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August 13, 1999

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Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
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Re: Generic investigation into the aggregate electric utility reserve margins planned for Peninsular Florida - Docket #981890-EU

Dear Ms. Bayo:

Enclosed find an original and 15 copies of the testimony of Paul H. Elwing, of the City of Lakeland, together with a Certificate of Service, to be filed in the above-captioned docket. We are also enclosing a diskette.

Very truly yours,

Roy C. Young/swp

Roy C. Young

RCY:swp
Enclosures

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FPSC-RECORDS/REPORTING

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

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that the a copy of the Testimony of Paul H. Elwing, City of Lakeland, to the Issues raised in this matter have been furnished via U.S. Mail this 13th day of August, 1999, to the following:

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ORIGINAL

BEFORE THE PUBLIC SERVICE COMMISSION

CITY OF LAKELAND

TESTIMONY OF PAUL H. ELWING

DOCKET NO. 981890-EU

AUGUST 9, 1999

Q. Please state your name, address, occupation and employer.

A. My name is Paul H. Elwing. My business address is 501 E. Lemon St., Lakeland Florida 33810. I am employed by the City of Lakeland, Electric Department, referred to as Lakeland Electric.

Q. Please provide a brief outline of your educational background and business experience.

A. I have a Bachelor of Science degree in Electrical Engineering from the University of South Florida. I have been employed by Lakeland Electric for 19 years, of which 16 years were spent in the System Planning Division during which I held the position of Manager of System Planning for 9 years. My most recent 3 years with Lakeland Electric have been spent in the operations side of Lakeland Electric doing short term operational planning and analysis.

Q. What is the purpose of your testimony in this proceeding?

A. The primary purpose of my testimony is to address issues identified in Docket No. 981890-EU, Generic Investigation Into the Aggregate Electric Utility Reserve Margins Planned for Peninsular Florida, by presenting Lakeland Electric's views and methodologies regarding generation reliability and adequacy as it relates to this Docket.

Q. What is the appropriate methodology, for planning purposes, for calculating reserve margins for individual utilities and for Peninsular Florida ?

A. Reserve margin is traditionally defined as the total installed generating capacity minus the forecasted annual peak load divided by the forecasted annual peak load and is expressed in percent. Mathematically this would be :

((Capacity – Load) / Load) X 100

From a methodology standpoint, reserve margins for individual utilities and for Peninsular Florida should be calculated using the above equation. Capacity should be based on the net dependable generating capability of the system in question for time period being evaluated and the load should likewise be the net load the utility(ies) or region intends to serve at time of peak for the time period being evaluated. Lakeland uses percent reserve margin criteria and performs reserve margin calculations based on summer and winter peak demand for planning purposes.

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

A. An evaluation of individual utilities must be done on an individual utility basis. The evaluation must also be unique to each utility as no two utilities reliability needs are exactly the same. A one size fits all methodology, criteria, analysis or evaluation is not appropriate for all utilities as each utility is unique and has different needs and concerns regarding serving load in reliable manner. If reserve margin is the criteria being used, it must be determined what the reserve margin is being used for, ie; is it covering only forecast uncertainty, loss of unit, combination of both, or other concerns? From that identification of use, it can then be determined as to whether the specified reserve margin is adequate to meet the needs of the utility to reliably serve its customers.

Q. What are the individual components of an individual utilities percent reserve margin planning criterion and how should they be defined?

A. The individual components of percent reserve margin plannig criteria are made up of capacity available at time of the peak being analyzed and the peak load to be served at that same time of peak. Lakeland Electric defines the capacity available at time of peak as the net generation available to serve load at time of peak, plus purchases and minus sales. Lakeland defines peak load as the net load to be served at that time of peak after taking into account the effects of any Interruptible, Curtailable and DSM load. Another way of defining peak load is total load minus interruptible load minus curtailable load minus DSM load.

On an individual utility basis, any supply side resource available at time of peak that is either owned by the utility or that is contracted for by the utility should be included in that utilities reserve margin calculation. The firmness of a resource whether an owned unit or a purchase should be left to the decision of the utility as to what level of risk is acceptable. Market pressures will be a sufficient deterrent to utilities over reliance on non-firm or unreliable resources.

Q. Over what period of time should the seasonal firm peak demand be determined?

A. Seasonal firm peak demand used in reliability calculations should be the net hourly integrated firm native load over the peak hour of the season in question. This has been the traditional value used and should continue to be used for this purpose as this represents the total sustained peak load that must be met by the utility.

Q. What is the purpose of having a percent reserve margin and what does it represent in individual utility planning?

A. One of the purposes for having reserves is to account for diversity of seasonal firm peak demand and load uncertainty, sometimes referred to as forecast error. In using reserve margin as a reliability criteria, reserve margin is a deterministic measure. Reserve margin normally assumes that all generation

will be available at time of peak leaving only forecast error as the variable quantity. Lakeland evaluates load uncertainty via a banded forecast and plans adequate reserve margin to ensure that if the high band happens, loads higher than expected, there is still sufficient supply side resources available to serve the load.

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

A. Loads that are under contract, whether they are interruptible, curtailable or load management, remain in Lakeland's forecast beyond the end of the contract period. Lakeland assumes those loads will continue to be served by Lakeland as they are integral to Lakeland's service territory. Wholesale loads that are contracted for that are outside of Lakeland's defined service territory are treated as a reduction in net generation resources available to Lakeland load and are included only for the years that the load is under contract for. Beyond the contract period Lakeland assumes that the control area that owns or hosts that load will be the provider beyond the end of the contract.

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

A. Lakeland handles demand and/or energy use reduction options in its load forecasting process. The resulting loads coming out of the forecast process have been adjusted for the effects of interruptible, curtailable and DSM loads

to yield a net firm load to be served. This net firm load to be served is then what is used in the reserve margin calculation.

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

A. Generating units should be rated at net dependable continuous seasonal capacity for inclusion in any generation reliability criterion calculation.

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 on the ratio of non-firm load to MW reserves so long as the utility has demonstrable proof that the non-firm load exists and can be controlled to meet their reserve requirements.

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

A. No. The individual utility should have the flexibility to secure reserves by whatever they feel is the most cost effective means available to them. Reserves should be demonstrable and available when called on.

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

A. Each utility should have the ability to select the planning criteria that it feels best meets the need of its system. Electric systems are dynamic in nature and as a result, utilities must have the flexibility to change their criteria from time to time and / or use multiple criteria to assess generation adequacy.

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

A. Lakeland does not rely on import capability for its reserve margin and reliability criteria. Lakeland does believe that import capability should be accounted for in an individual utilities reliability criteria if that utility uses that capability and depends on it to serve firm load.

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

A. Lakeland appropriately accounts for historical winter and summer temperatures when forecasting seasonal peak loads for purposes of establishing a percent reserve margin planning criterion. As has been previously supplied to Commission Staff, Lakeland bases its temperature at

time of seasonal peak based on historical temperature at peak. Lakeland uses approximately 30 years of temperature data to determine forecasted temperature at time of peak. This has been proven an acceptable methodology by applying all time high and low temperatures to Lakeland's forecast model to develop extreme loads due to weather conditions to determine if the planned reserve margin is large enough to accommodate the load that would accompany the extreme temperatures. To date all analysis has shown that Lakeland's planned reserve margin is adequate to cover both normal and extreme temperature conditions such as temperatures experienced during the 1989 freeze.

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

A. Lakeland currently uses a 15% reserve margin for planning purposes. Lakeland feels this is adequate for its system at this time. Lakeland has tested its 15% reserve margin by applying extreme temperatures to its forecast model to determine an extreme MW peak. That extreme MW peak has still been less than total planned capacity which includes the 15% reserve margin. Lakeland feels this adequately shows that the 15% reserve margin used covers forecast uncertainties due to extreme weather conditions at this point in time.

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? Should there be a transition period for utilities to meet that standard?

A. No. The Commission should not adopt a reliability standard for individual utilities. Each utility is different in its size and makeup of generating resources. The electrical systems of each utility are dynamic in nature and change over time as load changes and resources change. A single reliability standard cannot and will not address the needs of all utilities. Not all utilities find that reserve margin in and of itself is the appropriate reliability criteria for their system. Certainly reserves are an important and necessary part of the reliable operation of the electric utilities in Florida, however, the utilities themselves should be the entities that determine what that level should be. The Commission should be in a role of review to see that the criteria being used by the individual utility, provides for the uncertainties and needs for that particular utility.

Q. Should a utility be allowed to upgrade or change their planning criteria if such changes can be demonstrated to maintain or improve the reliability of the utility system?

A. Yes. Electric systems are dynamic as they must respond to changing conditions which affect load. Utilities must be free to choose reliability criteria that meet the needs of the system as the system changes over time. Even

within a single reliability criteria, there must be flexibility. As an example, two utilities with exactly the same load and exactly the same amount of generation can have totally different reliability needs. If utility "A's" capacity is made up of ten units and "B's" capacity is made up in only two large units, "B's" reliability needs to cover the loss of a unit is completely different than for "A". Likewise, if "A" has very little tieline capacity but "B" has sufficient tieline capacity to import its total load, "B" could have a much less reliability margin need than "A". As each system is different, so should the reliability criteria be different to meet the individual need. One size does not fit all. Utilities must have the flexibility to both choose the appropriate criteria for their respective systems and have the flexibility to change or adjust that criteria as the system changes.

This very type of change is what has prompted the Commission and its Staff to question the LOLP results from the FRCC analysis of Peninsular Florida. As Florida has grown over the past years and technology has changed, the mix of units in Florida has changed and is forecast to change even more in the future. The current forecasts of units to be added show smaller units with higher reliability than in the past. Most utilities are indicating plans to add combined cycle units which come in block sizes of approximately 250MW with very high reliability. In the past, what was forecasted to be added were large 600MW coal units with lower overall reliability. From a probability standpoint, five 250MW units are worth much more than two 600MW units even if they have the exact same forced outage rate. The loss of one large 600MW unit has a much greater impact than the loss of one 250MW unit. As

unit sizes change over time, the equivalent reserve margin will change for a given probabilistic reliability criteria. This means that the 0.1 Loss of Load Probability (LOLP) that Florida as an aggregate had used for a number of years equates to a smaller reserve margin because there are both more units and smaller units. Does that mean that probabilistic measures should be abandoned because they indicate smaller reserve margin needs? No. Does that mean that reserve margins should be set to one number for all and for all time? No. Each utility has different needs. Some utilities need to cover loss of the largest unit, to some forecast uncertainty is more critical and others may be combinations of both, plus other concerns. Utilities must have the flexibility to plan their systems to meet the unique needs of their systems and not be forced into a one size fits all criteria.