As part of the requirements for my job at Oglethorpe Power Corporation, I also completed Georgia Tech's International Management Executive Program in 1990.

My power industry employment began with Oglethorpe Power Corporation in 1988, where I was involved in the management of peaking generation, generation planning, operations planning, load forecasting, integrated resource planning, and strategic and business planning. I also developed and implemented strategies for asset leasing and fixed price contract supply, and implemented an operations resource planning and marketing system for sales of excess generation capacity and energy.

After leaving Oglethorpe Power in 1995, I joined an Independent Power Producer, Tenaska Inc., as its Manager of Power Services Development. In this position, I was responsible for developing, marketing, and implementing

proposals for peaking and combined cycle facilities that served wholesale requirements and cogeneration functions. In February 1997, I joined Dynegy Marketing and Trade (then known as Electric Clearinghouse) in a start-up position in their Atlanta field office. In this position, I coordinated the development and implementation of power marketing strategies in SERC and FRCC. I was responsible for market analysis, deal identification and prioritization, capacity and energy pricing, negotiations, portfolio balance, and achievement of revenue and profit objectives. I also assisted Dynegy with field alliance development, power plant and asset acquisition, merchant market evaluation, merchant plant siting, power plant marketing, and strategic asset deployment.

In May 1999, I joined Florida Power Corporation.

SUMMARY AND PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. I am testifying for FPC on the issues identified by the Commission in its Generic Investigation into the aggregate electric utility reserve margins planned for Peninsular Florida. My testimony addresses, in turn, each of the nineteen (19)

issues recited in the Order Clarifying Scope of Proceeding; Docket Procedures; and Establishing Issues dated July 1, 1999.

Q. Please summarize your testimony.

A. FPC plans its resources to ensure a minimum 15% reserve margin, forecasted over seasonal winter and summer peak demand. (FPC also seeks to satisfy an assisted Loss of Load Probability (LOLP) criterion of 0.1 days per year.) FPC's methodology for calculating reserve margins is consistent with both the formula set forth in FPSC Rule 25-6.035 and the FRCC's methodology, and may be reflected as follows:

Reserve Margin (%) = [(Total Firm Capacity – Peak Firm Demand)/Peak Firm Demand)] x 100

In making this determination, FPC and FRCC define Total Firm Capacity to include only firm supply resources. Non-firm supply resources, such as unsubscribed portions of qualifying facilities and purpose-built merchant plants, may not be counted on to serve peak loads within Peninsular Florida.

In assessing load, FPC evaluates individual components of customer load, which include retail load, retail Energy Management capability, retail interruptible

capability, and firm wholesale requirements. A firm load forecast is then developed and adjusted for peak coincidence. Peak coincidence and the resulting seasonal peak load will vary from utility to utility.

Each utility must balance Direct Load Control (DLC) programs with other resources to ensure that appropriate levels of reliability and customer satisfaction are maintained. Because utility-specific considerations such as customer preferences, customer demographics, and customer responses to program design and tariff provisions drive this analysis, generic prescriptions or caps are not appropriate.

Likewise, lead times for generation development must be appropriate and must be determined by each utility based on its individual circumstances. A generic accommodation for equipment delays is not warranted.

Similarly, historical weather conditions must be analyzed for FPC's projections of seasonal peak load. FPC's methodology is unique to its service territory and integrates adjustments peculiar to FPC's peak load usage patterns.

For all these reasons, promulgating formal reserve margin requirements or imposing a particular methodology on individual utilities would not be

appropriate or beneficial. Each utility must balance a unique set of supply, demand, and economic circumstances in the context of specific customer demographics and relationships, system size, the size and flexibility of supply resources, and unique geographic and weather conditions to determine the best manner of meeting its obligation to maintain adequate power resources at a reasonable cost. The Commission's review of each utility's 10 Year Site Plan on an annual basis continues to be the most effective way to evaluate the adequacy of a particular utility's reserves and affords the Commission a timely and meaningful opportunity to address any perceived planning problems on a utility by utility basis.

Similarly, the FPSC does not need to establish any formal regulatory standards relating to aggregate reserve margins at this time. The FRCC has adopted a 15% planning reserve margin standard for Peninsular Florida (supplemented by an LOLP analysis). Using this reserve margin standard, the FRCC is able to evaluate and ensure the aggregate existence of adequate reserves on an annual basis. In addition, FPSC Rule 25-6.035 establishes an equitable reserve sharing standard that requires each utility to maintain a minimum 15% planned reserve margin in order to qualify for the sharing of energy reserves. These existing approaches are consistent with industry standards used throughout the country and constitute an

appropriate and adequate means to ensure a continuing reliable power supply in Peninsular Florida.

Issue 1

Q. How does FPC calculate reserve margins?

A. FPC's methodology of calculating reserve margins follows the traditional and generally accepted approach of assessing supply reserves available above and beyond the forecasted seasonal firm demand requirements of FPC's retail customers and FPC's firm load obligations in the wholesale (sales for resale) arena. FPC's formula for calculating reserves is similar to and consistent with the formula set forth in FPSC Rule 25-6.035. The formula may be denoted as follows:

Reserve Margin (%) = [(Total Firm Capacity – Peak Firm Demand)/Peak Firm Demand)] x 100

The supply resources (Total Firm Capacity) accounted for in this assessment include FPC's own generating resources as well as resources under firm first call contracts to FPC (*e.g.*, QF contracts, unit power purchases, contract power purchases). The Peak Firm Demand is based on the total potential customer load

that could occur (if supply resources were available) less the ability FPC has to reduce its load through Energy Management and interruptible customer programs.

Q. Does FPC support the Florida Reliability Coordinating Council's (FRCC) methodology of calculating reserve margins for Peninsular Florida?

A. Yes. FPC performs its reserve margin calculation the same way that the FRCC does. FRCC's methodology continues to be an appropriate means to calculate reserve margins for planning purposes.

Issue 2

Q. What is the appropriate methodology, for planning purposes, for evaluating reserve margins for individual utilities?

A. An individual utility, like FPC, will apply appropriate engineering and economic judgment and take into account available industry standards (*e.g.*, prevailing reserve margin or LOLP criteria) to evaluate the significance of past operational experience and the existing and anticipated structure of the utility's power resources to plan for appropriate reserves in the future. At present, FPC uses the dual criteria of a minimum 15% reserve margin and 1 day in 10 years assisted

Loss of Load Probability (LOLP), each of which has been in effect since 1991. Assisted LOLP includes the ability to receive power from other utilities and is based on an industry standard that has been discussed in FPC's 10 Year Site Plans for quite some time. Using these (dual) criteria, FPC has maintained a consistently reliable supply of power. Of these criteria, the minimum 15% reserve margin generally drives FPC's resource requirements.

Q. Should FPC or other individual utilities be required to use a specific planning criterion to assess generation adequacy? If so, what should it be?

A. No. Each utility has a unique set of circumstances upon which it must choose to establish its long-term planning approach.

Utility-Specific Circumstances

To elaborate, in connection with its planning process, each utility must balance a unique set of supply, demand, and economic circumstances. As a result, utilities have adopted different criteria to capture the balance that is appropriate for their customers and the unique characteristics of their systems. Utilities have also, as circumstances warrant, adjusted or changed their criteria. These utility-specific planning factors depend, to a large extent, on specific customer demographics and

relationships, the size of the utility's system, the size and flexibility of the utility's supply resources, its unique geographic and weather circumstances, and so on. To date, no unified criteria or methodology has emerged as appropriate for all utilities under all circumstances. It would be overly prescriptive to mandate a particular approach for all utilities, disregarding the unique circumstances for which they must plan.

Florida Public Service Commission (FPSC) Staff Review Process

Mindful of these concerns, the FPSC and its Staff have reviewed each utility's 10 Year Site Plan for many years to assess resource and reserve adequacy. Each year, the Staff reviews individual utility plans, compares them to that utility's past plans, and then comments on the adequacy impacts of its findings. The FPSC Staff has made specific follow-up inquiries, routinely and on an *ad hoc* basis, to the individual utilities for clarification and supplementation to assure adequacy and ultimately to support the FPSC findings regarding the adequacy of each utility's plan. Through this process, the FPSC has effectively implemented its mandate to ensure the continuation of a reliable and adequate electrical power supply in the State of Florida at a reasonable cost. This individualized approach remains appropriate today because, unlike a prescriptive mandate, it permits the

FPSC to identify and evaluate annually the unique circumstances faced by each utility in the State, and it provides the Commission with the opportunity to order the development or acquisition of additional resources if a specific problem is identified.

Existing Criteria and/or Standards

Further, at the present time, there are already criteria in place that help govern the planning processes of the utilities in Florida. One of these is the FRCC's 15% planning reserve margin standard for Peninsular Florida. Consistent with this, FPSC Rule 25-6.035, although it does not set a standard, does requires Peninsular Florida utilities who participate in reserve sharing to "maintain, at a minimum, a 15% planned reserve margin." These structural criteria function as strong incentives to individual utilities in assessing and setting their own reserve requirements. Beyond these structural criteria, each of the utilities is also balancing its own requirements to meet its customers' expectations.

In summary, no formal mandatory planning criteria are needed at this time. If there are specific utility plans that are out of balance, the FPSC may address these on an individual basis.

Q. What is the appropriate methodology, for planning purposes, for evaluating reserve margins for Peninsular Florida?

A. The FRCC appropriately evaluates reserve margins for Peninsular Florida. As a member of the North American Electricity Reliability Council (NERC), the FRCC and its membership have taken responsibility for developing various forms of system reliability assessments for the State and Peninsular Florida. One of these is a resource adequacy assessment.

As its primary benchmark for ensuring adequacy through this assessment, the FRCC has adopted a 15% reserve margin standard for Peninsular Florida. FRCC also employs a traditional LOLP assessment of the aggregated Peninsular Florida load for the forecast horizon (which has historically yielded adequate results even with reserve margins at lower levels) to enhance certainty concerning the adequacy of Peninsular Florida reserves. This "belt and suspenders" approach should serve the State well. Likewise, the FRCC's continuing efforts to support the reserve margin target through its review process should serve to reinforce the confidence of the State's utilities and the Public Service Commission.

Issue 3

Q. What capacity (supply resources) should be included in reserve margin assessments?

A. Only firm supply resources should be included, as discussed herein.

Firm Supply Resources

Reserve margins for the region are intended to include resources that are dedicated to service within Peninsular Florida during seasonal peak periods as they are needed. These would include the generating resources and the contract supply resources serving under firm provisions on behalf of utilities serving retail load in Peninsular Florida. Also, if any of these utilities has firm load requirements outside Peninsular Florida then those loads should be included in the respective utility's load to ensure that the resource impact is captured.

Non-Firm Supply Resources

Resources that are not committed to retail utilities in Peninsular Florida should not be included in the reserve margin assessment since they may not be counted

on to serve peak loads within Peninsular Florida. This was clearly delineated in FPSC Order No. PSC-94-1256-FOF-EU, which states that "non-firm purchased power shall not be included in the calculation of reserves." This may include unsubscribed portions of qualifying facilities and purpose-built merchant plants that are unconstrained and available to pursue the greatest economic opportunity inside or outside Peninsular Florida.

From time to time, utilities may also purchase power on a non-firm basis. These purchases most commonly occur as short-term transactions (less than 1 year) but might extend for longer periods. The primary objective of these non-firm purchases is ordinarily to reduce overall cost. In order to maintain reliable supply, utilities must ensure that they have sufficient resources to back up these purchases if they are interrupted. For these reasons, utilities should not count non-firm resources in their reserve margin assessments.

Q. Are the lead times for generation development properly accounted for?

A. When utilities plan for future resource requirements, they must consider many factors in determining what resources would best meet the needs of their customers. One of these factors is the lead time required to certify, license, and construct the physical plant. FPC addresses these time requirements in its

planning process to account for regulatory time lines and for equipment deliveries. Given the many factors in play (*e.g.*, plant sites, technology, regulatory requirements, equipment options, system economics), a generic accommodation for equipment delays is neither warranted nor appropriate. However, each utility must appropriately account for these dynamics in its planning process. Any concerns relating to timing issues can be addressed by the FPSC on a case by case basis, as has been the practice in the past.

Q. Over what period (hourly, 30 min., 15 min.) should the seasonal firm peak demand be determined?

A. Unless there is some special consideration, seasonal firm peak demand should be assessed by each utility over an integrated one-hour period. That is the most accessible form of the data and is common industry practice as well.

Q. What is the proper method of accounting for the diversity of the individual utilities' seasonal firm peak demands and load uncertainty? Is sufficient load uncertainty data available and being used?

A. For assessment of load, FPC develops forecasts for each of the individual components of customer load, including retail load, retail Energy Management

capability, retail interruptible capability, and firm wholesale requirements. When these components are aggregated, the firm load forecast is then developed by deducting the non-firm components (Energy Management and Interruptible) from the total potential load of all customers (firm and non-firm).

Peak Coincidence

Since each of these customer load components will peak at different times due to different usage patterns, geographic diversity, and variable weather impacts, the aggregated forecast must then be adjusted by a degree of coincidence to establish FPC's "coincident" peak demand forecast. To accomplish this, the historical load shapes are analyzed to determine the degree of coincidence among the components of customer load. Significant historical weather databases reveal, through analysis, that customer group peaks have been and will continue to be fairly diverse given the weather patterns normally driving system peaking conditions. For long-term planning purposes, these peaking components are aggregated into a "coincident load" utility forecast where the peak coincidence among customer groups has been accounted for. A similar diversity of peaking characteristics also exists among the utilities in Florida, and the FRCC addresses these coincidence factors in its reserve margin analysis process.

Load Uncertainty

From an individual utility standpoint, FPC has been studying weather uncertainty and load response to weather for over 25 years. Using extensive weather databases and fairly comprehensive load forecasting techniques that link system response to weather conditions, FPC has developed a reliable process for estimating system peaks under varying conditions. This capability allows FPC to examine a range of potential peak forecasts (from "mild" to "expected" to "extreme") and to develop, based on the historical weather patterns and customer usage patterns, a "normal" (expected value) peak forecast pattern. This forecast information has been appropriately integrated into the planning process.

When the FRCC aggregates the analogous forecast data from all of the utilities, it takes reasonable measures to ensure the consistency and appropriateness of the aggregate results. This includes aggregation of both forecast and historical data. The resulting load uncertainty values developed by the FRCC will change from year to year, depending on the different weather patterns observed. However, there is enough weather history available (with load correlation from each utility) to assess a reasonable uncertainty over time.

Q. How are interruptible, curtailable, load management, and wholesale loads treated at the end of their tariff or contract termination period?

A. **Direct Load Control (DLC) Programs**

In FPC's forecasts, Direct Load Control (DLC) programs like load management and interruptible service are assumed to continue during the forecast periods. Each program has a specific forecast of customer participation patterns and rates that will include the impact of any sunset provisions that might exist. For the interruptible programs, there are specific notice provisions for customers to opt out, which allow enough time for FPC to adjust the supply mix to firm up supply if necessary. This allows FPC to forecast continuing participation until notice has been given. Due to the significant portion of interruptible load in the mining sector, additional measures are taken to forecast usage pattern and business cycle impacts on potential interruptible capability in future years. Utilities must closely monitor participation in all such programs and adapt as needed to changes in participation rates.

Wholesale Contracts

Wholesale contracts, by their nature, are not generic. They are developed on a case by case basis to meet specific needs (*e.g.*, stratified loads, partial requirements, full requirements) and, as such, should not be subject to generic or uniform treatment. It is incumbent on both the load serving utilities (wholesale purchasers) and the wholesale suppliers to plan properly for their respective needs based on their intimate knowledge of the individual contracts and/or tariff terms and conditions, including continuation, renewal, and/or termination. In FPC's case, wholesale requirements customers are projected to continue purchasing for the relevant contract period, unless notice has been given to reduce or terminate such contract. Most other wholesale contracts are purpose specific and contain terms and conditions specific to expiration, notice, and termination. These contracts are dealt with on a case by case basis, depending on the specific customer relationship and contract terms.

When the FRCC aggregates all of the utilities' load forecasts, it uses a reconciliation process to determine which contract loads are being served by each utility. If a contract expires, the load serving utility will identify where resources will be obtained to replace the original supplier. If these sources are unspecified

further out on the long-term planning horizon, then the reserves in that time frame may drop until sources are confirmed closer to utility commitment dates.

Q. How should demand and/or energy use reduction options be evaluated and included in planning and setting reserve margins?

A. Each utility must determine the appropriate mix of resources to achieve the level of reliability and customer satisfaction necessary to maintain a viable presence. If customers are willing to allow their utility to control portions of their usage pattern, then the utility will incorporate the economic trade-offs in its supply formula into the incentive provisions that are developed for each program. FPC's Energy Management and interruptible power programs have been developed to offer qualifying customers a set of incentive options for their supply requirements in exchange for reducing the priority on their power supply. Since the underlying benefits of these programs are based on deferral of new generation, these program participants must shift to a non-firm supply status. As a result, the portions of their supply requirements that are shifting to non-firm do not require firm resources or reserves, and are therefore removed from the firm load forecast.

Since FPC's reserves provide for both weather uncertainty and generation resource unavailability, there are clearly going to be opportunities to continue to serve these non-firm loads when the generating resources are available. However, this is not a material factor in setting reserve margins required to reliably serve FPC's firm load requirements.

Reliance on DLC programs may be adjusted over time based on customer preferences, customer demographics, and customer responses to program design and tariff provisions. These considerations are company-specific. Therefore, these issues should be dealt with by each utility individually as it balances its resource mix.

Q. Should a percent reserve margin planning criteria be determined on an annual, seasonal, monthly, daily, or hourly basis?

A. For long-term planning, FPC and the FRCC currently assess reserve margins on a seasonal basis. Given that the weather driven peak system demand conditions can occur in Florida in both the summer and winter, the current seasonal review remains appropriate for the long-term planning process.

Reserve margins and resource considerations are also used for other purposes, outside of the long-term planning process. For example, the annual peak reserve margin is still an appropriate measure for examination of aggregate reserve adequacy, as delineated in 25-6.035. Another example, at a system operating level, is the FRCC's year-ahead review of monthly reserve levels. This review process is appropriate for identification and management of any outage timing conflicts that may be discovered. In summary, the appropriate time frame for reserve margin assessment depends on the issues being examined. For long-term planning, seasonal assessments seem most appropriate.

Issue 4

Q. How should generating units be rated (MW) for inclusion in a percent reserve margin planning criteria calculation?

A. FPC has been using plant rating conventions established many years ago when Florida was a sub-region of the Southeast Reliability Coordination Council (SERC). FPC files plant ratings with the FPSC, the FRCC, and the Federal Government using the SERC rating conventions for seasonal capacity. These ratings are based on actual plant test data for reliable operations at 40°F (winter) and 90°F (summer), per the convention. For purposes of long-term planning with

"normalized" weather peak forecasts (*i.e.*, normalized as an average over an historical period), this convention remains appropriate. If extreme weather impacts are being considered in special studies, more specific adjustment of generating unit capability may be necessary for consistency with the study conditions (but these adjustments would be inappropriate if applied back for long-term planning).

Issue 5

Q. Should individual utility's reserve margins be integrated into the aggregated reserve margin for Peninsular Florida?

A. No. The individual utility reserve margins should not be integrated. Rather, the individual utilities' firm supply resources and firm load obligation forecasts should be aggregated to a Peninsular Florida level. Then the reserve margins can be determined in the same manner as the individual utility reserve margins are calculated. This aggregation process at the FRCC for resources and load properly accounts for shared resources, inter-utility supply arrangements, load control resources, and peak load diversity.

Issue 6

Q. Should there be a limit on the ratio of non-firm load to MW reserves? If so, what should that ratio be?

A. No. There should not be a limit imposed on non-firm load. These arrangements are developed between suppliers and customers on a case by case basis and should not be prescribed or limited by regulatory mandate. These programs have been strongly encouraged and supported by the FPSC, and have been a successful component of utilities' portfolios. Each utility must continually strive for an appropriate balance of trade-offs between load control programs and physical generation. These considerations are utility-specific, based on program design and tariff provisions, and cannot be addressed effectively under a general regulatory prescription or cap provision. Rather, these issues should be dealt with by each utility individually, as it balances the resource mix in its long-term planning process.

Issue 7

Q. Should there be a minimum of supply-side resources when determining reserve margins? If so, what is the appropriate minimum level?

A. No. Like Issue 6, this question again seeks to limit the mix of supply resources and load control in determining reserve margins. There should not be a mandated minimum for supply-side resources for individual utilities or the FRCC. Each utility must define the relationship with its customers who are willing to accept lower priority service in exchange for economic incentives. Each utility must then account for these customer-specific relationships and agreements in its long-term planning process.

As a point of clarification, this concept would seek to establish a minimum threshold of supply-side resources when the total resources are compared with the total potential load (before load control options are exercised). Depending on the mix, or ratios, of supply- and demand-side resources, a mandated threshold of supply-side resources could force a utility to provide supply resources for the purpose of serving non-firm load. This could potentially defeat the purpose of developing demand-side programs, which provide incentives that defer generation needs. As these issues are examined at deeper levels, it becomes more and more evident that these are utility- and customer-specific issues (due to the unique relationships among customer demographics and preferences, the particular utility's program designs, and the overall relationship with price and reliability of the product). If, after balancing all of these factors in its planning process, a

particular utility deems it appropriate to establish a supply-side resource threshold, that decision would be supported by a more appropriate set of utility-specific facts.

At the Peninsular Florida level, the FRCC should simply aggregate the loads along with the demand-side and supply-side resource plans submitted by each of the individual utilities.

Issue 8

Q. What, if any, planning criteria should be used to assess the generation adequacy of individual utilities?

A. Please refer to FPC responses to Issue 2.

Issue 9

Q. Should the import capability of Peninsular Florida be accounted for in measuring and evaluating reserve margins, both for individual utilities and for Peninsular Florida?

A. Yes, the portions of the interface that are committed to firm supply contracts should be accounted for. To this extent, the import capability of Peninsular Florida is already accounted for in the reserve margin assessments of the individual utilities and the FRCC. Several Florida utilities include (in their firm resource mix) owned and/or contracted generation from outside of the FRCC Region that flows in through the Florida/Georgia interface. The reserve margin assessments account for only the resources outside Peninsular Florida that are either owned by, or under firm contract to, load serving utilities in Florida. The remainder of the Florida-bound interface capability (which is not under contract) is not counted in the reserve margin assessments. If additional firm supply resources are matched with the remaining Florida-bound interface capability, the result would then be included in the reserve margin assessments.

Q. Should the import capability of Peninsular Florida be accounted for in measuring and evaluating reliability criteria, other than reserve margins, both for individual utilities and for Peninsular Florida?

A. Yes. FPC performs LOLP analysis in addition to reserve margin calculations to address reliability. In the LOLP analysis, FPC addresses its supply capability on a self-sufficient (isolated) basis and on an assisted basis. For the assisted LOLP

calculations, FPC assumes that non-firm imports would potentially be available through FPC's interfaces with other utilities. For FPC, there is a small (residual) component of the Florida/Georgia interface available in its total interface capability that remains after the firm imports from Southern Company are accounted for.

The FRCC's statewide LOLP analysis also includes an assistance component based on the unsubscribed portion of the Florida/Georgia interface for the State as a whole. This statewide analysis assumes that power will be available to Florida utilities through the unsubscribed Florida-bound interface if capacity were tight in Florida and there were a potential for unserved firm load.

Issue 10

Q. Does Florida Power Corporation appropriately account for historical winter and summer temperatures when forecasting seasonal peak loads for purposes of establishing a percent reserve margin planning criterion?

A. Yes. FPC projections of seasonal peak demand use the most appropriate measure of historical weather conditions that have impacted the historical recorded

seasonal peaks in the FPC service territory. Two important factors that FPC focuses on when measuring weather impacts upon seasonal peak are, first, specifying weather variables that best explain variation in historical seasonal peak, and second, incorporating the most reasonable range of values in the development of "normal" weather. FPC's seasonal peak models incorporate weather conditions that meet both criteria. This approach not only accounts for the geographic location of the load, but also a "duration effect" that captures customer behavior related to specific weather events.

To properly measure weather effects upon MW load, it is important to match the weather conditions most closely to the load level experienced. FPC's methodology captures this in several ways. First, FPC utilizes temperatures from the three major weather stations located within the service territory. Each station's temperature reading is weighted based upon the amount of weather sensitive load closest to each weather station. Second, FPC utilizes temperatures that occurred at the time of the peak during the last 20 years. Since the seasonal peak is an integrated hourly demand, an average of the temperature readings in the hour beginning the peak hour as well as the reading at the end of the peak hour best measure temperature conditions.

In order to derive the most proper historical weather condition impacting seasonal peak demand, FPC takes an additional step further refining its analysis. Research has shown that customer behavior relative to weather conditions is also influenced by temperatures leading up to the hour of peak. It is this "duration effect" that captures additional variation in peak demand, beyond what is captured by using temperatures solely in the hour of the peak. FPC's research has shown that, for winter weather conditions, a weighing of the two-hour average around the peak hour, and the 24-hour average ending with the peak hour, effectively accounts for most of the winter peak variation. In the summertime, a 5-hour average ending with the peak hour shows a similar improvement in forecast quality.

Issue 11

Q. Is the FRCC's 15% reserve margin planning criterion an appropriate measure for the review of generation adequacy on a Peninsular Florida basis?

A. Yes. The FRCC's current 15% reserve margin standard and its underlying analysis are appropriate measures for examining supply adequacy for Peninsular Florida. The concept of using reserve margin as a supply adequacy standard is

well tested and is used in many of the NERC Regions across the country. As outlined in the FRCC's exhibit in response to FRCC Interrogatory #11 attached hereto as exhibit JBC-1, the FRCC's 15% reserve margin standard is consistent with several other NERC Regions that use reserve margin standards. Further, the use of reserve margins (and other reliability criteria) is generally not tested mathematically but rather validated empirically over years of successful and reliable operations.

Issue 12

Q. What percent reserve margin is currently planned for FPC?

A. FPC is currently using long-range resource planning criteria of a minimum 15% reserve margin and 0.1 LOLP to best represent FPC's reliability requirements.

Q. Are FPC's long-range planning criteria sufficient to provide an adequate and reliable source of energy for operational and emergency purposes in FPC's service area?

A. Yes. Both of FPC's criteria are traditional utility planning measures that have

served FPC and other similar utilities throughout the country reasonably well. The reserve margin table below provides the planned values from FPC's current 10 Year Site Plan.

FPC Corporation

1999 10 Year Site Plan

Seasonal Reserve Margins

Filed 4/1/99

	Planned Winter Reserve Margin	Planned Summer Reserve Margin
2000	16%	18%
2001	17%	17%
2002	18%	19%
2003	24%	25%
2004	20%	21%
2005	22%	23%
2006	19%	19%
2007	23%	22%
2008	19%	18%

The resource plan outlined in the 10 Year Site Plan provides for adequate, reliable, and economic energy to meet the needs of FPC's dynamic service area. The Plan accommodates the anticipated growth in the number of customers and average consumption per customer. The Plan also accommodates changes that

are occurring in the wholesale market and the impact that those changes will have on FPC's wholesale contract sales. FPC is currently forecasting declines in the demand and energy requirements of its wholesale customers based upon an increase in the diversity of their supply mix and the availability of alternative suppliers.

The reserve margins included in these plans accommodate FPC's day to day operational requirements as well as provide additional support for extreme weather demands or supply resource outages. Given the size of FPC's Energy Management and Interruptible Service programs, these demand-side resources are an important component in the resource mix and will be called upon to meet these needs.

Operational Measures

In addition to FPC's supply- and demand-side resources, there are additional operational measures that can be called upon to assist in emergency conditions. FPC abides by the requirements for adequacy and reserve sharing outlined in Rule 25-6.035, which enables FPC to request support from neighboring utilities if that becomes necessary. FPC also provides support to other utilities on a reciprocal

basis. Public appeals for conservation may also be used if the conditions are extreme.

In summary, FPC's plans provide for adequate, reliable, and economic energy to meet the needs of its customers. Through proper planning, participation in the FRCC, and adherence to Rule 25-6.035, FPC is able to serve its customers adequately and support other utilities in the State that may require assistance. The coordination and reserve sharing arrangements in Peninsular Florida help ensure an adequate and reliable source of energy throughout Peninsular Florida.

Issue 13

Q. How do the reliability criteria adopted by the FRCC compare to the reliability criteria adopted by other reliability councils?

A. The FRCC's research on reliability criteria in other reliability regions indicates that its 15% reserve margin standard is reasonably consistent with criteria being used in other areas of the country.

Issue 14

Q. Should the Commission adopt a reserve margin standard for individual utilities in Florida? If so, what should be the appropriate reserve margin criteria for individual utilities in Florida?

A. No. In the Staff Workshop Agenda for the workshop held on January 25, 1999, Staff stated, "Staff is not seeking to establish individual reserve levels for each electric utility, but rather seeks to pursue the issue from an aggregated Peninsular Florida perspective." We agree with this approach. The FPSC adopted Rule 25-6.035 to address any concerns about the equitable sharing of reserves among Peninsular Florida's utilities, and no additional criteria or standards are needed. Each utility has a unique set of circumstances for which it needs to establish long-term planning approaches. The relationships and expectations of utility customers vary from system to system, both in terms of reliability and price. It would be overly prescriptive to mandate a specific criteria approach for all utilities, regardless of the unique circumstances for which they must plan. Each utility should establish its own planning methodology.

Q. If the FPSC were to establish some form of new standard, should there be a transition period for utilities to meet that standard?

A. Yes. If the FPSC chooses to establish any new reliability standards, there should be an appropriate transition period for utilities that are not in compliance with the proposed new standard. This transition period would be required to enable utilities to make any necessary arrangements to adjust their resources and/or communicate the impetus and potential impacts to their customers and shareholders.

Issue 15

Q. Should the Commission adopt a reserve margin standard for Peninsular Florida? If so, what should be the appropriate reserve margin criteria for Peninsular Florida?

A. No, the Commission should not adopt a reserve margin standard for Peninsular Florida. The FPSC may obtain necessary assurances about the adequacy of power resources in Peninsular Florida through its active support of and participation in the FRCC's annual adequacy planning activities. Participation by Commission

Staff in the FRCC planning process has been valuable to both the FRCC and the Staff in better fulfilling the needs of both institutions.

Issue 16

Q. Should the Commission adopt a maximum reserve margin criteria?

A. No. A maximum reserve margin limit should not be necessary. Within the current regulatory framework, the utilities in the State are already required to demonstrate the need for significant generation additions. This regulatory process imposes limits as a result of the economic and environmental considerations that must be addressed.

Q. Should the Commission adopt any other reliability criteria for planning purposes; *e.g.*, the level of reserves necessary to avoid interrupting firm load during extreme weather?

A. No. Maintaining the level of generating reserves required to ensure that firm load is always served, even in extreme weather conditions, has never been deemed practical or in the best interests of the utility customers in the State.

Issue 17

Q. What percent reserve margin is currently planned for Peninsular Florida, and is it sufficient to provide an adequate and reliable source of energy for operational and emergency purposes in Peninsular Florida?

A. The FRCC reserve margin standard establishes a minimum threshold of 15% for Peninsular Florida. The reliability studies conducted by the FRCC indicate that the reserve margin levels will be above the minimum threshold for the planning horizon and will be sufficient to provide adequate and reliable energy supplies for Peninsular Florida. FPC supports the FRCC studies and endorses the conclusions in them.

Issue 18

Q. How do out-of-Peninsular Florida power sales impact the availability of Peninsular Florida reserve capacity to serve Peninsular Florida consumers during a capacity shortage?

A. **Long-Term Power Sales**

Traditionally, long-term power sales (more than 1 year) or long-term forwards (arranged more than 1 year in advance) are included in the planning load requirements of the utilities selling the power. As a result, the reported reserve levels for the selling utilities are lower, reflecting the additional sales requirements. This would apply to all sales, whether in-state or out-of-state. Each utility must examine the required balance of reliability and lowest cost supply to its customers as it develops resource plans to meet its individual planning criteria, including the sales. Once each utility determines its balance of sales and resources, the results are then aggregated at a state level and adjustments are made in reported reserve capacity to accommodate the out-of-state sales. Given that the planning process at the utility level and Peninsular Florida level address these sales requirements, the issue for long-term sales is rendered moot.

Short-Term Power Sales

From a short-term operating perspective, utilities have the opportunity to examine the state of their systems (expected loads, generator availability) before making arrangements to sell power, either in-state or out-of-state. Utility operations teams are obligated to maximize the utilization of their assets to minimize total

cost to consumers and to maximize the value of the utility's assets for its shareholders. They must make judgments regarding the availability of resources and the most appropriate balance of economics and reliability in determining whether or not to sell power off-system. Utilities must also examine the risk of dropping below the shared operating reserve margin requirements set out in Rule 25-6.035. Because of the dynamic and changing nature of each of these components, individual utility determinations concerning short-term sales will best serve to create the necessary balance between economic off-system sales and the available operating reserves.

Q. How does this issue relate to the rights of customers supporting utility rate base?

A. Utilities are charged with making reasonable efforts to ensure the lowest cost supply of energy to their customers. To this end, utilities attempt to work within the realm of the Energy Broker Network and the wholesale market to find opportunities to market surplus power that can provide a margin contribution to lowering cost. This is an important component of shared benefits that all of the customers in the State appreciate.

Q. Do Florida customers rely on sources of power from outside of the Peninsular Florida planning region?

A. Florida utilities purchase over 5% of the State's firm generating capacity and energy from generating resources outside of Peninsular Florida (ref: FRCC 1999 Load and Resource Plan). These resources are a vital link to economic sources of energy for Florida utilities and are dedicated to the needs of Florida consumers through the various utility contract and ownership arrangements.

Issue 19

Q. Based on the resolution of Issues 1 through 18, what follow-up action, if any, should the Commission pursue?

A. The FPSC should continue to monitor reserve margins in Florida through the 10 Year Site Plan review process.

Q. Does that conclude your testimony?

A. Yes.

Interrogatory # 11 Region Name >	MAAC Mid-Atlantic Area Council	ECAR East Central Area Reliability Coordination Agreement	MAIN Mid-America Interconnected Network, Inc	MAPP Mid-Continent Area Power Pool	SPP Southwest Power Pool	SERC Southeastern Electric Reliability Council	NPCC Northeast Power Coordinating Council	FRCC Florida Reliability Coordinating Council	ERCOT Electric Reliability Council of Texas	WSCC Western Systems Coordinating Council
Reliability Indices	Loss of Load Expectation, LOLE 1 day in 10 years	Dependence on Supplemental Capacity Resources, DSCR which is a maximum of 10 days per year	17% - 20% based on Loss of Load Expectation, LOLE of 1 day in 10 years	require a Reserve Capacity Obligation (RCO) of 15%	Capacity Margin Requirement of 12%	No required reserve margin, however have used 15% capacity margin as a target	Each control area is required to plan their system such that firm load interruptions will not be more that once in 10 years	15% Reserve Margin	15% Reserve Margin	not provided
Size of region	49,807 MW (1999 forecast)	93,991 MW (1999 forecast)	47,874 MW (1999 forecast)	35,996 MW 1998 Summer Non-coincident Peak Demand	36,025 MW Summer Net Internal Demand (1999 forecast)	132,507 MW Summer Net Internal Demand (1999 forecast)	91,734 MW Summer Net Internal Demand (1999 forecast)	36,786 MW (1999 forecast)	50,479 Summer Net Internal Demand (1999 forecast)	127,639 MW Summer Net Internal Demand (1999 forecast)
Number of generating units	517	839	800	158 units > 70 MW 837units < 70 MW	not provided	not provided	not provided	344 Utility 81 Non-Utility	390	not provided
Import capability	3500MW Capacity Benefit Margin is used in the evaluation of installed capacity requirement	Roughly 9,000 MW of total transfer capability into ECAR. Additional information is available on their website, www.ecar.org	6600 MW (FCITC) (from the 1999 MAIN Summer Transmission Assessment Study)	2700 MW summer 3800 MW winter (both are FCITC)	1,669 MW (From NERC 1999 Summer Assessment)	18,000 MW (From NERC 1999 Summer Assessment)	5,200 MW (From NERC 1999 Summer Assessment)	3,600 MW	940 MW	1,080 MW (From NERC 1999 Summer Assessment)
Number of Interconnects	MAAC is interconnected to ECAR, SERC and NPCC via multiple transmission paths. Specific company interconnections include Cleveland Electric Illuminating, Allegheny Power, Virginia Power and New York Power Pool	~93 interconnections	107	68	not provided	not provided	not provided	10	2	not provided
Quantity of non-firm load	2181 MW	3316 MW (1999 forecast)	2305 MW (1999 forecast)	2256 MW	not provided	not provided	not provided	2,765 MW 1999 summer 4,012 MW 1999/00 winter	3,185 MW	not provided
Non-committed capacity	~2000 MW above participant obligations	8,200 MW of reported "planned capacity", does not include capacity that is being permitted or is under construction	none	6319 MW 1999 summer 6117 MW 1998 winter (both values are above the 15% Reliability Capacity Obligation)	not provided	not provided	not provided	7,393 MW summer 8,261 MW winter (Based on "planned" additions as listed in the 1999 FRCC Load & Resource Plan)	not provided	not provided
Equivalent Availability Factors	Individual unit factors are confidential. The five year forced outage rate for all PJM installed capacity is 9.52%	Individual unit factors are confidential. The Random Outage Factor for the period 1993-1997 is 9.7 % (ECAR average)	see NERC GADS data	MAPP does not collect this data see NERC GADS data	not provided	not provided	not provided	EAF of 89.9 (from NERC GADS data - 1998)	not provided	not provided

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