BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for rate increase by Progress Energy Florida, Inc.

Docket No. 050078-EI

Submitted for filing: August 5, 2005

REBUTTAL TESTIMONY OF
STEVEN P. HARRIS

ON BEHALF OF PROGRESS ENERGY FLORIDA

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REBUTTAL TESTIMONY OF STEVEN P. HARRIS

ON BEHALF OF PROGRESS ENERGY FLORIDA, INC.

I. Introduction.

Q. Please state your name and business address.

A. My name is Steven P. Harris. My business address is ABSG Consulting, Inc. ("ABS Consulting"), 1111 Broadway Street, Oakland, California 94607.

Q. What is the purpose of your rebuttal testimony?

A. I will respond to portions of the testimony submitted on behalf of Office of the Public Counsel by Helmuth W. Schultz, III; The Florida Retail Federation by Sheree L. Brown; and AARP by Stephen A. Stewart, addressing the estimated annual storm loss on Progress Energy Florida's ("PEF") system and those witnesses' respective calculations of a proposed annual Storm Damage Accrual amount.

Q. Are you sponsoring any exhibits to your rebuttal testimony?

A. Yes. I am sponsoring the exhibits that follow:

- Exhibit _____(SPH-1), Numbers of Historical Hurricanes Affecting Current PEF Service Territory by Decade and by Maximum SSI Wind Speed in PEF Service Territory;
- Exhibit _____(SPH-2a), Landfall Milepost Map;

- Exhibit _____(SPH-2b), Comparison of Protection Afforded by $50m and $15m Annual Accrual Against Potential T&D Storms Damage From a Single SSI 1 Landfall at Milepost;
- Exhibit _____(SPH-2c), Comparison of Protection Afforded by $50m and $15m Annual Accrual Against Potential T&D Storms Damage From a Single SSI 3 Landfall at Milepost;
- Exhibit _____(SPH-2d), Comparison of Protection Afforded by $50m and $15m Annual Accrual Against Potential T&D Storms Damage From a Single SSI 4 Landfall at Milepost;
- Exhibit _____ (SPH-3), Storm Reserve Fund Analysis Case Results-Two Year Recovery of Negative Balances;
- Exhibit _____(SPH-4), PEF Transmission and Distribution Asset Hurricane Loss Reserve Solvency Analyses, August, 2005.

These exhibits are true and accurate.

Q. Can you summarize Mr. Schultz's, Ms. Brown's, and Mr. Stewart's basic positions on PEF's proposed annual storm damage accrual amount?

A. Yes, Mr. Schultz, Ms. Brown, and Mr. Stewart all contend that PEF has overstated its requested annual storm cost accrual. These intervenor witnesses assume that ten to fifteen years of recent favorable hurricane loss history can and will be adequate to protect hurricane losses into the future. They also assume that expected annual damage ("EAD"), can be reliably calculated based on limited hurricane damage data, excluding SSI 3, 4 and 5 events, and they contend that

such data is adequate to define what PEF's reserve accrual should be. Finally, these intervenor witnesses propose an annual accrual amount that does not consider the fund starting balance, target balance, or solvency criteria. Based on these principles, these witnesses propose that PEF's annual storm cost accrual should be $12.5 million, $15.2 million, and $10 million, respectively.

Q. Do you agree with these witnesses' positions and analyses?

A. No, I do not. Estimation of the loss potential due to hurricanes requires the estimation of all possible hurricane events and the estimation of the damage done to assets at risk. This process establishes the magnitude of damage and the probability of its occurrence. In addition, estimates can and should be made of the expected annual damage. This analytic process is termed "loss analysis." Calculating an actual or simulated expected annual storm damage amount that selectively excludes any possible damage events, whether large and infrequent or small and frequent, is neither meaningful nor appropriate. Any reliable estimate of the expected annual damage (EAD) to which PEF is exposed from hurricanes must include the most complete and full damage distribution that can be determined both from actual experience and from simulated possible damage.

Hurricane events and damage occur in somewhat random processes, subject to chance. Over any given time sample, some years may experience no damage and others greater damage. Therefore, in developing expected annual damage estimates, the most reliable methodology is to utilize the longest, most complete historical record available. Since Florida's recorded hurricane history is

just over 100 years old, insurers rely on simulation modeling to extend this "known" history into thousands of simulated years for the purpose of estimating likely damage. The simulated expected annual damage to PEF's system is the best estimate of the annual damage considering all possible future hurricanes; not just arbitrarily defined "normal" damage events as proposed by Mr. Stewart and implied by Mr. Schultz and Ms. Brown when they eliminate damage from 2004 as "extraordinary."

Q. Does the model that you used in your analysis of PEF's potential hurricane risk exposure utilize all the factors that you just discussed?

A. Yes. The Florida Commission on Hurricane Loss Projection Methodology (FCHLPM), an independent panel of experts that evaluates computer models and actuarial methodologies for projecting hurricane losses, goes to great lengths to ensure that all models used in the State for insurance rating purposes appropriately capture the full range of the hurricane hazard. The ABS Consulting USWIND™ model used to calculate PEF's expected annual damage is one of only four models evaluated and determined acceptable by the FCHLPM for projecting hurricane loss costs.

Q. How do you respond to intervenor arguments that PEF's hurricane damage experience over the past 10 years has been relatively minimal?

A. The intervenor witnesses argue that the average annual hurricane damage to PEF'S T&D assets over the past ten years is about $2 million when the damage

from the hurricanes of 2004 is excluded. They contend that the hurricanes exclusive of the 2004 season are "normal" hurricanes and that all other events beyond $2 million per year in damage are extraordinary. What these witnesses fail to recognize, however, is that PEF has experienced a favorable decade (1990 to 1999) of hurricane storm history, consisting of a few small storms and small losses. There were no hurricanes with strong SSI 2 to SSI 4 winds that made landfalls near PEF's service territory during this period. Exhibit ___ (SPH-1) shows the number of historical hurricanes that have affected PEF's service territory over a 100-year history. Hurricanes with wind speeds defined by SSI intensities 1 through 3 are shown. On average, three and a third hurricanes per decade have affected PEF territory with sustained wind speeds in excess of 74 mph. The decades of the 1920s, 1940s and 1960s experienced an above average number of events. The decades of the 1970s, 1980s and 1990s experienced below average numbers of events. The 1990s have had the lowest number of hurricane force storms in PEF territory since the decade of the 1900s. The decade of the 2000s is only half through and there have been more than the 100-year average numbers of events with hurricane force winds. Therefore, characterization of PEF's hurricane experience over the 1990s, which was below average in number, consisting of one SSI-1 event, as "normal" is inaccurate and misleading.

Q. What is your assessment of the intervenor witnesses' positions on PEF's hurricane exposure risk?

A. The intervenor recommendations that $2 million should be considered a representative sample of the expected annual damage to PEF assets would only be acceptable if PEF's management and the Commission are willing to speculate that PEF's recent good luck over a brief, selective storm period considered by Mr. Schultz and other witnesses will continue. However, over the 100-year history, hurricane landfalls and damaging events have occurred much more often than in the last 10 years. Also, there is a growing body of evidence suggesting that the North Atlantic Oscillation (NAO) and the El Niño or Southern Oscillation (ENSO) are important climate variables in modulating hurricane return periods. The damage estimated in the ABS Consulting Rapid Update Study assumes the average hurricane activity over the century. If you accept the opinion that changes in the ENSO and NAO variables indicate we have entered a more active period for hurricane formation like the 1920s and 1940s, PEF may expect to experience higher than average damage to T&D and other assets over the next several years and the ABS Consulting damage estimates could understate the actual risk going forward.

Q. Is there any risk to PEF if the Commission adopts one of the three different intervenor recommendations on the amount of PEF's annual accrual for the storm reserve?

A. Yes. The annual accrual levels suggested by the intervenors present a much greater likelihood of reserve dissolvency over the five-year period of accrual that they recommend. This is so because the intervenor witnesses have not considered

the performance of the storm reserve at their respective recommended annual accrual levels.

Once an appropriate estimate of the potential for hurricane damage is established, a cash flow analysis is required to determine an appropriate level of funding and acceptable performance of the Storm Reserve to meet acceptable levels of protection against some, but not all, storms along with an acceptable likelihood of solvency of the Reserve. A solvency analysis provides a tool for management and policymakers to determine the performance of the Storm Reserve and to test whether annual accrual amounts meet their objectives. The performance and solvency over time of the Storm Reserve must consider an annual accrual along with a starting balance and a working target balance within some time frame. With rate stability as a policy objective, the question is what Storm Reserve balance should PEF seek to achieve and how quickly should it be reached to provide the desired stability in rates? Once a proper Storm Reserve balance is determined and achieved, an accrual that equals the expected annual damage will maintain this level in the Storm Reserve.

The ABS Consulting Solvency Analysis is a cash balance analysis starting with some initial balance, which is zero in this case. An annual accrual is added to the cash balance, and annual storm damage is simulated consistent with the Storm Loss Analysis for each of the five years. The storms are randomly simulated, but over a long period of time, they match the expected annual damage to PEF's system from the Loss Analysis for each of the five years in the solvency simulations.

For example, given that the expected annual damage is $15.1 million per year, if the Storm Reserve is funded at $15.1 million per year over a long period of time, the expected annual damage equals the annual accrual and the Reserve will not gain or lose value. At a balance of $0, any storm damage will have the effect of causing insolvency whenever it occurs. Therefore, with a starting balance of zero, the expected balance of the Reserve would always hover around zero without recovery of any negative Reserve balances. Likewise, if the beginning Storm Reserve balance is $150 million or $250 million, the balance will not grow if the annual accrual equals the expected annual damage. Rather, it will fluctuate around the beginning balance.

The future performance of the Storm Reserve cannot be established without a financial simulation analysis that includes both the annual accrual and the beginning balance of the Storm Reserve. The intervenors do not consider the starting Storm Reserve balance in making their recommendations. Only Mr. Schultz proposes a target Storm Reserve balance of $50 million within 5 years. However, Mr. Schultz and Ms. Brown both assume that annual damage will remain at around the historically low range of $2 million per year for the next five years allowing the fund to grow to $50 million at the end of 5 years.

By way of example, ABS Consulting has analyzed the performance of the Storm Reserve assuming the accruals recommended by Ms. Brown. Exhibit ___ (SPH-3), titled Storm Reserve Fund Analysis Case Results, demonstrates that the $15 million annual accrual recommended by Ms. Brown results in a 54% chance of insolvency within the five-year period with a recovery of negative balances over a

two-year period. $15 million is the largest of the three annual accruals proposed by intervenors ($10 m, 12.5m and 15.2m). A $15million accrual results in an expected $25 million Storm Reserve balance at the end of five years. There is a 54% chance of insolvency within the 5 year simulation and a 20% chance of fund insolvency at the end of 5 years.

The $10 and $12.5 million annual accruals recommended by Mr. Stewart and Mr. Schultz would result in a greater chance of insolvency and smaller expected balances. These accruals are contrasted with PEF's recommended annual accrual of $50 million, that has a 12% chance of insolvency within five years. At the end of five years, the expected balance in the Reserve is $183 million with a two year recovery of negative balances and there is a 2% chance of fund insolvency at the end of 5 years.

Q. Have you done anything to compare the levels of insolvency protection afforded by varying the levels of potential storms?

A. ABS Consulting performed an analysis of a full suite of possible hurricanes that could make landfall and cause damage to PEF's T&D assets. Exhibit _____ (SPH-2b) shows the frequency-weighted average T&D damage from single SSI-1 storms, the least intense on the Saffir-Simpson Hurricane Scale, that could make landfall at specified mileposts along the Florida coast. Single SSI-1 landfalls on the Gulf coast near mileposts 1160 to 1210, have a mean (average) T&D damage of approximately $60 million. Single SSI-1 landfalls on the Atlantic coast near mileposts 1620 to 1640, have an average T&D damage of nearly $40 million.

For a $15 million annual accrual the expected Reserve balance of $25 million after five years determined from the Solvency Analysis is adequate to cover some, but not all of the SSI-1 T&D damage in PEF's service territory. Exhibit No. ____ (SPH-2b), also shows that $50 million annual accrual, which results in an expected Reserve balance of $183 at the end of 5 years, would provide adequate funds for all SSI-1 T&D storm damage. Exhibit No. ____ (SPH-2c) shows that the expected Storm Reserve balance at the end of five years for a $50 million accrual and expected Reserve balance of $183 million at the end of five years will be adequate for some but not all SSI-3 storms. It will cover all landfalls north of milepost 1160 and south of milepost 1220. The $50 million accrual would cover most SSI-3 landfalls except the greatest damage in the near mileposts 1160 to 1220 where it would cover about three quarters of the damage in excess of $200 million.

Similarly, for SSI-4 storms, the $183 million balance expected Storm Reserve balance covers a little less than half of a strike between mileposts 1160 to 1220, where damage averages in excess of $350 million; the highest asset concentrations in PEF's service area.

Even if the Storm Reserve, as assumed by Mr. Schultz, were to reach a $50 million balance as the result of five years of very favorable hurricane experience, $50 million can be seen in Exhibit No. ___ (SPH-2c) to provide only enough funds to cover SSI 3 hurricanes making landfall in the least concentrated, extreme northern and southern areas of PEF's service territory. The annual accrual levels recommended by witnesses Brown, Schultz, and Stewart do not

even cover "normal" levels of storm damage. In fact, the annual accrual levels proposed by these witnesses along with the current zero Storm Reserve balance results in small expected Storm Reserve balances that would not cover T&D damage over any sustained period of time from anything but the smallest SSI-1 storms.

Q. How do you respond to Mr. Stewart's contention that the balance in the storm reserve would have been $515 million after the 2004 hurricane season if the accrual had been $50 million beginning in 1990 with the recovery of negative balances within two years?

A. In 1990, PEF did not need a $50 million annual Storm Reserve accrual because the Storm Reserve balance was $2.9 million and growing due to a favorable storm experience during the 1970s, 1980s and 1990s. Exhibit No. ____ (SPH-1) shows the historical numbers of hurricane landfalls of intensities SSI 1 through 5 that would have affected PEF's current service territory over the 104 year Florida hurricane history by decades. This exhibit demonstrates that the historical experience is highly variable and that the decades of the 1970s through 1990s represent a favorable lower frequency of hurricanes compared to earlier periods such as the 1920s, 1940s and 1960s.

PEF had fewer customers and PEF's asset base at risk was also much smaller in 1990. In addition, PEF could insure transmission and distribution assets until 1993, when insurance became unavailable and therefore didn't need a large Storm Reserve balance.

Viewed retrospectively, over the period from 1990 through 2004, however, PEF did need a higher annual accrual. This is borne out by the estimate of the historical annual damage of $33 million performed by Ms. Brown using a limited 10 years of loss history. The estimate of the expected annual damage (EAD) of $15.1 million is more representative of the much longer 100 year history, reflecting both decades of more and less favorable hurricane experience. Mr. Stewart's analysis demonstrates retrospectively, (based on the limited experience over the period from 1990 to 2004) that an annual accrual of $30 million would have been adequate to maintain a solvent Storm Reserve.

Q. Do you have any concluding remarks regarding your testimony?

A. Yes. With a current zero Storm Reserve balance, PEF has requested a $50 million annual accrual, approximately $15 million for expected annual damage plus $35 million to build the Storm Reserve up to a working balance of $183 million that can fund for most non-catastrophic storms. The ABS Consulting's Solvency Analysis shows there is value in setting the annual accrual at a level higher than the expected annual damage. Assuming an annual accrual of $15 million and a two-year recovery of negative balances, close to the expected annual damage, 54% of the time PEF's Storm Reserve will go insolvent within 5 years. If the annual accrual is $50 million and recovery of negative balances occurs over a two-year period, the likelihood of insolvency within the 5 years goes down to 12%. Therefore, the value of accruing at a level higher than the expected annual damage until PEF's Storm Reserve reaches some substantial balance is a more

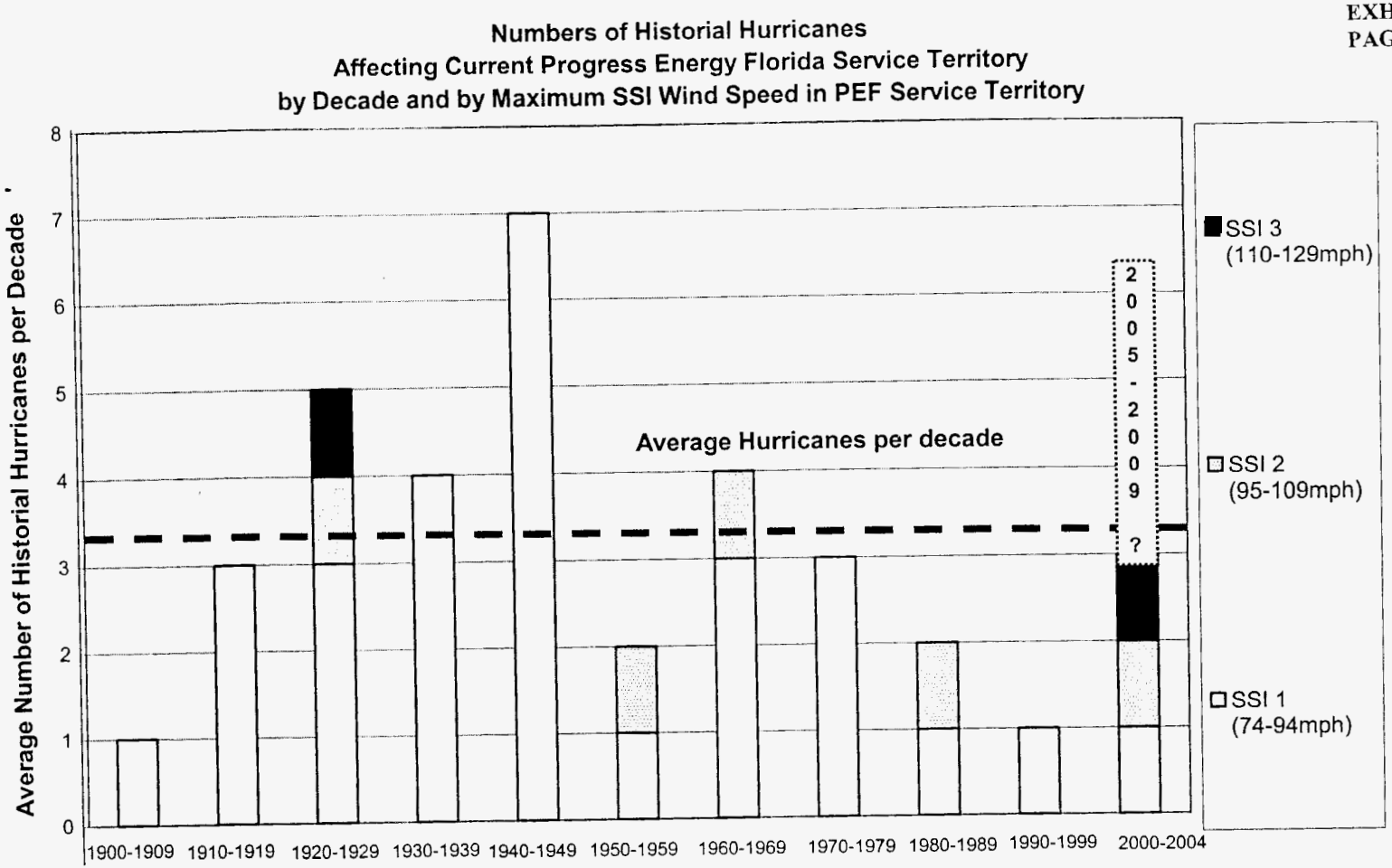
rapid growth of the Reserve balance, a reduction in volatility, and a reduction in the likelihood of insolvency of more than 75% over the period. This reduction in volatility would be seen in a reduced frequency of special assessments and a reduction of the levels of borrowing costs when the Storm Reserve does become insolvent from extraordinary storm years.

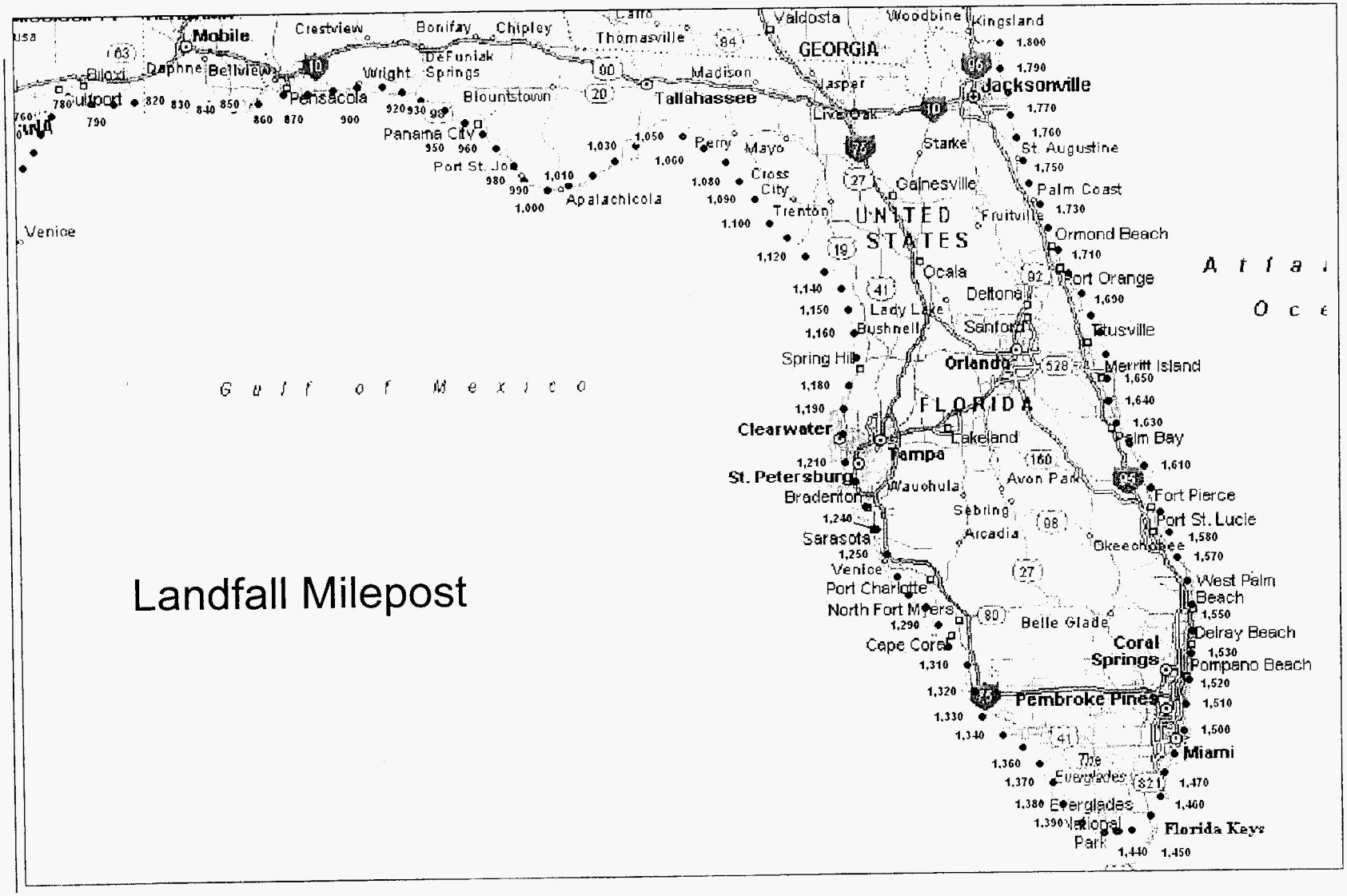
If the PEF Storm Reserve balance had been zero at the beginning of the 2004 storm season, the current deficit from storm restoration would be the full $350 million in uninsured damage. Providing a positive target balance for the Storm Reserve reduces the rate volatility and results in less frequent special assessments for cost recovery.

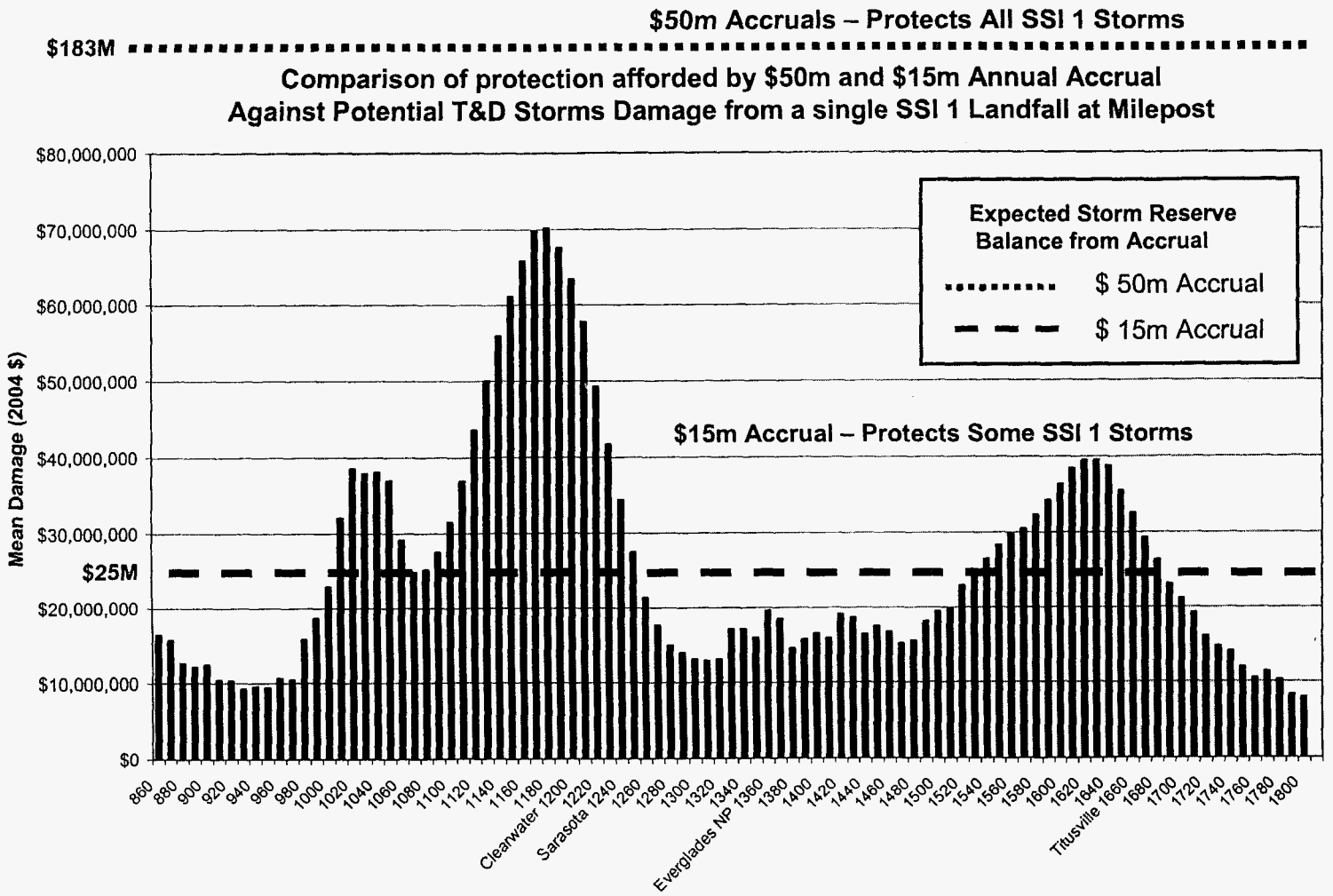
I also would like to mention that this month, we have just completed PEF's full Transmission and Distribution Hurricane Loss Reserve Solvency Analysis. A copy of that analysis is included with this testimony as Exhibit No. __(SPH-4). Based on this full study, PEF could support a request for a $75 million annual accrual to the Storm Damage Reserve. This fact shows that PEF's request for a $50 million accrual is clearly conservative and very reasonable.

Q. Does this conclude your testimony?

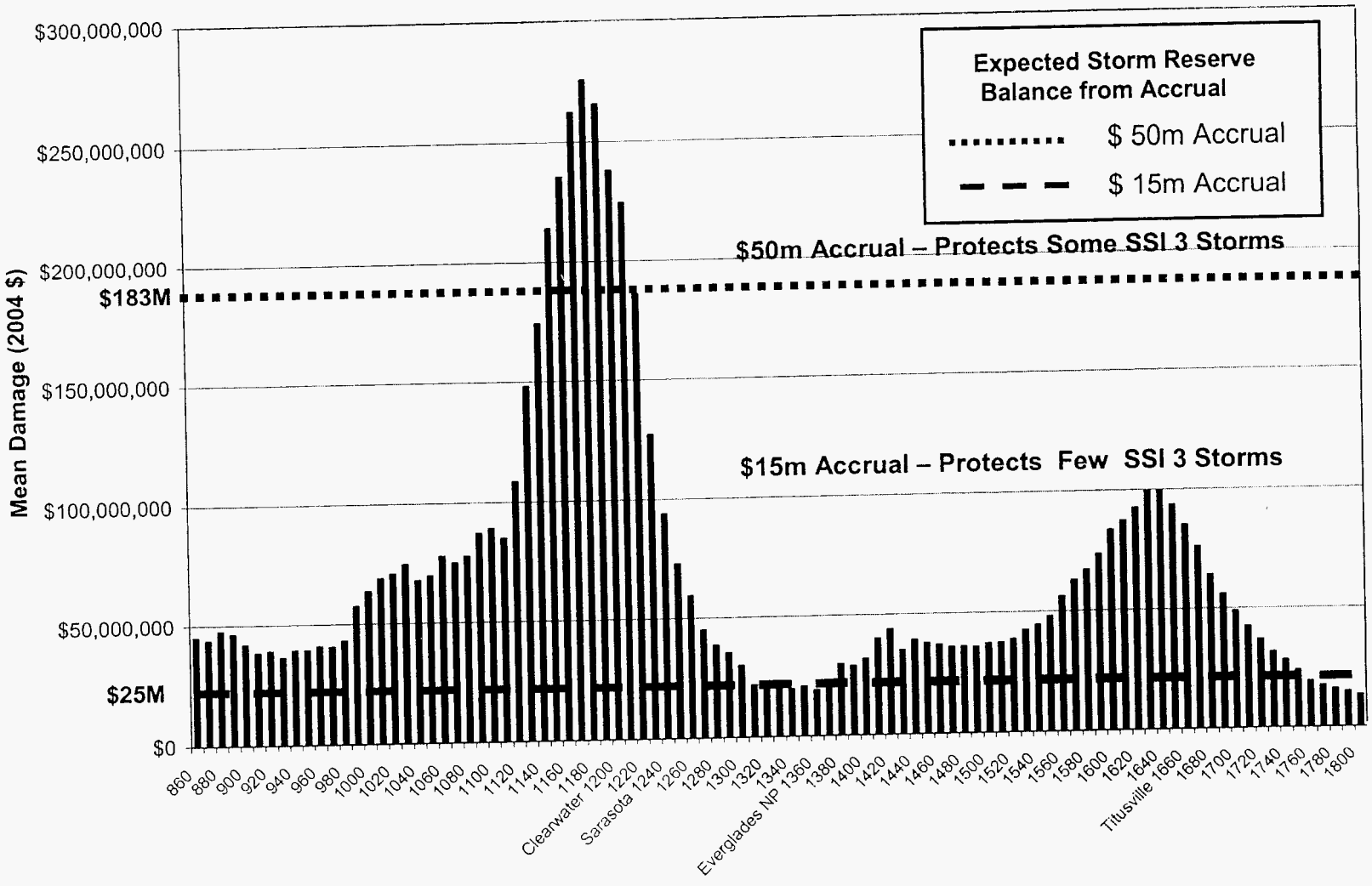
A. Yes.


Numbers of Historial Hurricanes
Affecting Current Progress Energy Florida Service Territory
by Decade and by Maximum SSI Wind Speed in PEF Service Territory
Average Number of Historial Hurricanes per Decade
0
1
2
3
4
5
6
7
8
Average Hurricanes per decade
2005-2009?
SSI 3 (110-129mph)
SSI 2 (95-109mph)
SSI 1 (74-94mph)
1900-1909
1910-1919
1920-1929
1930-1939
1940-1949
1950-1959
1960-1969
1970-1979
1980-1989
1990-1999
2000-2004

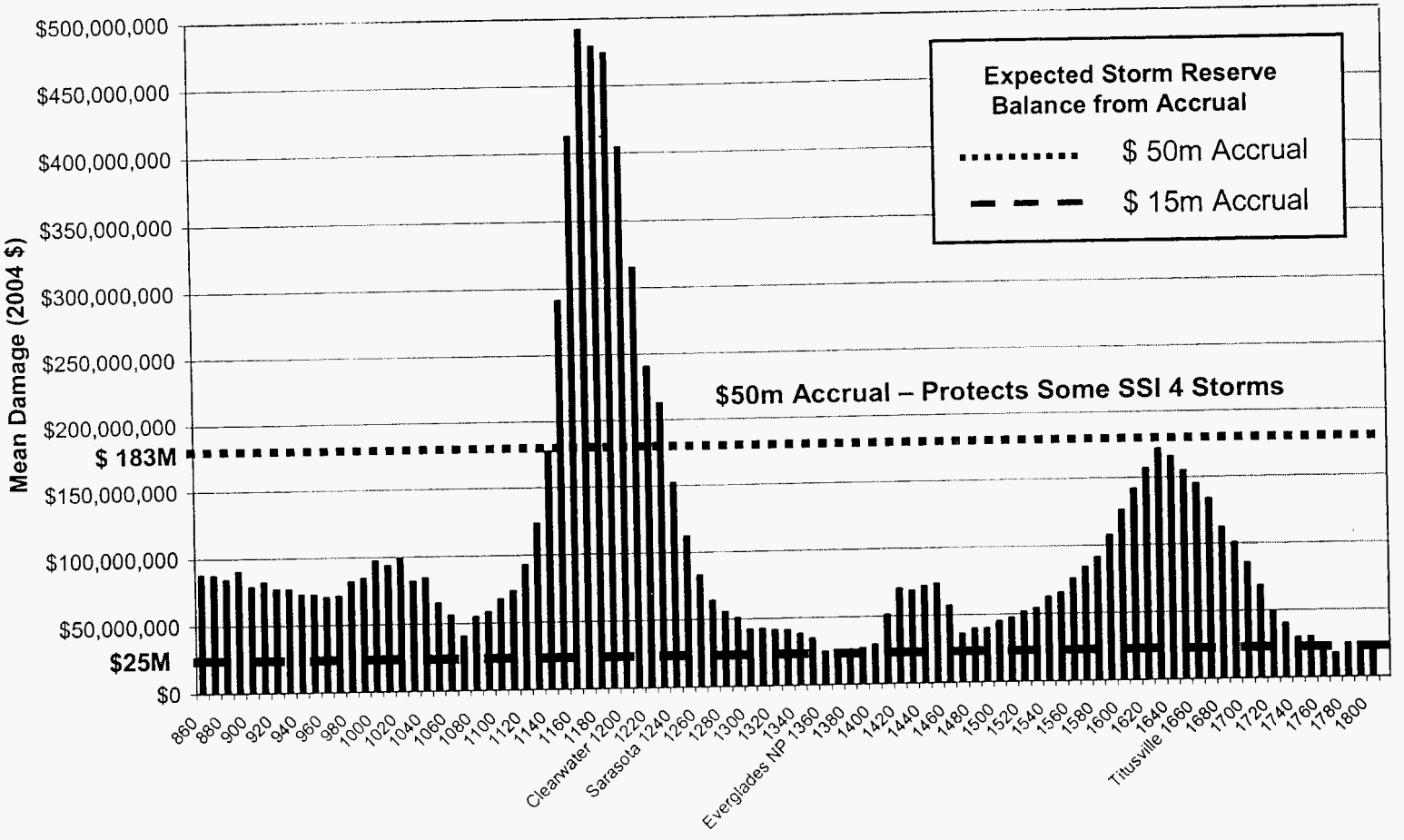

Landfall Milepost
Gulf of Mexico
Atlantic Ocean
UNITED STATES
GEORGIA
FLORIDA
Mobile
Crestview
Bonifay
Chipley
Thomasville
Valdosta
Woodbine
Kingsland
Jacksonville
Pensacola
Tallahassee
Panama City
Port St. Joe
Apalachicola
Perry
Mayo
Cross City
Trenton
Gainesville
Starke
Live Oak
Lake City
Fruitville
Ormond Beach
Palm Coast
St Augustine
Port Orange
Daytona
Deltona
Sanford
Orlando
Ocala
Spring Hill
Clearwater
St. Petersburg
Tampa
Lakeland
Bradenton
Sarasota
Venice
Port Charlotte
North Fort Myers
Cape Coral
Arcadia
Wauchula
Sebring
Avon Park
Lady Lake
Bushnell
Merritt Island
Palm Bay
Fort Pierce
Port St. Lucie
Okeechobee
West Palm Beach
Belle Glade
Delray Beach
Pompano Beach
Coral Springs
Pembroke Pines
Miami
The Everglades
Everglades National Park
Florida Keys


$50m Accruals – Protects All SSI 1 Storms
$183M
Comparison of protection afforded by $50m and $15m Annual Accrual
Against Potential T&D Storms Damage from a single SSI 1 Landfall at Milepost
Mean Damage (2004 $)
$80,000,000
$70,000,000
$60,000,000
$50,000,000
$40,000,000
$30,000,000
$25M
$20,000,000
$10,000,000
$0
Expected Storm Reserve Balance from Accrual
$ 50m Accrual
$ 15m Accrual
$15m Accrual – Protects Some SSI 1 Storms
860 880 900 920 940 960 980 1000 1020 1040 1060 1080 1100 1120 1140 1160 1180
Clearwater 1200
1220
Sarasota 1240
1260 1280 1300 1320 1340
Everglades NP 1360
1380 1400 1420 1440 1460 1480 1500 1520 1540 1560 1580 1600 1620 1640
Titusville 1660
1680 1700 1720 1740 1760 1780 1800

Comparison of protection afforded by $50m and $15m Annual Accrual Against Potential T&D Storm Damage from a Single SSI 3 Landfall at Milepost



Comparison of protection afforded by $50m and $15m Annual Accrual Against Potential T&D Storm Damage from a Single SSI 4 Landfall at Milepost



Storm Reserve Fund Analysis Case Results

Two Year Recovery of Negative Balances

Annual Accrual	*Mean (Expected) Fund Balance at 5 years ($ millions)*	*Probability of insolvency within 5 years*	*Probability of insolvency at the end of year 5*
$15 million	*$25*	*54%*	*20%*
$50 million	*$183*	*12%*	*2%*

Progress Energy

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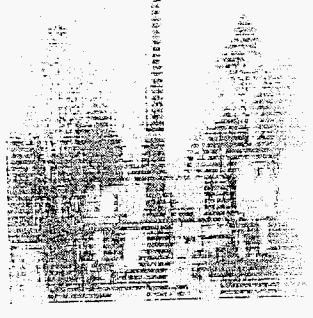
Transmission and Distribution Assets

Hurricane Loss and Reserve Solvency Analyses

August 2005



ABS Consulting

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Risk Profile

The following is a summary description of analyses performed by ABS Consulting for the Progress Energy Florida (PEF) Storm Loss and Storm Reserve Solvency, and is intended to be used solely by PEF and the Florida Public Service Commission for estimation of potential future PEF losses to the Storm Reserve and the estimation of the performance of the Storm Reserve Fund.

OWNER	**Progress Energy Florida**	
ASSETS	Transmission and Distribution (T & D) System consisting of: Transmission towers, and conductors; Distribution poles, transformers, conductors, lighting and other miscellaneous assets	
LOCATION	All T & D assets located within State of Florida	
ASSET VALUE	Normal replacement value is approximately $ 5.3 billion, of which approximately 34% is transmission and 66% is distribution	
LOSS PERIL	Hurricane Windstorm (SSI 1 to 5)	
LOSS EXPOSURE	**One year**	**Five year**
1% AGGREGATE DAMAGE EXCEEDANCE VALUE	$275 million	> $500 million
Storm Fund Annual Accrual	**Expected Fund Balance at 5 years**	**Probability of Insolvency within 5 years**
$75 million	$278 million	14.3%

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1. Hurricane Loss Analysis

Progress Energy Florida (PEF) transmission and distribution (T & D) systems are exposed to and in the past have sustained damage from hurricanes. The exposure of these assets to hurricane damage is described and potential losses are quantified. Loss analyses were performed by ABS Consulting, using an advanced computer model simulation program USWIND ™developed by EQECAT, an ABS Group Company. All results which are presented here have been calculated using USWIND, and the PEF provided T & D asset portfolio data.

The hurricane exposure is analyzed from a probabilistic approach, which considers the full range of potential storm characteristics and corresponding losses. Probabilistic analyses identify the probability of damage exceeding a specific dollar amount. USWIND™ is a probabilistic model designed to estimate damage and losses due to the occurrence of hurricanes. EQECAT proprietary computer software USWIND is one of only four models evaluated and determined acceptable by the Florida Commission on Hurricane Loss Projection Methodology (FCHLPM) for projecting hurricane loss costs (Reference 1).

Probabilistic Annual Damage & Loss is computed using the results of thousands of random variable storms. Annual damage and loss estimates are developed for each individual site and aggregated to overall portfolio damage and loss amounts. Damage is defined as the cost associated with repair and/or replacement of T & D assets necessary to promptly restore service in a post storm environment. This cost is typically larger than the costs associated with scheduled repair and replacement programs.

Factors considered in the analysis include the location of PEF's overhead and underground T & D assets, the probability of storms of different intensities and/or landfall points impacting those assets, the vulnerability of those assets to storm damage, and the costs to repair assets and restore electrical service.

Transmission and Distribution asset data are provided in the Tables 1-1 and 1-2 below.

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Table 1-1

Distribution Asset Replacement Values by County

Largest Counties

COUNTY	Asset Data
Pinellas	$1,189,469,699
Orange	$705,899,038
Seminole	$360,512,830
Pasco	$236,229,586
Volusia	$161,299,786
Polk	$150,465,496
Lake	$132,178,412
Marion	$123,568,978
Highlands	$107,664,842
Citrus	$94,413,256
Osceola	$58,506,490
Hernando	$25,284,291
Franklin	$23,872,114
Taylor	$17,646,506
All others	$129,422,062
TOTALS	$3,516,433,386

Table 1-2

Transmission Asset Replacement Value

	Asset Data
TOTALS	$1,795,938,687

Transmission and Distribution Asset Vulnerabilities

The PEF loss history from the 2004 hurricanes Charlie, Frances, Ivan and Jeanne were considered in the calibration of the storm loss model. These hurricanes provide data on recent storm recovery costs from moderate intensity events. The 2004 Hurricanes Frances and Jeanne were unusual in that they had similar landfalls, tracks and intensities. In addition, all four storms made landfall outside of PEF service territory and tracked through areas of PEF service with their highest winds mostly in areas of low asset concentrations. The 2004 storm loss experience includes the effects of many factors including the multiple storms tracks and the experience gained by storm restoration crews. The 2004 loss history is believed to be most reflective of the current PEF storm restoration practices and cost experience.

Loss Estimation Methodology

The basic components of the hurricane risk analysis include:

- **Assets at risk:** define and locate
- **Storm hazard**: apply probabilistic storm model for the region
- **Asset vulnerabilities:** severity (wind speed) versus damage
- **Portfolio Analysis:** probabilistic analysis -damage/ loss

Aggregate Damage Exceedance for One, Three, and Five Years

Aggregate damage exceedance calculations are developed by keeping a running total of damage from ***all possible events*** in a given time period. At the end of each time period, the aggregate damage for all events is then determined by probabilistically summing the damage distribution from each event, taking into account the event frequency. The process considers the probability of having zero events, one event, two events, etc. during the time period.

A series of probabilistic analyses were performed, using the vulnerability curves derived for PEF assets and the computer program USWIND™. A summary of the analysis is presented in Table 1-3, which shows the aggregate damage (i.e. deductible is "0") exceedance probability for three time periods: one, three and five years for damage layers between zero and over one billion dollars.

For each damage layer shown, the probability of damage exceeding a specified value is shown. For example, the probability of damage exceeding $100 million in one year is 5.3%, while it is 18.5% and 34.1% for a three and five year period. The analysis calculates the probability of damage from all storms and aggregates the total, resulting in increasing exceedance probabilities for the three and five year periods when compared to the one year value.

Table 1-3 provides the aggregate damage exceedance probabilities for the PEF T & D assets analyzed for a series of layers. Each layer has a layer amount of $25 million, except for the final layer which represents all damage $500 million and greater. The value in the first column, labeled Damage Layer, is the attachment point for each layer, with the exception of the last layer, for which the attachment point is $500 million.

The second column of the table, labeled 1 year Exceedance Probability, provides the 1-year modeled probability of penetrating each layer, i.e. the probability that the total damage from all events in a 1 year period will exceed the attachment point of the layer.

The third column of the table, labeled 3 year Exceedance Probability, provides the 3-year modeled probability of penetrating each layer, i.e. the probability that the total damage from all events in a 3 year period will exceed the attachment point of the layer.

The fourth column of the table, labeled 5 year Exceedance Probability, provides the 5-year modeled probability of penetrating each layer, i.e. the probability that the total damage from all events in a 5 year period will exceed the attachment point of the layer.

Table 1-3

PROGRESS ENERGY FLORIDA T & D ASSETS
AGGREGATE DAMAGE EXCEEDANCE PROBABILITIES

Damage Layer	1 Year	3 Year	5 Year
($millions)	Exceedance Probability	Exceedance Probability	Exceedance Probability
0 (≥.001)	43.0%	81.5%	94.0%
25	21.7%	54.0%	74.2%
50	13.7%	40.3%	61.6%
75	8.1%	27.2%	46.6%
100	5.3%	18.5%	34.1%
125	3.7%	13.4%	25.4%
150	2.7%	10.1%	19.7%
175	2.1%	7.9%	15.7%
200	1.7%	6.4%	12.7%
225	1.4%	5.2%	10.6%
250	1.1%	4.4%	8.9%
275	1.0%	3.7%	7.6%
300	0.8%	3.2%	6.5%
325	0.7%	2.8%	5.7%
350	0.6%	2.4%	5.0%
375	0.5%	2.1%	4.4%
400	0.5%	1.9%	3.9%
425	0.4%	1.7%	3.5%
450	0.4%	1.5%	3.1%
475	0.3%	1.3%	2.8%
>500	0.3%	1.2%	2.6%

2. Reserve Solvency Analysis

A probabilistic analysis of losses from hurricanes was performed for Progress Energy Florida (PEF) to determine their potential impact on the Storm Reserve. The analysis included Transmission and Distribution (T & D) damage as well as estimates of insurance deductibles paid on non-T & D assets.

Analysis

The Storm Reserve Solvency Analysis consisted of performing 10,000 iterations of hurricane loss simulations within the PEF service territory, each covering a 5-year period, to determine the effect of the charges for damage on the PEF Storm Reserve. Monte Carlo simulations were used to generate damage samples for the analysis. The analysis provides an estimate of the Storm Reserve assets in each year of the simulation, accounting for the annual accrual, expenses, and damage using a dynamic financial model.

Annual Reserve accruals from $40 million to $110 million were analyzed.

Assumptions

The analysis performed included the following assumptions

- Computations are performed on an after tax basis.
- All results are shown in constant 2004 Reserve dollars.
- Negative Storm Reserve Balances are assumed to be financed with an unlimited line of credit costing 2.5% after tax (2.5% after tax rate ≅ 3.75% pre tax rate x (1 - 38.58% PEF marginal tax rate).
- Negative Storm Reserve balances are recovered in rates over a 5 year period.
- The Storm Reserve will be utilized to recover property insurance policy deductibles.
- Property insurance policy deductibles are charged against the Storm Reserve. A $10million charge for deductibles is added to the simulated T&D losses in any simulated season where T&D losses exceed $100 million.

The analysis results for each of the trials analyzed are shown in Table 2-1 below. These results show for each Annual Reserve Accrual amount, the mean (expected) Storm Reserve Fund Balance as well as the probability that the Storm Reserve Fund Balance will be negative in any one or more of the five years of the simulated time horizon.

Table 2-1

**PROGRESS ENERGY FLORIDA T & D
STORM RESERVE FUND ACCRUALS AND
PROBABILITY OF STORM FUND INSOLVENCY**

Annual Reserve Accrual	Expected Storm Reserve Balance at end of 5 years	Probability of Insolvency within 5 years
($ millions)	($ millions)	%
$40	$109	32.9%
$50	$157	25.7%
$60	$204	20.6%
$70	$256	15.5%
$75	$278	14.3%
$80	$303	12.5%
$90	$352	10.7%
$100	$399	9.5%
$110	$446	8.7%

Figures 2-1 through 2-8 below show the results of the Storm Reserve Fund solvency analyses for annual reserve accruals from $40 million to $110 million. These results show the mean (expected) Storm Reserve Fund Balance as well as the 5th and 95th percentiles. All 1,000 Monte Carlo simulations assume an initial Storm Reserve Balance of zero.

For example, given a $75million Annual Storm Reserve Accrual, Figure 2-5 illustrates the expected performance of the Storm Reserve. The Storm Reserve has a mean (expected) Balance of $278 at the end of the five year period. The 5th percentile and 95th percentile 5 year ending Storm Reserve Balances are $74 million and $375million respectively. The Storm Fund has an 14.3% chance of insolvency in one or more years of the five year simulation. The likelihood of insolvency is greatest during the early years when the Storm Fund balance is low. This can be seen in years 1 and 2 where the 5th percentile and values are negative.

The first year of each simulation begins with a zero Reserve Balance. In the example above, the first year's annual accrual will bring the reserve balance to $75 million. Table 1-3, shows that the likelihood of storm damage exceeding $75 million in a single year is 8.1%. If there is no damage in year one, the storm fund will receive another $75 million reserve accrual to bring the second years balance to $150million. The likelihood of storm damage exceeding $150 million in a single year is 2.7%.

The accrual of $75 million is greater than the Expected Annual Damage from storms of $21.4 million. Therefore with each passing year, the Storm Reserve ending balance has an increasing likelihood of accumulating a surplus above the Expected Annual Damage. With increasing accruals in each year, the Storm Reserve has a greater chance of growing faster than storm damage can deplete the Fund.

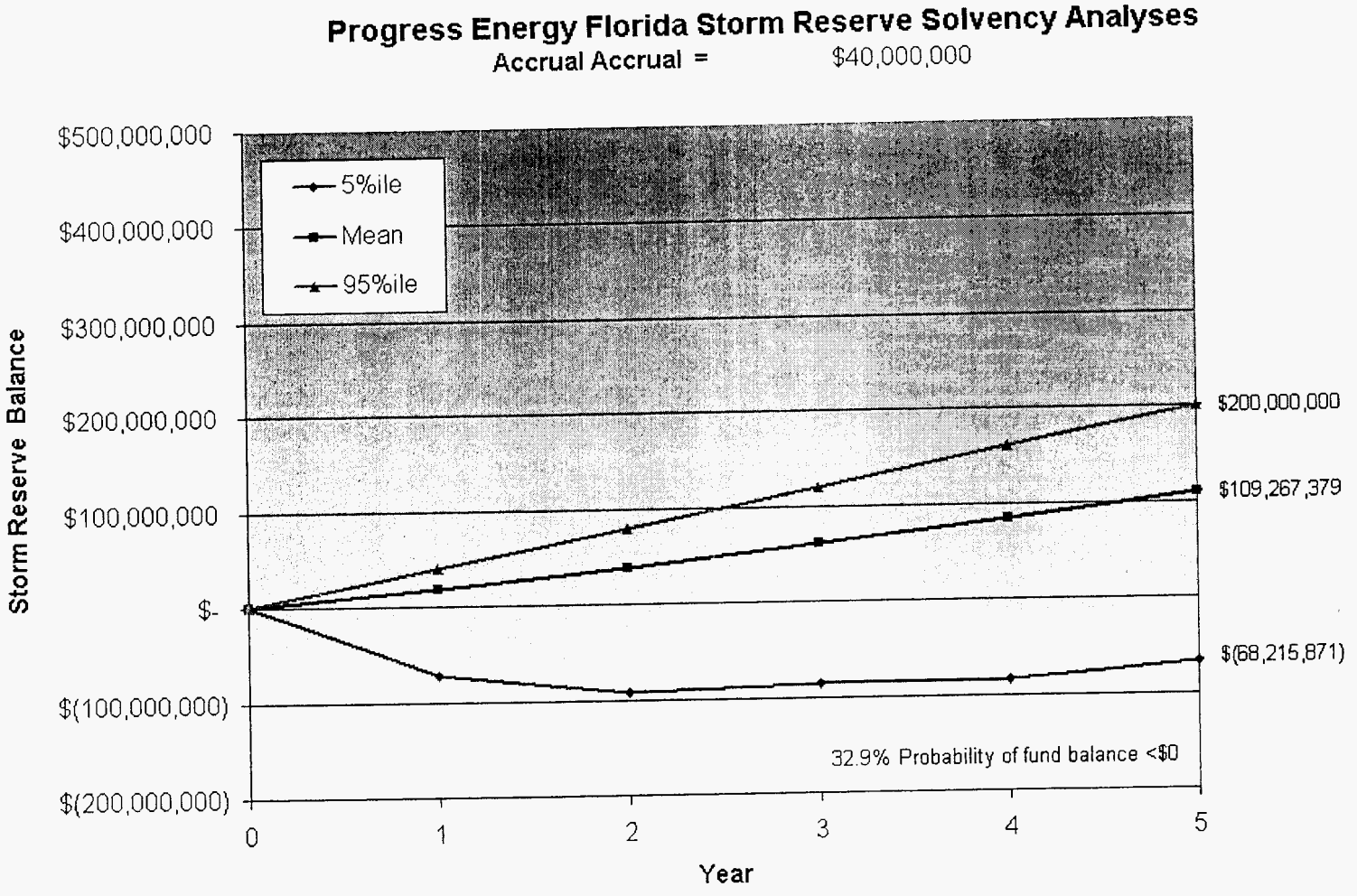

Figure 2-1: Storm Solvency Analysis Results $40 million Annual Accrual

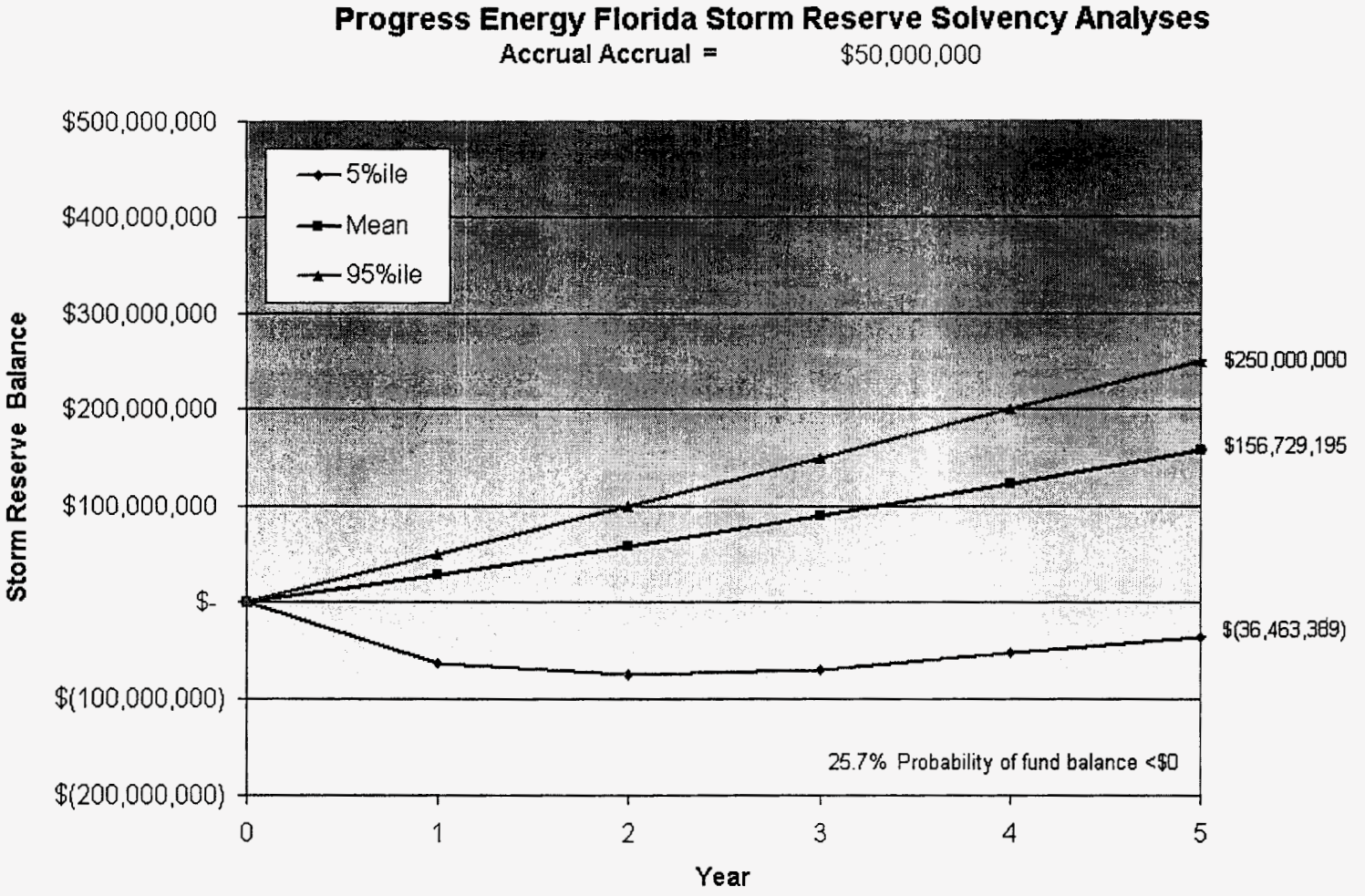

Figure 2-2: Storm Solvency Analysis Results $50 million Annual Accrual

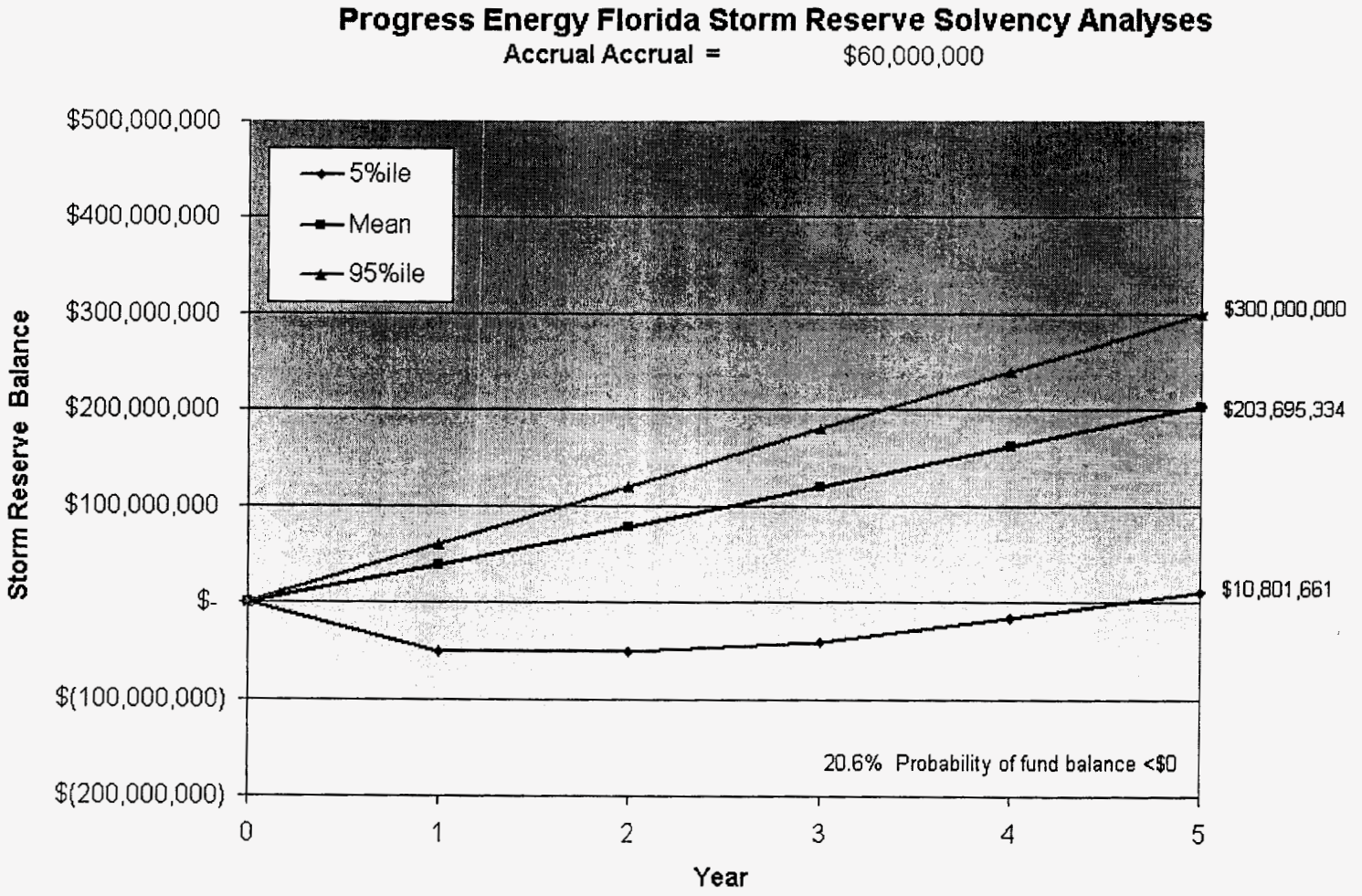

Figure 2-3: Storm Solvency Analysis Results $60 million Annual Accrual

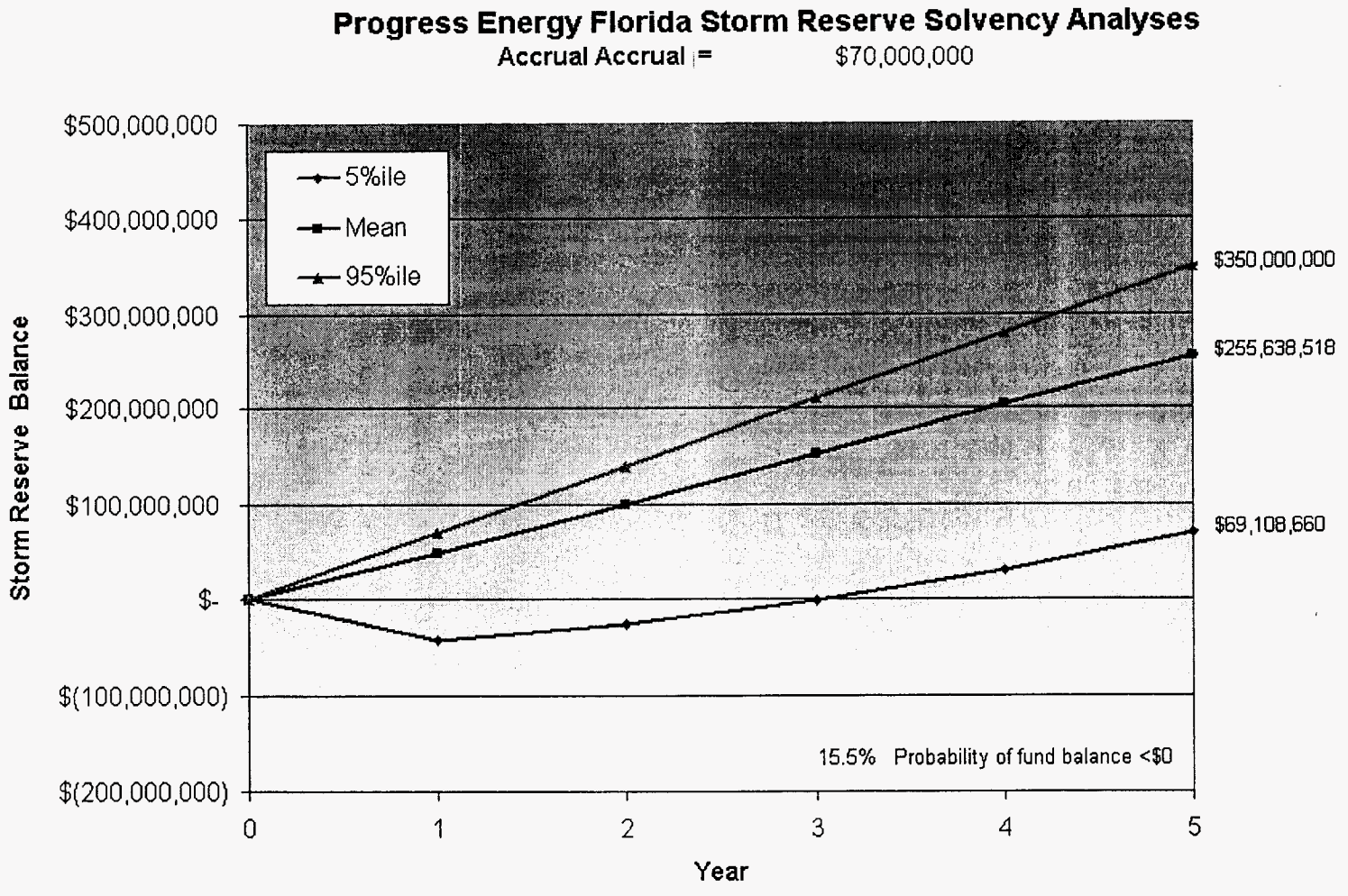

Figure 2-4: Storm Solvency Analysis Results $70 million Annual Accrual

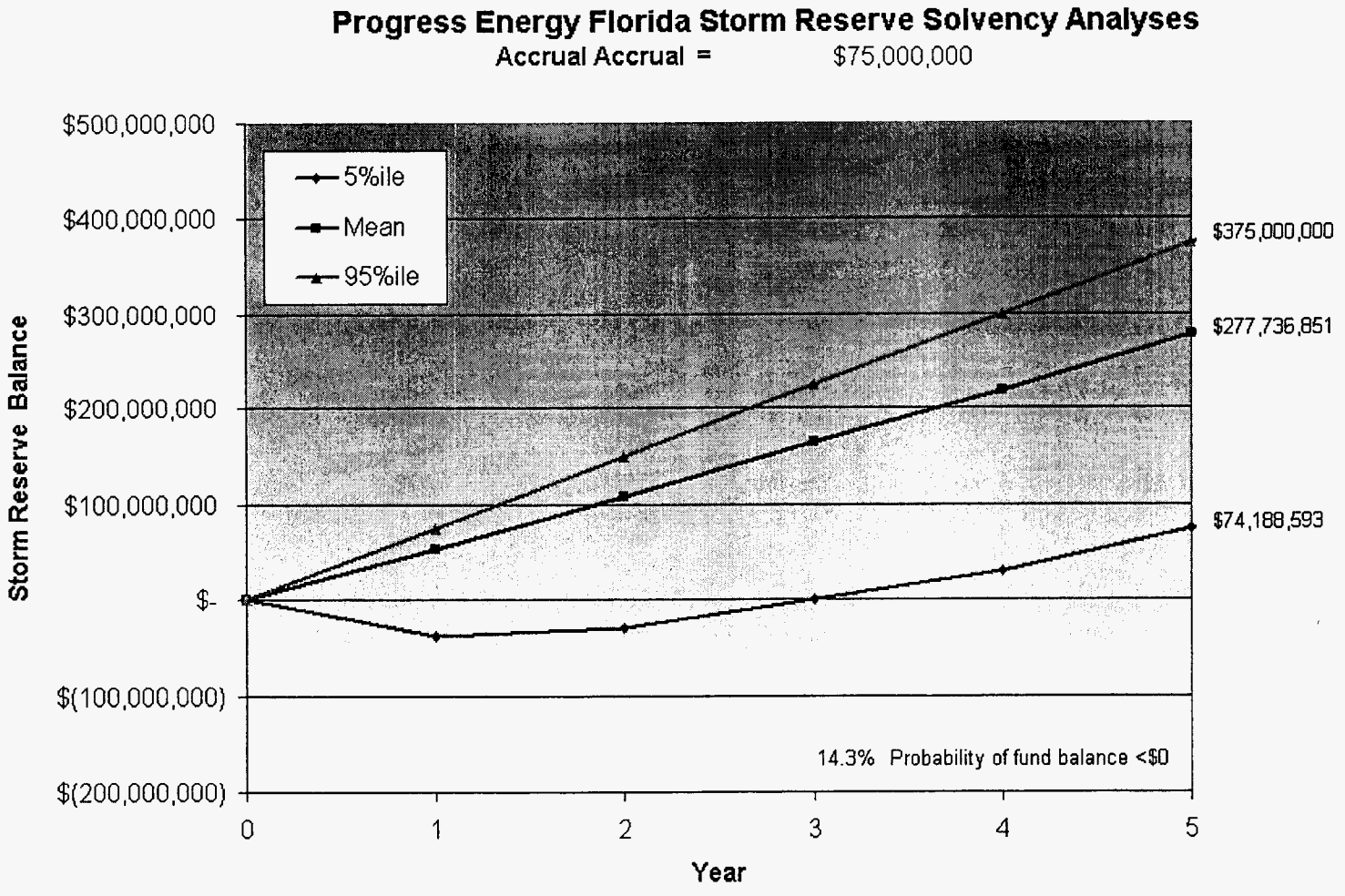

Figure 2-5: Storm Solvency Analysis Results $75 million Annual Accrual

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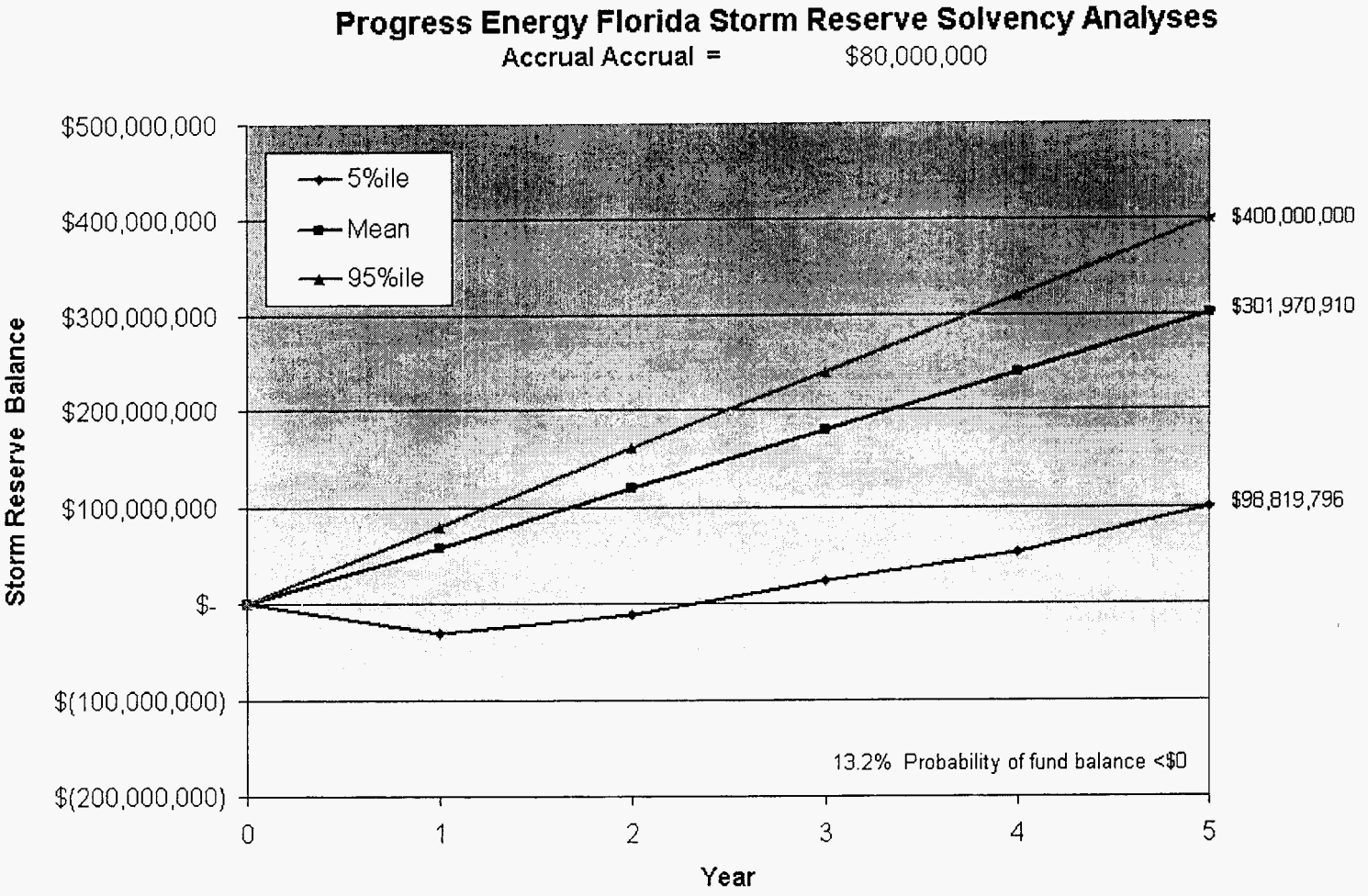

Figure 2-6: Storm Solvency Analysis Results $80 million Annual Accrual

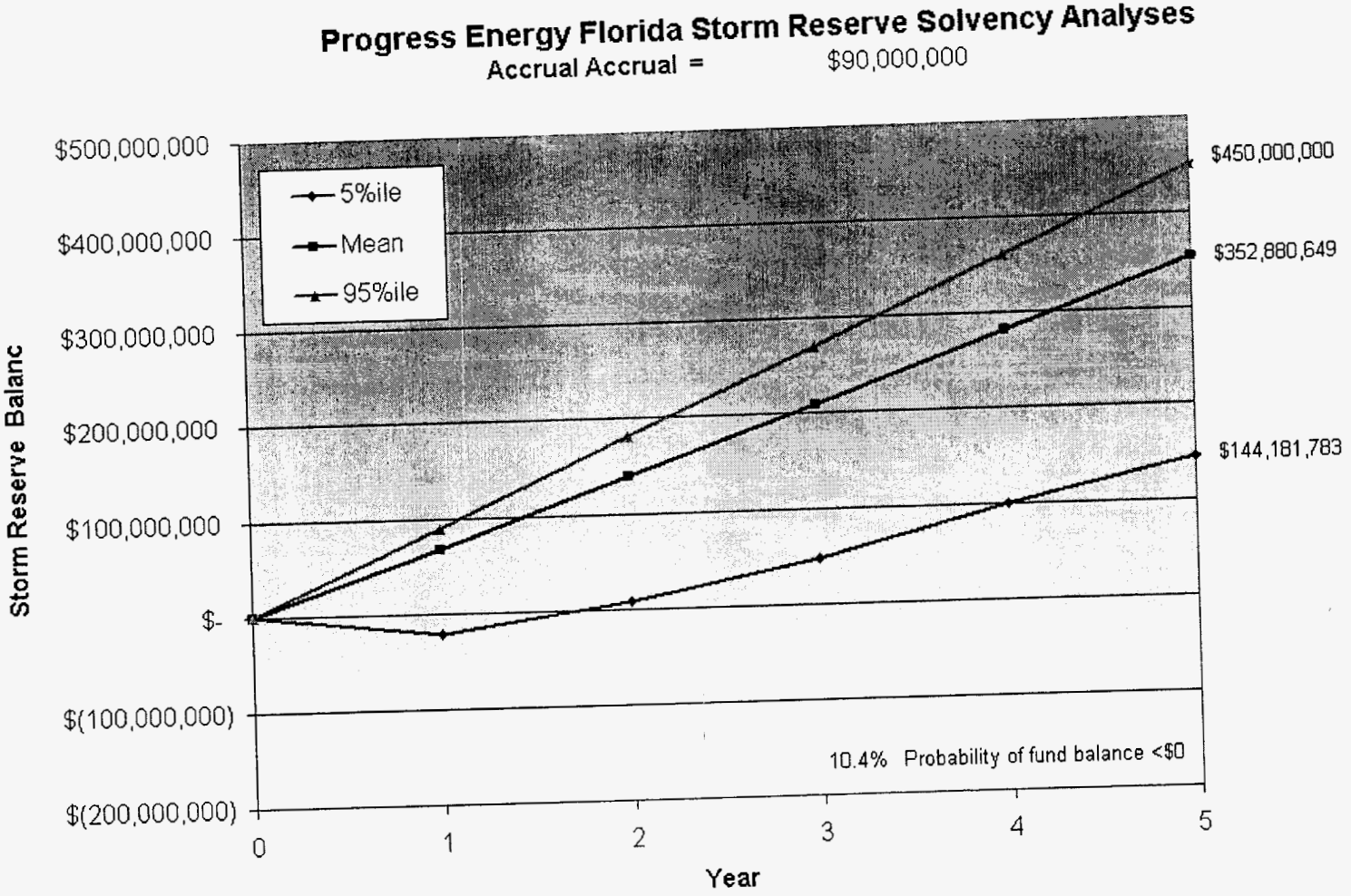

Figure 2-7: Storm Solvency Analysis Results $90 million Annual Accrual

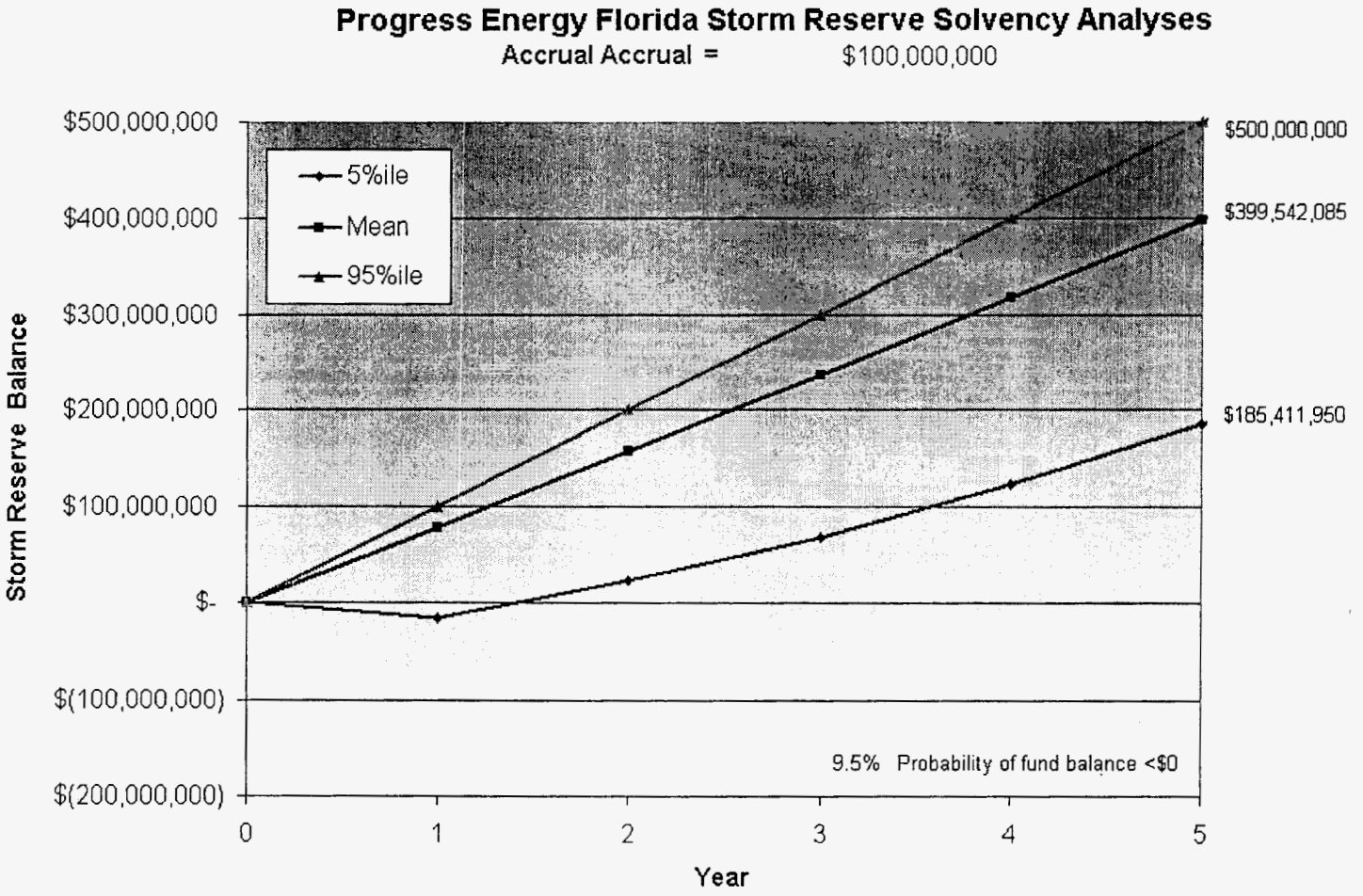

Figure 2-8: Storm Solvency Analysis Results $100 million Annual Accrual

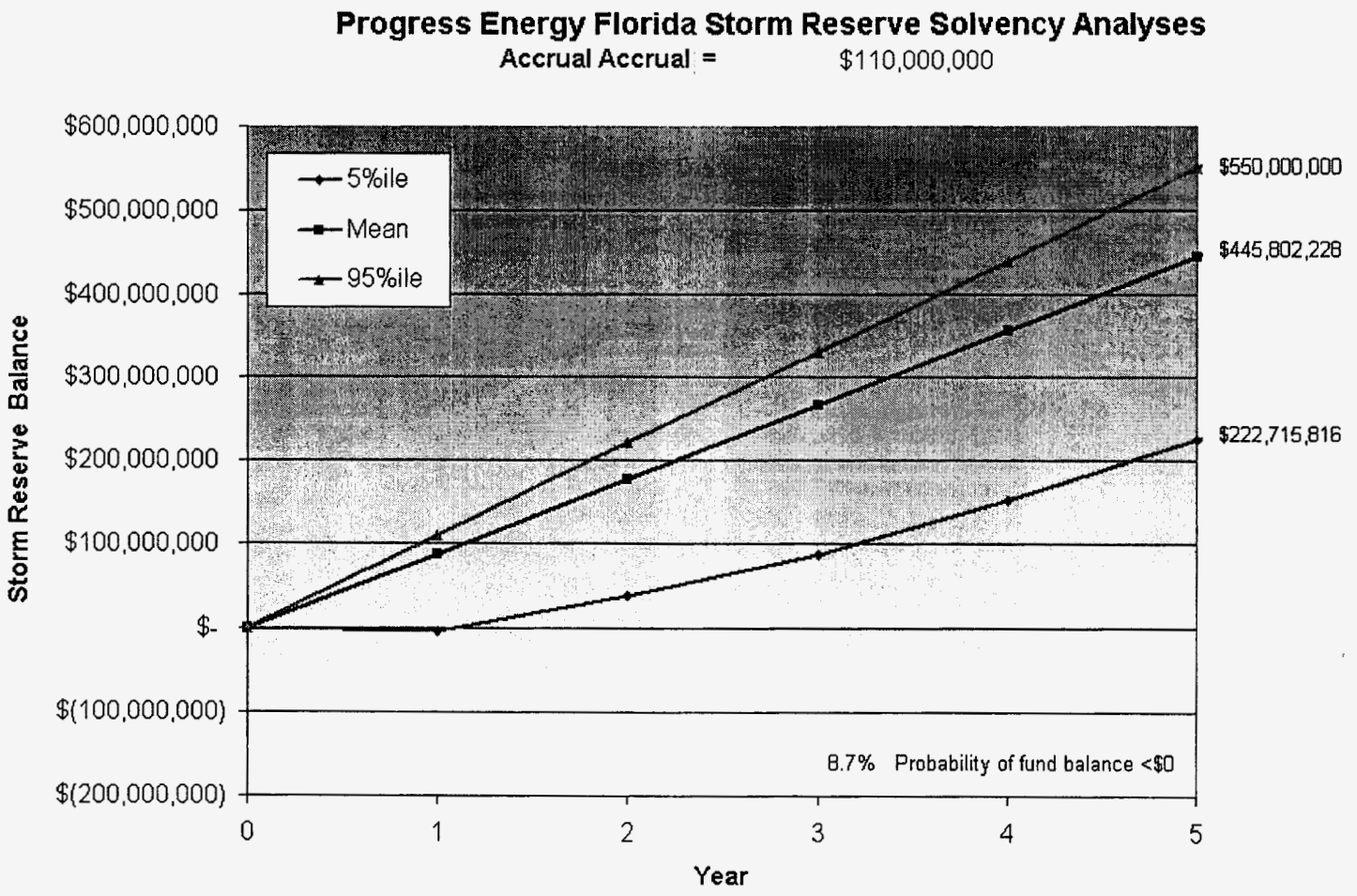

Figure 2-9: Storm Solvency Analysis Results $110 million Annual Accrual

3. References

1. "Florida Commission on Hurricane Loss Projection Methodology", EQECAT, an ABS Group Company, February 2004.

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