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Program Review

Florida Retirement System Pension Plan Valuation Met Standards

Report No. 10-46 June 2010

*Office of Program Policy Analysis & Government Accountability
an office of the Florida Legislature*



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Florida Monitor: www.oppaga.state.fl.us

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Gary R. VanLandingham, Ph. D., OPPAGA Director



The Florida Legislature

OFFICE OF PROGRAM POLICY ANALYSIS AND GOVERNMENT ACCOUNTABILITY



Gary R. VanLandingham, Ph.D., Director

June 2010

The President of the Senate,
the Speaker of the House of Representatives,
and the Joint Legislative Auditing Committee

Section 112.658, *Florida Statutes*, directs the Office of Program Policy Analysis and Government Accountability to review the actuarial valuation of the Florida Retirement System Pension Plan to determine whether the valuation complies with the Florida Protection of Public Employee Retirement Benefits Act, Ch. 112, Part VII, *Florida Statutes*. We also reviewed the results of the June 30, 2008 Experience Study of the Florida Retirement System conducted by the Department of Management Services' consulting actuary.

The results of these reviews are presented to you in this report. To complete the reviews, we contracted with Gabriel, Roeder, Smith & Company to serve as our actuarial consultant. Ed Madden, Legislative Analyst, conducted the review under the supervision of Kara Collins-Gomez, Staff Director.

We wish to express our appreciation to the staff of the Florida Department of Management Services for their assistance.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gary R. VanLandingham".

Gary R. VanLandingham, Ph. D
Director

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Summary

Florida Retirement System Pension Plan Valuation Met Standards

Our actuarial consultant, Gabriel, Roeder, Smith & Company, reviewed the Florida Retirement System's 2009 valuation report and June 30, 2008, experience study. With respect to the valuation report, our consultant concluded that the 2009 valuation was conducted in accordance with relevant state laws and rules and actuarial standards. It further concluded that the assumptions and methods used in the 2009 valuation were generally reasonable. The 2009 actuarial valuation determined that the plan had an unfunded actuarial liability totaling \$15.4 billion as of July 1, 2009. The Pension Plan experienced an actuarial loss of \$18.37 billion, primarily due to investment losses. The 2009 actuarial valuation also shows that the plan's funding status (as measured by the ratio of its assets to liabilities) has experienced a decline over the last nine fiscal years (from 118% in Fiscal Year 1999-00 to 88% in Fiscal Year 2008-09). With respect to the experience study, our consultant concluded that the assumptions used in the valuation were generally reasonable and appropriate; however, it noted the inactive mortality rates appear to be conservative.

Our consultant also made several noteworthy observations and recommendations. For example, our consultant noted that the 2009 valuation disclosed the actuarial present value of future benefits and the actuarial present values of future pay. However, these values do not take into account an assumption for the probability that system members will participate in the Deferred Retirement Option Program (DROP). As a result, it continues to recommend that future valuations include such disclosures that fully reflect the effect of expected DROP participation (page 26).

Additionally, our consultant continues to recommend that the valuation be improved by providing prior year results in a side-by-side comparison with current year results as appropriate. This would provide a ready comparison of changes in values and percentage changes in the Florida Retirement System's membership, assets, and benefits, as specified in the *Florida Administrative Code* (pages 31 to 34).¹

Gabriel, Roeder, Smith & Company's report on the 2009 actuarial valuation is presented in its entirety in Appendix A, beginning on page 11. The consultant's letter report on the experience study is presented in its

¹ Rule 60T-1.003, *F.A.C.*

entirety in Appendix B, beginning on page 47. The Secretary of the Department of Management Services provided a written response to our preliminary report, which is reprinted in Appendix C, page 67.

Florida Retirement System Pension Plan Valuation Met Standards

Scope

Section 112.658, *Florida Statutes*, directs the Office of Program Policy Analysis and Government Accountability (OPPAGA) to review the 2009 actuarial valuation of the Florida Retirement System Pension Plan to determine whether it complies with provisions of the Florida Protection of Public Employee Retirement Benefits Act.² The Act establishes reporting and disclosure standards for actuarial reports on state and local government retirement plans. These reports must address the adequacy of employer contribution rates, assess the plan's assets and projected liabilities, and use actuarial cost methods approved by the Employee Retirement Income Security Act of 1974 and as permitted under regulations prescribed by the U.S. Secretary of the Treasury. The Act requires OPPAGA to use the same actuarial standards the Department of Management Services uses to monitor local government pension plans.

OPPAGA's review objectives were to determine whether the Department of Management Services' consulting actuary conducted the 2009 actuarial valuation of the Florida Retirement System Pension Plan using generally accepted and statutorily required standards, methods, and procedures; whether the valuation's results were reasonable; and whether the plan continued to have sufficient assets to pay future benefits when due. To complete this review, OPPAGA contracted with Gabriel, Roeder, Smith & Company to serve as its actuarial consultant. In addition to providing a review of the Fiscal Year 2008-09 actuarial valuation, our consultant also reviewed the results of a recently completed experience study conducted by the Department of Management Services' consulting actuary for the period July 1, 2003, through June 30, 2008.

² Sections 112.60-67, *F.S.*

Background

Florida law requires the Department of Management Services to conduct an actuarial valuation of the Florida Retirement System (FRS) pension plan annually, with the results reported to the Legislature by December 31 prior to the next legislative session.

Actuarial valuations are made for several reasons:

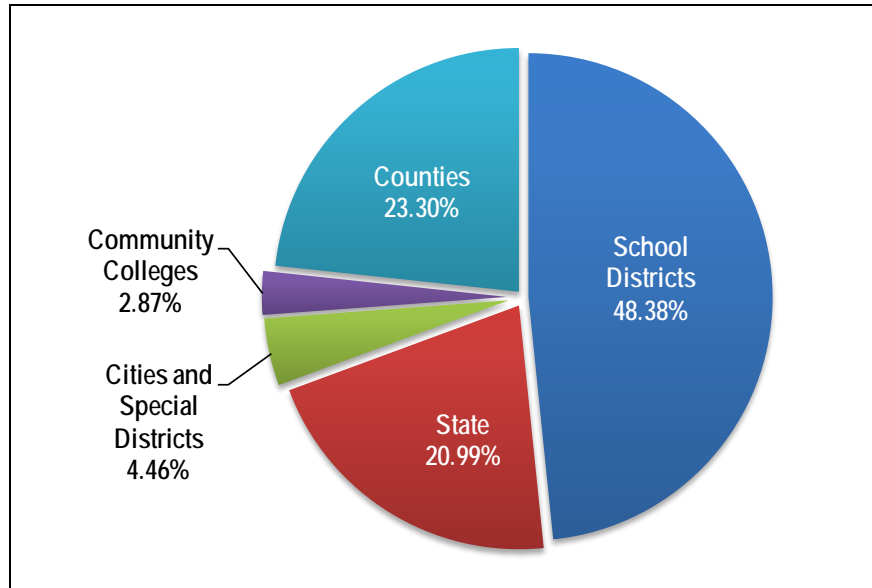
- to determine the contribution rates needed to cover the plan's normal costs (the percentage of salary needed to be contributed each year to cover the cost of future benefits owed system members);
- to determine the contribution rates needed to amortize any unfunded actuarial liability (the amount of pension liabilities not covered by contributions made at the normal cost rate or by investment of plan assets); and
- to assess the system's funding status (the ability of system assets to cover its liabilities).

Florida Retirement System members may join one of two retirement benefit options—the Pension Plan or the Investment Plan. The **FRS Pension Plan** is a defined benefit plan, meaning that the employer invests employer contributions to employees' retirement benefits. The employer guarantees a certain level of benefit payment and bears the risk that investment returns will not support that level of benefits. Participants' retirement benefits are based upon a formula taking into account factors such as their salary levels, years of service, compensation, and FRS membership class. The **FRS Investment Plan**, or Public Employee Optional Retirement Program, is a defined contribution plan. Investment plan participants are guaranteed a certain level of contributions from their employers and the participants select how these funds will be invested from a list of authorized investment accounts. Participants bear the risk of poor investment returns, but after meeting certain requirements, participants can take their retirement accounts with them if they no longer work with an employer participating in the FRS.

The FRS Pension Plan provides benefits to state employees and employees of local school districts, counties, certain cities, community colleges, and state universities. As shown in Exhibit 1, in Fiscal Year 2008-09, state employees constituted 20.99% of plan members, while school district employees made up nearly half (48.38%) of plan participants.³ The remaining plan members were county, community college, city, and special district employees.

³ The number of state employees includes state government and State University System employees.

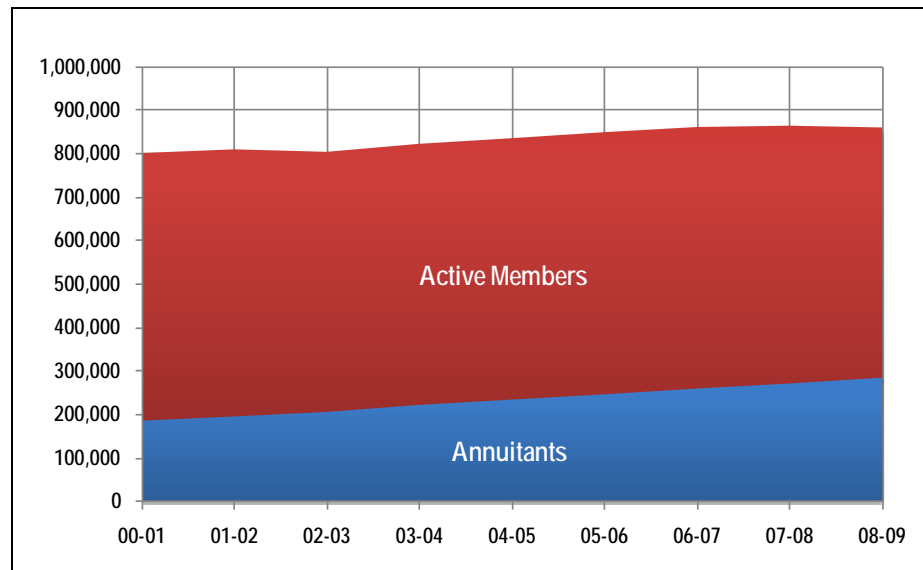
**Exhibit 1
State Employees Comprise Only 21% of Florida Retirement System
Pension Plan Membership**



Source: The Florida Retirement System Annual Report, July 1, 2008 – June 30, 2009.

Over the past 30 years, the plan has experienced significant growth overall in the number of active members and annuitants (retirees or their beneficiaries receiving retirement payments). Specifically, between Fiscal Years 1980-81 and 2008-09, the number of active system members increased from 393,894 to 572,591 (45.37%). During this same period, the number of system annuitants increased from 59,533 to 286,674 (381.54%). Exhibit 2 shows the growth in active members and annuitants since Fiscal Year 2000-01.

Exhibit 2
The Overall Number of FRS Members and Annuitants Has Increased Since Fiscal Year 2000-01¹



¹ Data presented in this exhibit excludes (1) FRS Pension Plan members who are in the Deferred Retirement Option Program (DROP) and (2) terminated vested members (persons who are vested and are no longer working for a government entity participating in the system, but have not begun to receive retirement benefits). The 2009 actuarial valuation indicates that the FRS Pension Plan has 32,921 DROP members and 89,481 terminated vested members as of July 1, 2009.

Source: Division of Retirement documents and the Florida Retirement System Actuarial Valuation as of July 1, 2009.

The Department of Management Services' Division of Retirement administers the Florida Retirement System Pension Plan. Pension benefits and all division operating expenses are paid from revenues deposited in the Florida Retirement System Trust Fund. For Fiscal Year 2008-09, the Legislature provided the division spending authority of \$35.04 million.⁴

The State Board of Administration invests FRS Pension Plan assets. The market value of the pension fund, as of June 30, 2009, was \$99.6 billion. The market value of the pension fund as of April 30, 2010 increased to \$118.2 billion. During Fiscal Year 2008-09, the Florida Retirement System paid \$5.67 billion in pension payments to retired, disabled, or beneficiary members.

The department contracted with Milliman to conduct the Pension Plan's 2009 actuarial valuation and the experience study for the period July 1, 2003 through June 30, 2008.

⁴ The Division of Retirement's operating budget includes \$15.8 million in general revenue that is primarily used to pay supplemental retirement benefits for Florida National Guard retirees receiving a federal pension. These funds are also used to provide benefits to disabled judges involuntarily retired by the Florida Supreme Court and certain teachers and public officers pursuant to ss. 238.171 and 112.05, *F.S.*

Findings

The pension plan's 2009 valuation is based on the results of a recently completed experience study

Experience studies typically are performed every five years to compare actual plan experience with the assumptions used in the actuarial valuation. The department's consulting actuary conducted an experience study for the period July 1, 2003 through June 30, 2008. The study focused on the incidence of normal retirement, mortality, disability, and withdrawal from the pension fund, and pay raises.

Based on the findings of the experience study, the department's consulting actuary recommended changes to the assumptions used to perform the actuarial valuation. The proposed changes, which were approved by the Florida Retirement System Actuarial Assumption Conference, included adjustments to active and inactive mortality rates, early retirement rates, and non-duty and in line-of-duty disability rates. The changes, when combined with recent legislative changes to the retirement system and the elimination of the pension surplus, resulted in the system actuary recommending increased normal cost contribution rates for employers of Deferred Retirement Option Program (DROP) participants and Regular, Special Risk, and Elected Officers' Class members. These modified rates were included in 2010 legislation that was vetoed by the Governor.⁵ As a result, Fiscal Year 2010-11 employer contributions will be based on normal cost contribution rates approved by the 2009 Legislature, which are less than the rates needed to fully fund the pension fund.

⁵ The 2010 Legislature passed House Bill 5607 that would have reduced the interest rate paid on DROP benefits and revised the employer payroll contribution rates for FRS membership classes effective July 1, 2010 and July 1, 2011. The bill was vetoed on May 28, 2010.

The pension plan's 2009 valuation was conducted in accordance with standards, and its assumptions and methods are reasonable

Our consulting actuary, Gabriel, Roeder, Smith & Company, concluded that the assumptions and methods used in the 2009 valuation were reasonable and generally complied with relevant state laws and rules and actuarial standards. However, our consulting actuary continued to note that the valuation's treatment of the Deferred Retirement Option Program (DRO) is nontraditional and could conflict with government accounting standards and generally accepted actuarial standards of practice. Specifically, the consulting actuary reported that two methods were used to treat the DRO. The Department of Management Services' consulting actuary uses one method to determine the effect of the DRO on the actuarial valuation and for measurement of the system's surplus and uses a second method to determine the required contribution rate for each employee class. This method adds complexity to the system, increases costs for each actuarial study that includes a DRO analysis because the calculations must be completed twice, and shifts a portion of the cost of funding the DRO to Regular Class employers.⁶

Our consulting actuary also concluded that the method used to determine the effect on the actuarial valuation did not reflect the probability of future DRO participation by active members. A method that factors in the future DRO participation by active members would have increased the unfunded actuarial liability by more than \$2 billion in the reported July 1, 2009 valuation, from \$15.4 billion to \$17.6 billion.

The Gabriel, Roeder, Smith & Company report on the 2009 actuarial valuation is presented in its entirety in Appendix A.

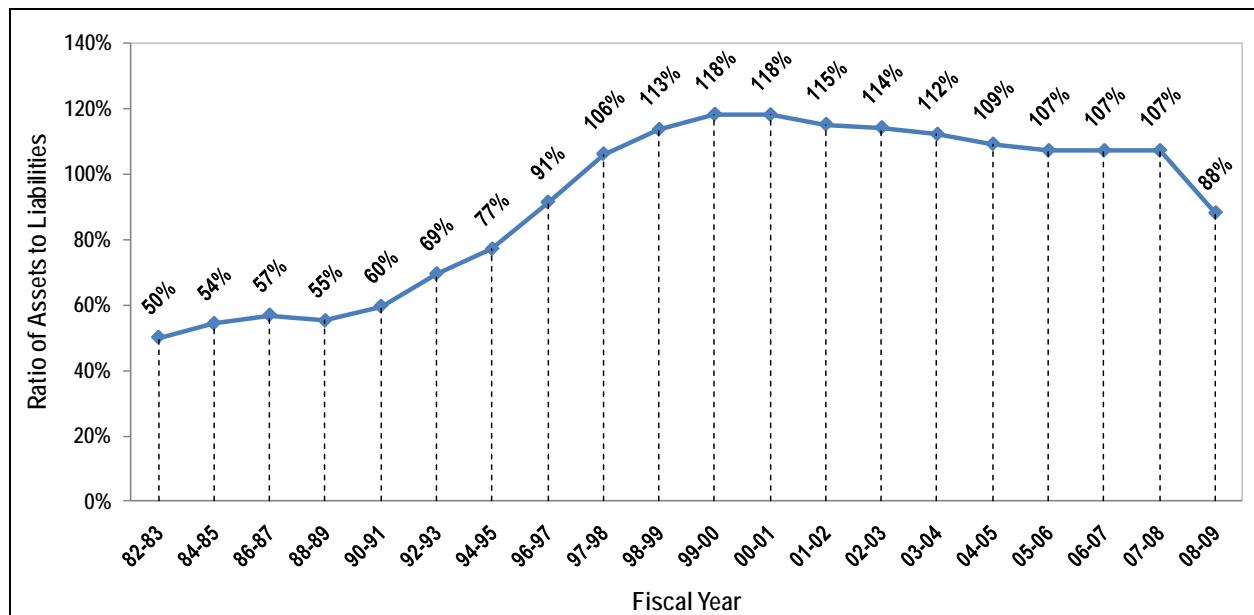
⁶ A March 2010 OPPAGA report, *DRO Could Be Improved by Defining Its Purpose, Standardizing Requirements, and Ensuring That Benefits Are Equitably Funded*, [Report No. 10-28](#), concluded that there is substantial cost shifting between employer groups because the system uses a single contribution rate for all DRO participants. As a result, entities such as school districts that primarily employ workers in FRS's Regular Class subsidize contributions for other entities that have DRO participants in other retirement classes.

In 2009, the actuarial value of pension fund assets decreased significantly and the plan is no longer fully funded

Actuarial valuations provide a means to assess whether a pension plan is making progress in improving its funding status. One indicator of a plan's funding status is the sufficiency of its assets in covering benefit liabilities.

In Fiscal Year 2008-09, the FRS Pension Plan experienced an actuarial loss of \$18.37 billion. As shown in Exhibit 3, the plan's ratio of assets to liabilities increased from Fiscal Year 1982-83 to 2007-08 (from 50% to 107%), but declined significantly to 88% in Fiscal 2008-09. This decline was primarily due to lower than expected investment returns.⁷

Exhibit 3
Pension Plan Funding Status Decreased Significantly Last Fiscal Year



Source: Division of Retirement documents and the Florida Retirement System Actuarial Valuation as of July 1, 2009.

⁷ Declines in funding status over the years can also be attributed in part to the rate stabilization mechanism and the use of surplus funds to increase pension benefits, such as retroactively increasing pension benefits for certain member groups. The rate stabilization mechanism is specified in s. 121.031(3)(f), *F.S.*, and was designed to recover a portion of the surplus through reduced employer contributions while minimizing the risk of future increases in contribution rates.

Recommendations

Based on the review by Gabriel, Roeder, Smith & Company, we continue to make the following recommendations.

- We recommend that the actuarial valuation of the Florida Retirement System include disclosures of the normal costs and actuarial gains and losses fully reflecting the DROP, as well as the disclosure of the present value of future benefits fully reflecting the DROP. Inclusion of these disclosures would provide valuable information to the Legislature regarding the DROP.
- We recommend that the actuarial valuation provide prior year results along with side-by-side current year results as appropriate. This information would provide a ready comparison both in terms of changes in values and in terms of percentage changes in the Florida Retirement System's membership, assets, and benefits.
- We recommend that the DROP be funded in a traditional manner because the current method adds complexity to the system, increases costs for each actuarial study that includes a DROP analysis because the calculations must be completed twice, and shifts a significant portion of the cost of funding the DROP to Regular Class employers.

Appendix A



ACTUARIAL REVIEW

OF THE

July 1, 2009 Actuarial Valuation

of the

Florida Retirement System

FOR THE

OFFICE OF PROGRAM POLICY ANALYSIS

AND GOVERNMENT ACCOUNTABILITY

Submitted by:

GRS

Gabriel Roeder Smith & Company

June 7, 2010

ACTUARIAL REVIEW - JULY 1, 2009 ACTUARIAL VALUATION OF THE
FLORIDA RETIREMENT SYSTEM

Gabriel Roeder Smith & Company

ACTUARIAL REVIEW - JULY 1, 2009 ACTUARIAL VALUATION OF THE
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June 7, 2010

Mr. Gary VanLandingham
Director
Government Operations Policy Area
Office of Program Policy Analysis
and Government Accountability
111 West Madison St., Suite 312
Tallahassee, Florida 32399-1475

Re: FRS Actuarial Review

Dear Mr. VanLandingham:

As requested, we have completed our actuarial review of the July 1, 2009 Actuarial Valuation Report of the Florida Retirement System (FRS) prepared by Milliman.

Based upon this actuarial review, we find the actuarial assumptions and methods generally appropriately develop actuarial values of the System. We have also replicated key financial results of the July 1, 2009 Actuarial Valuation and find no material differences in the valuation results.

Our specific findings are:

1. The Department of Management Services' actuaries are generally in compliance with the requirements of Florida Statutes, Department rules, government accounting standards and actuarial standards of practice regarding their actuarial valuation of FRS. We have identified a few areas where consideration of refinement may be warranted.
2. The Department's actuaries for the most part use generally accepted actuarial cost methods, bases for assumptions and reporting standards. We have similarly identified areas where documentation and considerations or refinements may be warranted.
3. The specific economic and demographic assumptions used are arrived at from a sufficient level of detail considered and are generally reasonable in light of recent experience. While not unreasonable, the inactive healthy mortality rates appear conservative.
4. The Department's actuaries provide sufficient information as to the causes of gains, losses and net change in the unfunded liability to allow evaluation of specific factors. Additional disclosures and refinements may add value.
5. The Department's actuaries' actuarial report for the most part adequately provides necessary information that another actuary, unfamiliar with the situation, would find information to appraise the findings and arrive at reasonably similar results. FRS is a complicated System. We have identified information of a comparative nature that would be helpful in this regard.

Mr. Gary VanLandingham
June 7, 2010
Page Two

6. We have found other aspects of the Department's actuaries' report where further disclosure and further consideration may be warranted.

We wish to thank Mr. Garry Green and Mr. Robert Dezube of Milliman for their assistance without which this review could not have been completed.

We look forward to responding to any questions or comments from the interested parties. If you should have any question concerning the above, please do not hesitate to contact us.

Sincerest regards,



Lawrence F. Wilson, A.S.A.
Senior Consultant and Actuary



Jennifer M. Borregard
Senior Analyst

Enclosure

Gabriel Roeder Smith & Company

ACTUARIAL REVIEW - JULY 1, 2009 ACTUARIAL VALUATION OF THE
FLORIDA RETIREMENT SYSTEM

Introduction

Gabriel Roeder Smith & Company

ACTUARIAL REVIEW - JULY 1, 2009 ACTUARIAL VALUATION OF THE
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I. Introduction

As a matter of policy the Office of Program Policy Analysis and Government Accountability (OPPAGA) engages an independent reviewing actuary to conduct various actuarial reviews and analysis. The scope of this work includes an actuarial review of the annual actuarial valuation report and periodic experience study.

The work to be reviewed is produced by the current Department of Management Services' actuaries - Milliman with Mr. Robert Dezube as FRS actuary.

This actuarial review is a review of the July 1, 2009 Actuarial Valuation Report and includes a replication of the July 1, 2009 Actuarial Valuation.

The scope of this project is limited to reviewing the work of Milliman to the degree necessary to express opinions regarding the accuracy and reasonableness of the following:

1. Compliance with the requirements of Florida Statutes, Department rules, government accounting standards and actuarial standards of practice regarding their actuarial valuation of FRS.
2. Use of generally accepted actuarial cost methods, bases for assumptions and reporting standards.
3. Use of specific economic and demographic assumptions arrived at from a sufficient level of detail considered and are generally reasonable in light of recent experience.
4. Provision of sufficient information as to the causes of gains, losses and net change in the unfunded liability to allow evaluation of specific factors.
5. Adequacy of actuarial report in providing necessary information that another actuary, unfamiliar with the situation, would find information to appraise the findings and arrive at reasonably similar results.
6. Aspects of the Department's actuaries work and report that are insufficient.

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Executive Summary

Gabriel Roeder Smith & Company

ACTUARIAL REVIEW - JULY 1, 2009 ACTUARIAL VALUATION OF THE
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II. Executive Summary

We have reviewed the July 1, 2009 Actuarial Valuation Report prepared by Milliman (Department of Management Service's retained valuation actuaries). We find the actuarial assumptions and methods generally develop appropriate actuarial values for FRS. We have also replicated the results of the July 1, 2009 Actuarial Valuation and find no material differences in the valuation results.

In reviewing actuarial assumptions and methods, it is important to recognize that there is not a single *correct* set of actuarial assumptions and methods. There is a range of reasonableness within which individual assumptions, methods and the entire valuation basis may fall. Assumptions may be characterized as conservative (producing relatively higher near term contributions) or aggressive (producing relatively lower near term contributions) within this range. Similarly acceptable actuarial methods impact the incidence of required contributions.

In this light, we have the following comments on the July 1, 2009 Actuarial Valuation.

1. **Compliance with requirements of the Florida Statutes, Department rules, government accounting standards and actuarial standards of practice:** Overall, the actuarial valuation is compliant with these requirements. However, the treatment of the Deferred Retirement Option Program (DROP) appears to be somewhat nontraditional.
2. **Use of generally accepted actuarial cost methods, bases for assumptions and reporting standards:** Generally, the Actuarial Valuation meets these requirements. The treatment of the Deferred Retirement Option Program (DROP) may be a somewhat nontraditional *actuarial cost method*.
3. **Economic and demographic assumptions arrived at from a sufficient level of detail considered and collective effect of all assumptions:** For the most part, the actuarial assumptions are reasonably related to plan experience based upon the results of the latest Experience Study. While not unreasonable, the inactive healthy mortality rates appear conservative. We find the actuarial assumptions internally consistent including consistent recognition of anticipated inflation in the economic assumptions.
4. **Disclosure of sources of gains and losses:** Actuarial gains and losses are identified by source in sufficient detail to evaluate specific factors (i.e. investment return, salary increases, etc.). The reported actuarial loss for the year ended June 30, 2009 was \$18.370 billion based upon the actuarial assumptions used for funding in the July 1, 2008 Actuarial Valuation - \$18.704 billion loss on investments offset by \$0.334 billion gain on liabilities. The reported actuarial loss for the change in actuarial assumptions used for funding was \$5.854 billion. For the previous year ended June 30, 2008, there was a reported actuarial loss of \$0.645 billion. The reported actuarial gains and losses are impacted by the somewhat nontraditional treatment of the DROP.

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The actuarial value of assets as of June 30, 2009 exceeds the market value of assets by \$19.794 billion. These deferred investment losses will need to be recognized over the next four years. As of June 30, 2008 the actuarial value of assets exceeded the market value of assets by \$3.802 billion – a \$15.992 billion swing in one year, which will offset the impact of favorable investment returns over the next few years.

As a subsequent event, the actuarial valuation report shows the market value of assets reported increased from \$98.97 billion as of June 30, 2009 to \$110.05 billion as of September 30, 2009. If the market value of assets as of June 30, 2010 is \$110.05 billion, the market value return on System assets during 2009-10 will be 14.97%. While this is above the expected investment return of 7.75%, the unfunded accrued liability would still be expected to increase due to recognition of deferred investment losses and the lag in funding.

We have noted, while not unreasonable, the inactive healthy mortality rates appear conservative. The System experienced an actuarial gain of \$8.9 million sourced from retiree mortality indicating a better fit based upon the less conservative prior mortality assumption.

Additional disclosures and refinement may be warranted.

5. **Disclosure of sufficient information that another actuary, unfamiliar with the situation, could appraise the findings and arise at similar results:** The actuarial valuation provides significant information. FRS is complicated and the methods employed for certain benefits (DROP), the allocation of contribution requirement by Class and the use of the Rate Stabilization Mechanism (not applicable this year) are somewhat non-traditional. We note that some additional side-by-side comparisons of current and prior year results were added this year, as suggested last year.
6. **Other aspects of the Valuation:** The actuarial valuation report provides significant information. We believe disclosures of the present value of benefits and actuarial gain / (loss) fully reflecting expected future DROPs continue to be appropriate. The method used to determine the actuarial value of assets may warrant further review.

ACTUARIAL REVIEW - JULY 1, 2009 ACTUARIAL VALUATION OF THE
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Analysis

and

Recommendations

Gabriel Roeder Smith & Company

ACTUARIAL REVIEW - JULY 1, 2009 ACTUARIAL VALUATION OF THE
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III. Analysis and Recommendations

The following are detailed analysis and recommendations based upon our examination and review of the work of the Department of Management Services' actuaries as evidenced by the July 1, 2009 Actuarial Valuation Report to determine whether:

- A. *The Department of Management Services' actuaries are in compliance with the requirements of the Florida Statutes, Department rules, government accounting standards and actuarial standards of practice regarding their actuarial valuation of the Florida Retirement System pension plan.*

Overall, we believe the actuarial valuation is compliant with these requirements.

However, we believe some of the requirements of the Florida Statutes and Department rules could conflict with government accounting standards and generally accepted actuarial standards of practice. The nontraditional treatment of the DROP appears to have a significant impact on the size of the reported unfunded accrued liability (\$15.4 billion – no future DROPs vs. \$17.6 billion expected future DROPs).

Actuarial Cost (Funding) Method: An actuarial cost method is a set of techniques for conversion of the actuarial present values of benefits into contribution requirements. Actuarial methods are characterized by:

1. Normal Cost – the cost of the system without consideration of funded status.
2. Actuarial Accrued Liability – the assets which would have accumulated to date had contributions been made at the level of the normal cost since the date of the first benefit accrual, all actuarial assumptions had been exactly realized and there had been no benefit changes.

The total contribution produced by an actuarial cost method is the total of the normal cost and an amount to amortize any unfunded actuarial accrued liability.

The method used in the valuation for FRS is the Entry Age Normal Method. The normal cost under this method is the annual cost, expressed as a level percentage of pay, which will support the benefits of the System. Entry Age Normal is the most prevalent funding method in the public sector. It is appropriate for the public sector, in part, because it produces costs that remain stable as a percentage of payroll over time, resulting in intergenerational equity for taxpayers.

There are a couple of areas in which the application of the Entry Age Normal Method in the FRS

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valuation is non-traditional. **First**, we note that a surplus (excess of actuarial value of assets over actuarial accrued liabilities) does not exist this year, but in years in which a surplus does exist, its use is governed by Florida Statute – Rate Stabilization Mechanism.

Specifically, F.S., 121.031(3)(f) requires application of the Rate Stabilization Mechanism (RSM) for determining the amount of any surplus to be recognized in any given year as follows:

- f) *The actuarial model used to determine the adequate level of funding for the Florida Retirement System shall include a specific rate stabilization mechanism, as prescribed herein. It is the intent of the Legislature to maintain as a reserve a specific portion of any actuarial surplus, and to use such reserve for the purpose of offsetting future unfunded liabilities caused by experience losses, thereby minimizing the risk of future increases in contribution rates. It is further the intent of the Legislature that the use of any excess above the reserve to offset retirement system normal costs shall be in a manner that will allow system employers to plan appropriately for resulting cost reductions and subsequent cost increases. The rate stabilization mechanism shall operate as follows:*
- 1. The actuarial surplus shall be the value of actuarial assets over actuarial liabilities, as is determined on the preceding June 30 or as may be estimated on the preceding December 31.*
 - 2. The full amount of any experience loss shall be offset, to the extent possible, by any actuarial surplus.*
 - 3. If the actuarial surplus exceeds 5 percent of actuarial liabilities, one-half of the excess may be used to offset total retirement system costs. In addition, if the actuarial surplus exceeds 10 percent of actuarial liabilities, an additional one-fourth of the excess above 10 percent may be used to offset total retirement system costs. In addition, if the actuarial surplus exceeds 15 percent of actuarial liabilities, an additional one-fourth of the excess above 15 percent may be used to offset total retirement system costs.*
 - 4. Any surplus amounts available to offset total retirement system costs pursuant to subparagraph 3. should be amortized each year over a 10-year rolling period on a level-dollar basis.*

We understand the RSM, enacted into Florida law in 2000, was the result of an involved lengthy study involving members of the Florida Legislature, FRS employers, legislative and executive branch policy staff, professionals from the Florida State Board of Administration (SBA) and the Division of Retirement, two independent actuarial firms and SBA Trustees. The group recommended that the Legislature consider a method to stabilize contribution rates and ease the burden of contribution volatility on FRS participating employers.

In fact, the Legislature included their philosophy in F.S., section 121.031(3)(f) as follows *It is the intent of the Legislature to maintain as a reserve a specific portion of any actuarial surplus, and to use such reserve for the purpose of offsetting future unfunded liabilities caused by experience losses, thereby minimizing the risk of future increases in contribution rates. It is further the intent of the Legislature that the use of any excess above the reserve to offset*

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retirement system normal costs shall be in a manner that will allow system employers to plan appropriately for resulting cost reductions and subsequent cost increases.

Further, we understand the previous reported surpluses (excess of the actuarial value of assets over the accrued actuarial liability) have arisen primarily due to favorable historic and recent investment returns and not from direct employer contributions.

In fact, as per the statute, a portion of prior surpluses has been used to stabilize contribution rates and fund System benefits.

The Actuarial Standards Board (ASB) promulgates standards of practice for actuaries. *Actuarial Standard of Practice (ASOP) No. 4 – Measuring Pension Obligations* addresses amortizations.

Paragraph 5.2.7 *Amortization—Factors Considered*— reads as follows:

Amortization may be required for such things as initial or unfunded actuarial liabilities, actuarial gains and losses and changes in actuarial liabilities due to plan amendments or changes in actuarial assumptions. The choice of an amortization period or range of periods should reflect:

- a. Any known limitations in the continuing ability of the plan sponsor to fund the plan. For example, consideration should be given to the probable future careers of the firm's principals for the plan of a small professional corporation, or the probable future lifetime of the plan sponsor;*
- b. The period over which the sponsor is benefited by the plan provision giving rise to the actuarial present value being amortized;*
- c. The existing relationship between assets and actuarial liabilities;*
- d. Progress towards meeting cash flow needs or a desired funding goal; and*
- e. Permissible smoothing of costs or contributions.*

The pattern of amortization during each selected period should be rational and systematic, such as a level annual dollar amount or a level percentage of participants' payroll.

The Government Accounting Standards Board (GASB) promulgates accounting standards for public entities. GASB Statements 25 and 27 generally set out expense and disclosure requirements for retirement systems.

Under GASB standards, expense should include provisions for amortizing the total unfunded actuarial liability (UAL), whether the UAL is positive or negative. Consequently, a negative unfunded accrued liability (surplus) is required to be amortized (See Guide to Implementation of GASB Statements 25, 26 and 27 on Pension Reporting and Disclosure by State and Local Government Plans and Employers - Question 40) and GASB Statement 27 (Footnote

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10).

In general, the maximum amortization period is 30 years for fiscal year ended June 30, 2009 (See Guide to Implementation of GASB Statements 25, 26 and 27 on Pension Reporting and Disclosure by State and Local Government Plans and Employers - Question 41) and GASB Statement 27 (Paragraph 10.f.1.).

Paragraph 148 of GASB Statement 25 reads *The Board also believes that, when components of the total unfunded actuarial liability are separately amortized, gains and losses of a similar type ... should be amortized over similar periods; that is it would not be appropriate to recognize all gains immediately or over very short periods and spread all losses over longer periods. The Board recognizes that a required minimum period may not always be appropriate. For example, in some circumstances, the immediate recognition of a gain to offset a loss may help to reduce volatility in the ARC.* Note that paragraph 148 is included in the *Basis for Conclusions* section rather than in the formal statement section. Consequently, it may represent GASB's preference, but not a formal requirement.

We are not aware of any additional GASB pronouncements that deal definitively with the amortization of surplus; however, we understand GASB has a consistent and clear preference for treating overfunded and underfunded liabilities in the same manner. Consequently, we believe it is likely that, if asked, GASB would reply that a maximum equivalent single amortization period of 30 years would indeed be applicable to any future FRS surpluses, and that the amortization of the unfunded accrued liability under the RSM is not presented and calculated in accordance with amortization periods allowed by GASB. If FRS wishes a more definitive determination of GASB's position on the maximum amortization period for surplus, we suggest that GASB be contacted directly.

The July 1, 2009 actuarial valuation report includes conforming GASB reporting. However, there is no guarantee that the RSM will produce compliant GASB contribution requirements in any year.

A **second issue** deals with the *policy* decision for treatment of the Deferred Retirement Option (DROP) program.

As stated on pages I-12 and I-13 of the July 1, 2009 Actuarial Valuation Report (Report) the DROP contribution requirement is determined on a two step approach. Based upon communication with the Department's actuary, we understand the process to proceed as follows:

Step 1 (1st bullet) - The liabilities are determined under the entry age normal actuarial cost method by Class utilizing assumed rates of future retirement that do not reflect the probability of entering the DROP. We understand current DROP members are treated as retired and included in their respective Class. The required contribution by Class is determined as the normal cost plus an unfunded accrued liability amortization cost (See Table IV - 7 of the Report).

Step 2 (2nd bullet) - The liabilities are re-determined under the entry age normal actuarial cost method utilizing assumed rates of future retirement that do reflect the probability of entering the

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DROP in the future. The required contribution for the DROP is determined as the increase in normal cost plus the increase in actuarial accrued liability amortized over 30 years as a level dollar amount assuming mid-year payment in the fiscal year following the Report year (See Table IV - 7 of the Report).

We understand for the remainder of the Report (excluding GASB accounting information) values are shown based upon Step 1 only.

For purposes of determining contribution amounts, the cost for the DROP may not have been determined under a GASB compliant actuarial cost method as defined under GASB Statement 27 (See Tables IV - 3 through 7 of the Report).

1. Tables IV – 7 of the July 1, 2009 Actuarial Valuation Report states that ... *DROP (contribution) rates are special charges to cover the assumed cost of DROP participant; they are not Normal Cost or UAL Cost in the traditional sense.*
2. Paragraph 10.a. of GASB Statement 27 states *Benefits to be included - The actuarial present value of total projected benefits should include all pension benefits to be provided by the plan to plan members or beneficiaries in accordance with (1) the terms of the plan and (2) any additional statutory or contractual agreement(s) to provide pension benefits through the plan that are in force at the actuarial valuation date.*
3. Paragraph 10.d. of GASB Statement 27 states *Actuarial cost method – One of the following actuarial cost methods should be used: entry-age, frozen entry age, attained age, projected unit credit, or the aggregate actuarial cost method as described in Paragraph 40, Section B.*

We believe all GASB accounting information has been presented based upon the STEP 2 results.

Finally, we note that the measurement of surplus (which does not exist this year) for purposes of the RSM is based upon the actuarial accrued liability measured under Step 1. This measurement currently understates the amount of unfunded accrued liability since the Step 1 actuarial accrued liability does not reflect the actuarial accrued liability for expected future DROPs. F.S., 121.031(3)(f)(1) uses the term actuarial liabilities without further definition. We might have expected the use of the full actuarial accrued liability measured inclusive of expectations of future DROPs (Step 2).

We note the retirement assumption in the first year has been increased as an estimate of members who would have retired rather than enter the DROP if there were no DROP. While this is a step in the right direction it does not capture the extent of expected future DROP enrollments.

The actuarial valuation shows that use of the actuarial accrued liability determined under the Step 2 approach would increase the reported July 1, 2009 unfunded accrued liability by \$2.172 billion.

- B. *The Department's actuaries use generally accepted actuarial cost methods, bases for assumptions and reporting standards.*

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For the most part, the actuarial valuation meets these requirements. As explained above (paragraph A), the use of the RSM is a somewhat nontraditional *actuarial cost method and the nontraditional treatment of DROPs understates plan liabilities*. Our discussion of certain aspects of the actuarial cost methods are included in paragraph A above.

A number of actuarial assumptions were updated and first implemented for this July 1, 2009 Actuarial Valuation based upon the Experience Study covering the five-year period ended June 30, 2008. We believe that the updated assumptions generally better reflect prior experience and future expectations. While not unreasonable, the inactive healthy mortality rates appear conservative.

Please see our review of the Experience Study covering the five-year period ended June 30, 2008 for more detailed information.

Process for Assumption Setting: The principles set forth in Actuarial Standards of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* guide the proper selection of **economic assumptions**. In particular, they proscribe that the actuary develop a best estimate range for each economic assumption, and then recommend a specific point within that range. After completing the assumption process, the actuary should review the set of economic assumptions for consistency.

The principles set forth in ASOP No. 35, *Selection of Demographic and Other Noneconomic Actuarial Assumptions* for Measuring Pension Obligations guide the proper selection of the remaining actuarial assumptions. In particular, they proscribe the actuary to use professional judgment to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgment. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the System that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

The following comments on the remaining actuarial assumptions remain valid.

1. **Early retirement / withdrawal rates** – Early retirement and withdrawal rates are combined due to the somewhat unusual early retirement eligibility under the System (completion of six years of service regardless of age). The valuation assumes early retirement (immediate reduced benefit commencement) for vested members leaving employment within ten (10) years of normal retirement. All other vested terminations are assumed to elect an unreduced deferred benefit commencing at normal retirement date.

These rates reflect ten (10) year select and ultimate rates. It may be more common to use a select period that coincides with the vesting period (6 years vs. 10 years). Also, we are unaware of any analysis to determine experience relating to members electing immediate reduced benefits vs. deferring unreduced benefits to normal retirement date.

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2. ***Retirement rates and DROP*** – We have discussed in detail issues relating to the treatment of current and future DROPs (see Paragraph A).

In brief, two sets of retirement rates are determined. Set one does not reflect the probability of entering the DROP. Set 2 reflects the probability of entering the DROP. The Actuarial Valuation Report is substantially based upon Set 1 retirement rates, which include an assumption that half of the members expected to enter the DROP would still elect to retire in the absence of the DROP.

As stated above, we believe the Report should substantially reflect Set 2 retirement rates. The allocation of the contribution to Classes could be included in the Report based upon Step 1 rates consistent with our understanding of policy decisions.

3. ***Inactive mortality and disabled mortality rates*** - The inactive mortality rates (separate male and female rates) used for all Classes were updated to reflect experience (lower than expected observed mortality). While not unreasonable, the inactive healthy mortality rates appear conservative.

Please refer to our actuarial review of the Experience Study covering the five-year period ended June 30, 2008 for a more detailed analysis.

- C. *The specific economic and demographic assumptions used are arrived at from a sufficient level of detail considered, and are reasonable in light of recent experience. Such analysis should also comment on the collective effect of all assumptions.*

Except for the economic assumptions referred to in Paragraph B, the actuarial assumptions were for the most part examined in the recently completed Experience Study.

In Paragraph B (above) we have provided our insights regarding the economic and demographic assumptions in light of the Experience Study.

The accounting expense and disclosure assumptions appear to have been derived using approximately a 4% increasing payroll assumption for purposes of amortization of the surplus.

In addition, the 4% assumption should be based upon reasonable expectations. FRS experience for the most recent three (3) years disclosed on page E-1 as follows:

Fiscal Ended	Payroll Growth
June 30, 2007	4.23%
June 30, 2008	2.00%
June 30, 2009	-1.63%

F.S., 112.64(5)(a) provides - *If the amortization schedule for unfunded liability is to be based on a*

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contribution derived in whole or in part from a percentage of the payroll of the system or plan membership, the assumption as to payroll growth shall not exceed the average payroll growth for the 10 years prior to the latest actuarial valuation of the system or plan unless a transfer, merger, or consolidation of government functions or services occurs, in which case the assumptions for payroll growth may be adjusted and may be based on the membership of the retirement plan or system subsequent to such transfer, merger, or consolidation.

The net effect of the changes in demographic assumptions resulting from the Experience Study was to make the collective actuarial basis more conservative. This was born out by the \$5.854 billion increase in the actuarial accrued liability sourced from the changes in actuarial assumptions shown in the July 1, 2009 Actuarial Valuation Report.

- D. *The Departments actuaries provide sufficient information as to causes for gains, losses, and net change in the unfunded liability to allow evaluation of specific factors.*

The July 1, 2009 Actuarial Valuation Report provides information on actuarial gains and losses and net change in unfunded liability on several different pages.

The Executive Summary of the Report breaks out gains and losses by source for the actuarial accrued liability. Gains and losses by source are first determined based upon the total actuarial accrued liability (exclusive of gains and losses from assumed investment return) followed by the effect on the unfunded actuarial accrued liability showing the loss from investment return.

The System experienced an actuarial **loss of \$18.370 billion** during fiscal year ended June 30, 2009 - \$11.956 billion loss from investments / \$0.334 billion gain from liabilities. This amount is not explicitly shown in the Executive Summary, as the amount shown in the Executive Summary includes the impact of the assumption changes. We believe this is a key result which should be readily available to reader of this actuarial valuation report. In addition, this loss is impacted by the nontraditional treatment of liabilities for the DROP.

As we also noted last year, we note that Chapter 60T-1, Florida Administrative Code establishes requirements for Actuarial Reports for Florida *local law* public employee retirement systems. F.A.C., Chapter 60T-1.001(2) provides **Scope and Purpose**... *The objectives of this chapter are to enhance and further clarify the intent of Part VII, Chapter 112, Florida Statutes, so that governmental retirement systems may be managed, administered, operated, and funded in such manner as to maximize the protection of public employee retirement benefits. Inherent in this intent is the recognition that the pension liabilities attributable to the benefits promised public employees be fairly, orderly, and equitably funded by the current, as well as future, taxpayers.*

F.A.C., Chapter 60T-1.003(4)(h) provides **Actuarial Reports**... *Disclosure, for each plan year, of the derivation of the current unfunded actuarial accrued liability from the amount established as of the immediately preceding valuation date. (Unfunded actuarial accrued liabilities are amortized by nonemployee contributions in excess of normal cost and interest requirements.) The disclosure shall, minimally, include the following:*

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1. Total unfunded actuarial accrued liability for the immediately prior actuarial valuation date (state date)		\$ _____
2. Plan sponsor normal cost for this plan year		\$ _____
3. Interest accrued on 1. and 2.		\$ _____
4. Plan sponsor contributions for this plan year (including amounts expected to be paid)		\$ _____
5. Interest on 4.		\$ _____
6. Changes due to a. + b. + c. + d.		
a. assumptions	\$ _____	
b. funding method	\$ _____	
c. plan amendments	\$ _____	
d. actuarial gain/loss	\$ _____	
7. Total current unfunded actuarial accrued liability = 1. + 2. + 3. - 4. - 5. + 6.		\$ _____

If this information must be provided by all local law public retirement systems in Florida, it seems reasonable and appropriate for it to be included in the FRS Actuarial Valuation Report. We believe this information adds value for the reader and imposes a discipline on the Report preparer.

In addition, we believe it may be more appropriate to determine actuarial gains and losses fully recognizing the probability of future DROPs and traditional treatment of current DROPs. This is the Step 2 approach described above and the required approach for GASB reporting.

We believe the Step 1 approach may only be appropriate for contribution allocation.

Liability actuarial (gains) / losses are reported by source on page I-6 of the Report. We note that the most significant source of liability actuarial (gain) / loss identified this year is a \$1.968 billion gain due to *Salary Increases less than expected*. Last year there was an actuarial gain of \$0.395 billion due to *Salary Increases less than expected*.

We also note a substantial loss of \$1.533 billion due to Inactive Data Clean-Up. During the previous two years, a major source of actuarial (gain) / loss identified were losses due to *inactive data clean-up* of \$1.369 billion and \$1.172 billion, respectively. We understand a major part of this liability is a result of the valuation actuary's overstatement of mortality gains for the death of retired members who have elected joint and survivor benefits. We understand these overstated mortality gains are offset by losses included as part of the inactive data clean-up. We believe effort is warranted to maintain accurate data to ensure the validity of reported actuarial results.

E. *The Departments actuaries' actuarial report adequately provides necessary information that another actuary, unfamiliar with the situation, would find sufficient to appraise the findings and arrive at reasonably similar results.*

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The Actuarial Valuation Report provides significant information - both in terms of importance and in volume. The FRS is complicated and the valuation methods employed are somewhat non-traditional for: (1) certain benefits (DROP), (2) the allocation of contribution requirement by Class and (3) the use of the Rate Stabilization Mechanism.

In addition to our comments in the above paragraphs, we believe that additional information would be both helpful and appropriate. We are pleased to see the actuarial present value of future benefits and the actuarial present value of future pay disclosed this year. We note, however, these disclosures do not reflect the Step 2 assumptions for future DROPs.

As detailed later in our Review, we requested and were provided with these actuarial present values by Class were requested and provided further broken down by decrement. This detail was provided both under the retirement assumptions that do not recognize future DROPs (Step 1 retirement assumptions) and fully recognizing future DROPs (Step 2). This is the basis for our validation of the results of the actuarial valuation.

We believe the actuarial valuation report could be further improved by providing additional prior year results along with side-by-side current year results as appropriate. The reader of the actuarial valuation report would gain insight from a ready comparison both in terms of changes in absolute value and percentage changes.

We may again look to Chapter 60T-1, Florida Administrative Code which endorses the prior year / current year side by side comparison along with suggestions of key valuation disclosures.

F.A.C., Chapter 60T-1.003(4)(h) provides *Actuarial Reports... (l) A comparative summary of principal valuation results, essentially in the following format:*

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS
(Not a required format – to be used as a guide only)

	<i>Actuarial Valuation Prepared as of</i>	
	<i>Current Date</i>	<i>Prior Date</i>
<i>1. Participant Data</i>		
<i>Active members</i>	# _____	# _____
<i>Total annual payroll</i>	\$ _____	\$ _____
<i>Retired members and beneficiaries (other than disabled)</i>		
<i>Total annualized benefit</i>	\$ _____	\$ _____
<i>Disabled members receiving benefits</i>	# _____	# _____
<i>Total annualized benefit</i>	\$ _____	\$ _____
<i>Terminated vested members</i>	# _____	# _____
<i>Total annualized benefit</i>	\$ _____	\$ _____
<i>2. Assets</i>		
<i>Actuarial value of assets</i>	\$ _____	\$ _____

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Market value of assets	\$ _____	\$ _____
3. Liabilities		
Present value of all future expected benefit payments:		
Active members	\$ _____	\$ _____
Retirement benefits	\$ _____	\$ _____
Vesting benefits	\$ _____	\$ _____
Disability benefits	\$ _____	\$ _____
Death benefits	\$ _____	\$ _____
Return of contribution	\$ _____	\$ _____
Total	\$ _____	\$ _____
Terminated vested members	\$ _____	\$ _____
Retired members and beneficiaries:		
Retired (other than disabled) and beneficiaries	\$ _____	\$ _____
Disabled members	\$ _____	\$ _____
Total	\$ _____	\$ _____
Total present value of all future expected benefit payments	\$ _____	\$ _____
Liabilities due and unpaid	\$ _____	\$ _____
*Actuarial accrued liability	\$ _____	\$ _____
*Unfunded actuarial accrued liability	\$ _____	\$ _____
*Refers to liabilities not funded by future normal cost contributions. Show amount, date and amortization period a establishment, and current amount of each such liability not amortized		
4. Actuarial present value of accrued benefits (to be determined in accordance with a. and b. below)		
Statement of actuarial present value of all accrued benefits		
Vested accrued benefits	\$ _____	\$ _____
Inactive members and beneficiaries	\$ _____	\$ _____
Active members (includes nonforfeitable accumulated member contributions in the amount of)	\$ _____	\$ _____
Total value of all vested accrued benefits	\$ _____	\$ _____
Non-vested accrued benefits	\$ _____	\$ _____
Total actuarial present value of all accrued benefits	\$ _____	\$ _____
Statement of changes in total actuarial present value of all accrued benefits		
Actuarial present value of accrued benefits at _____		

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beginning of year	\$ _____
Increase (decrease) during year attributable to (where applicable):	
Plan amendment	\$ _____
Changes in actuarial assumptions	\$ _____
Increase for interest and probability of payment due to decrease in discount period and benefits accrued	\$ _____
Benefits paid	\$ _____
Other changes (identify and state amount)	\$ _____
Net increase (decrease)	\$ _____
Actuarial present value of accrued benefits at end of year	\$ _____

a. Accrued benefits are those future promised benefits that are determined in accordance with the plan's provisions based on the service members have rendered to the actuarial valuation date. Accrued benefits are those payable under all applicable plan circumstances – retirement, death, disability, and termination of employment – to the extent they are deemed attributable to member service rendered to the valuation date. Benefits to be provided by insured contracts for which the plan sponsor has no future liability and which are excluded from plan assets are to be excluded from plan benefits.

b. All determinations are to be on a consistent basis. Any change is to be disclosed, together with an explanation. The exhibit entries for the actuarial valuation date as of which a change is made shall show the entries on a before and after change basis.

5. Pension cost (specify applicable funding period)

Normal cost (show cost for each benefit if so calculated and amount of administrative expenses, if applicable.)

	\$ _____	\$ _____
Payment to amortize unfunded liability	\$ _____	\$ _____
Expected plan sponsor contribution (including normal cost, amortization payment and interest, as applicable)	\$ _____	\$ _____
As % of payroll	_____ %	_____ %
Amount to be contributed by members	\$ _____	\$ _____
As % of payroll	_____ %	_____ %

6. Past contributions

For each plan year since last report:

Required plan sponsor contribution	\$ _____	\$ _____
Required member contribution	\$ _____	\$ _____
Actual contributions made by:		
Plan's sponsor	\$ _____	\$ _____
Members	\$ _____	\$ _____
Other (e.g., Chapters 175 or 185, F.S.)	\$ _____	\$ _____
7. Net actuarial gain (loss) (if applicable)	\$ _____	\$ _____

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8. <i>Other disclosures (where applicable)</i>		
<i>Present value of active member:</i>		
<i>Future salaries</i>		
<i>at attained age</i>	\$ _____	\$ _____
<i>at entry age</i>	\$ _____	\$ _____
<i>Future contributions</i>		
<i>at attained age</i>	\$ _____	\$ _____
<i>at entry age</i>	\$ _____	\$ _____
<i>Present value of future contributions from other sources (identify)</i>	\$ _____	\$ _____
<i>Present value of future expected benefit payments for active members at entry age</i>	\$ _____	\$ _____

F. *Other aspects of the Department's actuaries' work and report are sufficient*

As stated above, the Actuarial Valuation Report provides significant information. We believe that disclosures of the normal costs and actuarial liabilities fully reflecting the DROP are appropriate.

F.S. 121.031(3)(a) provides *The valuation of plan assets shall be based on a 5-year averaging methodology such as that specified in the United States Department of Treasury Regulations, 26 C.F.R. s. 1.412(c)(2)-1, or a similar accepted approach designed to attenuate fluctuations in asset values.*

The July 1, 2009 actuarial value of assets method starts with the July 1, 2008 actuarial value of assets and determines an expected actuarial value of assets as of July 1, 2009 assuming the expected fund return (7.75% for fiscal 2009) recognizing non-investment cash flows. The July 1, 2009 actuarial value of assets is the July 1, 2009 expected actuarial value plus 20% of the excess (deficiency) of July 1, 2009 market value of assets over the July 1, 2009 expected value of assets.

We believe this actuarial value of assets method is an acceptable method under Treasury regulations and complies with Florida statute. However, we note that under prior IRS rules, if a private retirement plan covered by the above Treasury regulation were to switch from another approved method to this method, the private retirement plan would require prior IRS approval. This is not the case with pre-approved methods. We believe that a method subject to automatic approval may be preferable.

A deficiency of the current actuarial value of assets method is that if actual investment returns exactly matched expected investment returns over the 5-year averaging period, the actuarial value under this method would NOT equal the market value.

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Replication of July 1, 2009

Actuarial Valuation Results

Gabriel Roeder Smith & Company

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IV. Replication of key financial results of the July 1, 2009 Actuarial Valuation

In this phase of the review, GRS reviewed the calculated values (present value of benefits) supplied by the Department's actuaries subdivided by Class and type of benefit for active members (i.e., service retirement, vesting and reduced retirement, ordinary and service disability, ordinary and service death, and refunds of contributions) and pensioners by category (retirees, terminated vesteds and current DROPS) divided by Class. In addition, we reviewed the calculation of the present values of future salaries divided by Class.

The following tables compare the results of the System actuaries and GRS calculations of present value of benefits and future compensation for each Class under regular retirement rates and increased retirement rates that reflect anticipated future DROPS.

GRS established quantitative measures to determine whether, on a present value line by line basis (i.e., retired members, beneficiaries, active retirement, death, disability, etc.), results calculated separately by GRS and the System actuaries agreed with each other to within reasonable tolerances. One of our quantitative tests is the ratio of the line present value calculated by GRS to the line present value calculated by the System actuaries. To PASS this test requires a difference not in excess of 5.0%. This test is sensitive to the size of the line present value that is measured in thousand dollar increments. For example, the present value for non-duty disability for active Special Risk Administrative (No Future DROP Retirement Rates) (SRA) Class members is 258. A GRS calculation of above 270 or below 246 would fail this 5.0% test. In fact, GRS calculated 273, which is only off by fifteen (15) but fails the percentage test (5.81%).

Measure Two of our quantitative test is the ratio of the difference between the line present value calculation of the System actuaries and the GRS line present value calculation divided by the total liability calculated by the System actuaries. To PASS this test requires a ratio within 0.5%. The present value for non-duty disability for active Special Risk Administrative (No Future DROP Retirement Rates) (SRA) Class members mentioned above clearly passes this test (0.02%) as expected due to the minimal dollar difference. A PASS is assigned to each line present value only if Measure One or Measure Two is passed.

Every line liability PASSES for all Classes and for both retirement rate assumption sets and in our opinion our results have verified the calculations of the Department's actuaries. Our results should not replace the results of the System actuaries. Our calculations are sufficient only for the purpose intended (actuarial review) and are not suitable for any other purpose.

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<u>FLORIDA RETIREMENT SYSTEM</u>			GRAND TOTAL -- No Future DROPs Retirement Rates				
(\$ 000)			Liability Ratio		Liability Test		
<u>Active PVFB</u>	<u>Milliman</u>	<u>GRS</u>	<u>Individual</u>	<u>Total</u>	<u>5%</u>	<u>PVFB 0.5%</u>	<u>Composite</u>
Withdrawal / Early Retirement	\$ 11,802,678	\$ 11,601,201	(0.0171)	(0.0012)	Pass	Pass	Pass
Retirement	73,288,968	74,992,008	0.0232	0.0104	Pass	Fail	Pass
Non-Duty Death	1,515,134	1,621,706	0.0703	0.0007	Fail	Pass	Pass
Duty Death	581,251	656,770	0.1299	0.0005	Fail	Pass	Pass
Non-Duty Disability	2,082,213	2,218,924	0.0657	0.0008	Fail	Pass	Pass
Duty Disability	649,660	694,985	0.0698	0.0003	Fail	Pass	Pass
Return of Contributions	128	232	0.8122	0.0000	Fail	Pass	Pass
Subtotal	\$ 89,920,032	\$ 91,785,826	0.0207	0.0114	Pass	N/A	Pass
Less PVF Contributions	2,831	2,831	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 89,917,201	\$ 91,782,995	0.0208	0.0114	Pass	N/A	Pass
Count	572,591	572,591	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 239,550,068	\$ 247,531,398	0.0333	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 55,054,800	\$ 56,276,925	0.0222	0.0075	Pass	Fail	Pass
Terminated Vesteds	4,381,108	4,408,955	0.0064	0.0002	Pass	Pass	Pass
DROPs	14,344,323	14,527,472	0.0128	0.0011	Pass	Pass	Pass
Total Inactive	\$ 73,780,231	\$ 75,213,352	0.0194	0.0088	Pass	N/A	Pass
Total	\$ 163,697,432	\$ 166,996,347	0.0202	0.0202	Pass	N/A	Pass

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<u>FLORIDA RETIREMENT SYSTEM</u>			Special Risk Admin (SRA) -- No Future DROPs Retirement Rates				
(\$ 000)			Liability Ratio		Liability Test		
<u>Active PVFB</u>	<u>Milliman</u>	<u>GRS</u>	<u>Individual</u>	<u>Total</u>	<u>5%</u>	<u>PVFB 0.5%</u>	<u>Composite</u>
Withdrawal / Early Retirement	\$ 2,567	\$ 2,841	0.1067	0.0030	Fail	Pass	Pass
Retirement	12,257	12,266	0.0007	0.0001	Pass	Pass	Pass
Non-Duty Death	166	139	(0.1627)	(0.0003)	Fail	Pass	Pass
Duty Death	93	99	0.0645	0.0001	Fail	Pass	Pass
Non-Duty Disability	258	273	0.0581	0.0002	Fail	Pass	Pass
Duty Disability	223	241	0.0807	0.0002	Fail	Pass	Pass
Return of Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Subtotal	\$ 15,564	\$ 15,859	0.0190	0.0032	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 15,564	\$ 15,859	0.0190	0.0032	Pass	N/A	Pass
Count	59	59	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 20,587	\$ 21,217	0.0306	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 70,817	\$ 72,301	0.0210	0.0162	Pass	Fail	Pass
Terminated Vesteds	1,556	1,567	0.0071	0.0001	Pass	Pass	Pass
DROPs	3,591	3,624	0.0092	0.0004	Pass	Pass	Pass
Total Inactive	\$ 75,964	\$ 77,492	0.0201	0.0167	Pass	N/A	Pass
Total	\$ 91,528	\$ 93,351	0.0199	0.0199	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

FLORIDA RETIREMENT SYSTEM

Special Risk (SR) - - No Future DROPs Retirement Rates

(\$ 000)

	Milliman	GRS	Liability Ratio		Liability Test		
			Individual	Total	Individual	PVFB	Composite
			5%	0.5%			
<u>Active PVFB</u>							
Withdrawal / Early Retirement	\$ 1,911,622	\$ 1,885,928	(0.0134)	(0.0007)	Pass	Pass	Pass
Retirement	19,082,229	19,467,418	0.0202	0.0108	Pass	Fail	Pass
Non-Duty Death	407,492	505,821	0.2413	0.0028	Fail	Pass	Pass
Duty Death	215,933	261,075	0.2091	0.0013	Fail	Pass	Pass
Non-Duty Disability	584,707	614,422	0.0508	0.0008	Fail	Pass	Pass
Duty Disability	483,526	514,543	0.0641	0.0009	Fail	Pass	Pass
Return of Contributions	62	63	0.0161	0.0000	Pass	Pass	Pass
Subtotal	\$ 22,685,571	\$ 23,249,270	0.0248	0.0159	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$22,685,571	\$23,249,270	0.0248	0.0159	Pass	N/A	Pass
Count	65,606	65,606	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 46,218,476	\$ 47,159,540	0.0204	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 9,715,621	\$ 9,929,418	0.0220	0.0060	Pass	Fail	Pass
Terminated Vesteds	578,519	582,291	0.0065	0.0001	Pass	Pass	Pass
DROPs	2,536,403	2,568,957	0.0128	0.0009	Pass	Pass	Pass
Total Inactive	\$ 12,830,543	\$ 13,080,666	0.0195	0.0070	Pass	N/A	Pass
Total	\$35,516,114	\$36,329,936	0.0229	0.0229	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

FLORIDA RETIREMENT SYSTEM

Senior Management (SM) - - No Future DROPs Retirement Rates

(\$ 000)

	Milliman	GRS	Liability Ratio		Liability Test		
			Individual	Total	Individual	PVFB	Composite
			5%	0.5%			
<u>Active PVFB</u>							
Withdrawal / Early Retirement	\$ 232,727	\$ 228,626	(0.0176)	(0.0010)	Pass	Pass	Pass
Retirement	1,950,723	1,958,901	0.0042	0.0020	Pass	Pass	Pass
Non-Duty Death	31,448	32,533	0.0345	0.0003	Pass	Pass	Pass
Duty Death	9,263	10,152	0.0960	0.0002	Fail	Pass	Pass
Non-Duty Disability	28,329	30,443	0.0746	0.0005	Fail	Pass	Pass
Duty Disability	4,343	4,743	0.0921	0.0001	Fail	Pass	Pass
Return of Contributions	22	22	0.0000	0.0000	Pass	Pass	Pass
Subtotal	\$ 2,256,855	\$ 2,265,420	0.0038	0.0021	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$2,256,855	\$2,265,420	0.0038	0.0021	Pass	N/A	Pass
Count	5,779	5,779	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 3,957,820	\$ 4,129,500	0.0434	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 1,121,920	\$ 1,140,236	0.0163	0.0046	Pass	Pass	Pass
Terminated Vesteds	144,636	145,548	0.0063	0.0002	Pass	Pass	Pass
DROPs	494,234	500,912	0.0135	0.0017	Pass	Pass	Pass
Total Inactive	\$1,760,790	\$1,786,696	0.0147	0.0064	Pass	N/A	Pass
Total	\$4,017,645	\$4,052,116	0.0086	0.0086	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

FLORIDA RETIREMENT SYSTEM Regular (REG) + TRS + SCOERS + IFAS -- No Future DROPs Retirement Rates
(\$ 000)

	Milliman	GRS	Liability Ratio		Liability Test		
			Individual	Total	Individual 5%	PVFB 0.5%	Composite
Active PVFB							
Withdrawal / Early Retirement	\$ 9,570,672	\$ 9,400,917	(0.0177)	(0.0014)	Pass	Pass	Pass
Retirement	51,505,762	52,811,024	0.0253	0.0107	Pass	Fail	Pass
Non-Duty Death	1,050,521	1,052,795	0.0022	0.0000	Pass	Pass	Pass
Duty Death	350,609	380,228	0.0845	0.0002	Fail	Pass	Pass
Non-Duty Disability	1,453,237	1,557,408	0.0717	0.0009	Fail	Pass	Pass
Duty Disability	158,973	172,713	0.0864	0.0001	Fail	Pass	Pass
Return of Contributions	40	139	2.4750	0.0000	Fail	Pass	Pass
Subtotal	\$ 64,089,814	\$ 65,375,224	0.0201	0.0105	Pass	N/A	Pass
Less PVF Contributions	2,831	2,831	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 64,086,983	\$ 65,372,393	0.0201	0.0105	Pass	N/A	Pass
Count	499,304	499,304	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 187,916,114	\$ 194,756,197	0.0364	N/A	Pass	N/A	Pass
Inactive PVFB							
Retirees	\$ 43,196,551	\$ 44,170,814	0.0226	0.0080	Pass	Fail	Pass
Terminated Vesteds	3,598,926	3,621,727	0.0063	0.0002	Pass	Pass	Pass
DROPs	11,009,358	11,149,016	0.0127	0.0011	Pass	Pass	Pass
Total Inactive	\$ 57,804,835	\$ 58,941,557	0.0197	0.0093	Pass	N/A	Pass
Total	\$ 121,891,818	\$ 124,313,950	0.0199	0.0199	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

FLORIDA RETIREMENT SYSTEM Judicial (J) -- No Future DROPs Retirement Rates
(\$ 000)

	Milliman	GRS	Liability Ratio		Liability Test		
			Individual	Total	Individual 5%	PVFB 0.5%	Composite
Active PVFB							
Withdrawal / Early Retirement	\$ 44,791	\$ 43,837	(0.0213)	(0.0007)	Pass	Pass	Pass
Retirement	552,615	556,294	0.0067	0.0027	Pass	Pass	Pass
Non-Duty Death	19,490	23,397	0.2005	0.0028	Fail	Pass	Pass
Duty Death	4,003	3,850	(0.0382)	(0.0001)	Pass	Pass	Pass
Non-Duty Disability	12,173	12,644	0.0387	0.0003	Pass	Pass	Pass
Duty Disability	1,994	2,094	0.0502	0.0001	Fail	Pass	Pass
Return of Contributions	0	3	299.0000	0.0000	Fail	Pass	Pass
Subtotal	\$ 635,066	\$ 642,119	0.0111	0.0051	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 635,066	\$ 642,119	0.0111	0.0051	Pass	N/A	Pass
Count	798	798	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 1,051,143	\$ 1,065,816	0.0140	N/A	Pass	N/A	Pass
Inactive PVFB							
Retirees	\$ 522,163	\$ 528,503	0.0121	0.0046	Pass	Pass	Pass
Terminated Vesteds	17,383	17,494	0.0064	0.0001	Pass	Pass	Pass
DROPs	204,896	207,746	0.0139	0.0021	Pass	Pass	Pass
Total Inactive	\$ 744,442	\$ 753,743	0.0125	0.0067	Pass	N/A	Pass
Total	\$1,379,508	\$1,395,862	0.0119	0.0119	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		Legislative - Attorney - Cabinet (ESO) -- No Future DROPs Retirement Rates					
(S 000)				Liability Ratio		Liability Test	
<u>Active PVFB</u>	<u>Milliman</u>	<u>GRS</u>	<u>Individual</u>	<u>Total</u>	<u>5%</u>	<u>PVFB 0.5%</u>	<u>Composite</u>
Withdrawal / Early Retirement	\$ 7,636	\$ 7,370	(0.0348)	(0.0022)	Pass	Pass	Pass
Retirement	17,943	18,032	0.0050	0.0007	Pass	Pass	Pass
Non-Duty Death	721	853	0.1831	0.0011	Fail	Pass	Pass
Duty Death	173	176	0.0173	0.0000	Pass	Pass	Pass
Non-Duty Disability	446	472	0.0583	0.0002	Fail	Pass	Pass
Duty Disability	82	88	0.0732	0.0000	Fail	Pass	Pass
Return of Contributions	0	1	99.0000	0.0000	Fail	Pass	Pass
Subtotal	\$ 27,001	\$ 26,992	(0.0003)	(0.0001)	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 27,001	\$ 26,992	(0.0003)	(0.0001)	Pass	N/A	Pass
Count	120	120	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 45,523	\$ 47,236	0.0376	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 60,126	\$ 60,850	0.0120	0.0060	Pass	Fail	Pass
Terminated Vesteds	10,049	10,107	0.0058	0.0005	Pass	Pass	Pass
DROPs	23,671	24,033	0.0153	0.0030	Pass	Pass	Pass
Total Inactive	\$ 93,846	\$ 94,990	0.0122	0.0095	Pass	N/A	Pass
Total	\$ 120,847	\$ 121,982	0.0094	0.0094	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		Elected County Officials (ECO) -- No Future DROPs Retirement Rates					
(S 000)				Liability Ratio		Liability Test	
<u>Active PVFB</u>	<u>Milliman</u>	<u>GRS</u>	<u>Individual</u>	<u>Total</u>	<u>5%</u>	<u>PVFB 0.5%</u>	<u>Composite</u>
Withdrawal / Early Retirement	\$ 32,663	\$ 31,682	(0.0300)	(0.0014)	Pass	Pass	Pass
Retirement	167,439	168,073	0.0038	0.0009	Pass	Pass	Pass
Non-Duty Death	5,296	6,168	0.1647	0.0013	Fail	Pass	Pass
Duty Death	1,177	1,190	0.0110	0.0000	Pass	Pass	Pass
Non-Duty Disability	3,063	3,262	0.0650	0.0003	Fail	Pass	Pass
Duty Disability	519	563	0.0848	0.0001	Fail	Pass	Pass
Return of Contributions	4	4	0.0000	0.0000	Pass	Pass	Pass
Subtotal	\$ 210,161	\$ 210,942	0.0037	0.0011	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 210,161	\$ 210,942	0.0037	0.0011	Pass	N/A	Pass
Count	925	925	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 340,405	\$ 351,892	0.0337	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 367,602	\$ 374,803	0.0196	0.0106	Pass	Fail	Pass
Terminated Vesteds	30,039	30,221	0.0061	0.0003	Pass	Pass	Pass
DROPs	72,170	73,184	0.0141	0.0015	Pass	Pass	Pass
Total Inactive	\$ 469,811	\$ 478,208	0.0179	0.0123	Pass	N/A	Pass
Total	\$ 679,972	\$ 689,150	0.0135	0.0135	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		GRAND TOTAL -- Future DROPs Retirement Rates						
(\$ 000)						Liability Test		
<u>Active PVFB</u>	Milliman	GRS	Liability Ratio		Individual	PVFB	Composite	
			Individual	Total	5%	0.5%		
Withdrawal / Early Retirement	\$ 11,802,678	\$ 11,601,200	(0.0171)	(0.0012)	Pass	Pass	Pass	
Retirement	75,362,856	77,007,360	0.0218	0.0099	Pass	Fail	Pass	
Non-Duty Death	1,313,509	1,384,495	0.0540	0.0004	Fail	Pass	Pass	
Duty Death	534,658	604,540	0.1307	0.0004	Fail	Pass	Pass	
Non-Duty Disability	1,924,468	2,058,803	0.0698	0.0008	Fail	Pass	Pass	
Duty Disability	597,422	640,372	0.0719	0.0003	Fail	Pass	Pass	
Return of Contributions	128	217	0.6950	0.0000	Fail	Pass	Pass	
Subtotal	\$ 91,535,719	\$ 93,297,187	0.0192	0.0107	Pass	N/A	Pass	
Less PVF Contributions	2,831	2,831	0.0000	0.0000	Pass	Pass	Pass	
Total Active PVFB	\$ 91,532,888	\$ 93,294,356	0.0192	0.0107	Pass	N/A	Pass	
Count	572,591	572,591	0.0000	N/A	Pass	N/A	Pass	
Active PVF Salary:	\$ 225,848,513	\$ 235,064,682	0.0362	N/A	Pass	N/A	Pass	
<u>Inactive PVFB</u>								
Retirees	\$ 55,054,800	\$ 56,276,925	0.0222	0.0074	Pass	Fail	Pass	
Terminated Vesteds	4,381,108	4,408,955	0.0064	0.0002	Pass	Pass	Pass	
DROPs	14,344,323	14,527,472	0.0128	0.0011	Pass	Pass	Pass	
Total Inactive	\$ 73,780,231	\$ 75,213,352	0.0194	0.0087	Pass	N/A	Pass	
Total	\$ 165,313,119	\$ 168,507,708	0.0193	0.0193	Pass	N/A	Pass	

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Gabriel Roeder Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		Special Risk Admin (SRA) -- Future DROPs Retirement Rates						
(\$ 000)						Liability Test		
<u>Active PVFB</u>	Milliman	GRS	Liability Ratio		Individual	PVFB	Composite	
			Individual	Total	5%	0.5%		
Withdrawal / Early Retirement	\$ 2,567	\$ 2,841	0.1067	0.0030	Fail	Pass	Pass	
Retirement	12,449	12,456	0.0006	0.0001	Pass	Pass	Pass	
Non-Duty Death	151	125	(0.1722)	(0.0003)	Fail	Pass	Pass	
Duty Death	86	93	0.0814	0.0001	Fail	Pass	Pass	
Non-Duty Disability	238	253	0.0630	0.0002	Fail	Pass	Pass	
Duty Disability	206	222	0.0777	0.0002	Fail	Pass	Pass	
Return of Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass	
Subtotal	\$ 15,697	\$ 15,990	0.0187	0.0032	Pass	N/A	Pass	
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass	
Total Active PVFB	\$ 15,697	\$ 15,990	0.0187	0.0032	Pass	N/A	Pass	
Count	59	59	0.0000	N/A	Pass	N/A	Pass	
Active PVF Salary:	\$ 19,326	\$ 19,997	0.0347	N/A	Pass	N/A	Pass	
<u>Inactive PVFB</u>								
Retirees	\$ 70,817	\$ 72,301	0.0210	0.0162	Pass	Fail	Pass	
Terminated Vesteds	1,556	1,567	0.0071	0.0001	Pass	Pass	Pass	
DROPs	3,591	3,624	0.0092	0.0004	Pass	Pass	Pass	
Total Inactive	\$ 75,964	\$ 77,492	0.0201	0.0167	Pass	N/A	Pass	
Total	\$ 91,661	\$ 93,482	0.0199	0.0199	Pass	N/A	Pass	

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Gabriel Roeder Smith & Company

FLORIDA RETIREMENT SYSTEM

(\$ 000)

Special Risk (SR) - - Future DROPs Retirement Rates

	<u>Milliman</u>	<u>GRS</u>	<u>Liability Ratio</u>		<u>Liability Test</u>		
			<u>Individual</u>	<u>Total</u>	<u>Individual</u>	<u>PVFB</u>	<u>Composite</u>
			<u>5%</u>	<u>0.5%</u>			
<u>Active PVFB</u>							
Withdrawal / Early Retirement	\$ 1,911,622	\$ 1,885,928	(0.0134)	(0.0007)	Pass	Pass	Pass
Retirement	19,672,046	20,040,597	0.0187	0.0102	Pass	Fail	Pass
Non-Duty Death	367,672	452,684	0.2312	0.0024	Fail	Pass	Pass
Duty Death	202,157	242,838	0.2012	0.0011	Fail	Pass	Pass
Non-Duty Disability	543,464	572,122	0.0527	0.0008	Fail	Pass	Pass
Duty Disability	446,150	475,233	0.0652	0.0008	Fail	Pass	Pass
Return of Contributions	62	62	0.0000	0.0000	Pass	Pass	Pass
Subtotal	\$ 23,143,173	\$ 23,669,464	0.0227	0.0146	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 23,143,173	\$ 23,669,464	0.0227	0.0146	Pass	N/A	Pass
Count	65,606	65,606	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 44,180,754	\$ 45,147,038	0.0219	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 9,715,621	\$ 9,929,418	0.0220	0.0059	Pass	Fail	Pass
Terminated Vesteds	578,519	582,291	0.0065	0.0001	Pass	Pass	Pass
DROPs	2,536,403	2,568,957	0.0128	0.0009	Pass	Pass	Pass
Total Inactive	\$ 12,830,543	\$ 13,080,666	0.0195	0.0070	Pass	N/A	Pass
Total	\$ 35,973,716	\$ 36,750,130	0.0216	0.0216	Pass	N/A	Pass

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Gabriel Roeder Smith & Company

FLORIDA RETIREMENT SYSTEM

(\$ 000)

Senior Management (SM) - - Future DROPs Retirement Rates

	<u>Milliman</u>	<u>GRS</u>	<u>Liability Ratio</u>		<u>Liability Test</u>		
			<u>Individual</u>	<u>Total</u>	<u>Individual</u>	<u>PVFB</u>	<u>Composite</u>
			<u>5%</u>	<u>0.5%</u>			
<u>Active PVFB</u>							
Withdrawal / Early Retirement	\$ 232,727	\$ 228,626	(0.0176)	(0.0010)	Pass	Pass	Pass
Retirement	1,988,183	1,998,414	0.0051	0.0025	Pass	Pass	Pass
Non-Duty Death	26,953	27,236	0.0105	0.0001	Pass	Pass	Pass
Duty Death	8,385	9,246	0.1027	0.0002	Fail	Pass	Pass
Non-Duty Disability	25,647	27,776	0.0830	0.0005	Fail	Pass	Pass
Duty Disability	3,957	4,354	0.1003	0.0001	Fail	Pass	Pass
Return of Contributions	22	21	(0.0455)	0.0000	Pass	Pass	Pass
Subtotal	\$ 2,285,874	\$ 2,295,673	0.0043	0.0024	Pass	N/A	Pass
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass
Total Active PVFB	\$ 2,285,874	\$ 2,295,673	0.0043	0.0024	Pass	N/A	Pass
Count	5,779	5,779	0.0000	N/A	Pass	N/A	Pass
Active PVF Salary:	\$ 3,708,173	\$ 3,886,603	0.0481	N/A	Pass	N/A	Pass
<u>Inactive PVFB</u>							
Retirees	\$ 1,121,920	\$ 1,140,236	0.0163	0.0045	Pass	Pass	Pass
Terminated Vesteds	144,636	145,548	0.0063	0.0002	Pass	Pass	Pass
DROPs	494,234	500,912	0.0135	0.0017	Pass	Pass	Pass
Total Inactive	\$ 1,760,790	\$ 1,786,696	0.0147	0.0064	Pass	N/A	Pass
Total	\$ 4,046,664	\$ 4,082,369	0.0088	0.0088	Pass	N/A	Pass

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Gabriel Roecker Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		Regular (REG)+TRS+SCORS + IFAS -- Future DROPs Retirement Rates				Liability Test		
(\$ 000)				Liability Ratio		Individual	PVFB	
<u>Active PVFB</u>	<u>Milliman</u>	<u>GRS</u>	<u>Individual</u>	<u>Total</u>	<u>5%</u>	<u>9.5%</u>	<u>Composite</u>	
Withdrawal/ Early Retirement	\$ 9,570,672	\$ 9,400,917	(0.0177)	(0.0014)	Pass	Pass	Pass	
Retirement	52,928,129	54,190,294	0.0238	0.0103	Pass	Fail	Pass	
Non-Duty Death	895,390	876,769	(0.0208)	(0.0002)	Pass	Pass	Pass	
Duty Death	319,046	347,468	0.0891	0.0002	Fail	Pass	Pass	
Non-Duty Disability	1,340,405	1,443,221	0.0767	0.0008	Fail	Pass	Pass	
Duty Disability	144,674	157,978	0.0920	0.0001	Fail	Pass	Pass	
Return of Contributions	40	127	2.1750	0.0000	Fail	Pass	Pass	
Subtotal	\$ 65,198,356	\$ 66,416,774	0.0187	0.0099	Pass	N/A	Pass	
Less PVF Contributions	2,831	2,831	0.0000	0.0000	Pass	Pass	Pass	
Total Active PVFB	\$ 65,195,525	\$ 66,413,943	0.0187	0.0099	Pass	N/A	Pass	
Count	499,304	499,304	0.0000	N/A	Pass	N/A	Pass	
Active PVF Salary:	\$ 177,572,020	\$ 184,612,552	0.0396	N/A	Pass	N/A	Pass	
<u>Inactive PVFB</u>								
Retirees	\$ 43,196,551	\$ 44,170,814	0.0226	0.0079	Pass	Fail	Pass	
Terminated Vesteds	3,598,926	3,621,727	0.0063	0.0002	Pass	Pass	Pass	
DROPs	11,009,358	11,149,016	0.0127	0.0011	Pass	Pass	Pass	
Total Inactive	\$ 57,804,835	\$ 58,941,557	0.0197	0.0092	Pass	N/A	Pass	
Total	\$123,000,360	\$ 125,355,500	0.0191	0.0191	Pass	N/A	Pass	

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Gabriel Roecker Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		Judicial (J) -- Future DROPs Retirement Rates				Liability Test		
(\$ 000)				Liability Ratio		Individual	PVFB	
<u>Active PVFB</u>	<u>Milliman</u>	<u>GRS</u>	<u>Individual</u>	<u>Total</u>	<u>5%</u>	<u>0.5%</u>	<u>Composite</u>	
Withdrawal/ Early Retirement	\$ 44,791	\$ 43,837	(0.0213)	(0.0007)	Pass	Pass	Pass	
Retirement	572,373	575,516	0.0055	0.0023	Pass	Pass	Pass	
Non-Duty Death	17,772	21,207	0.1933	0.0025	Fail	Pass	Pass	
Duty Death	3,711	3,600	(0.0299)	(0.0001)	Pass	Pass	Pass	
Non-Duty Disability	11,405	11,896	0.0431	0.0004	Pass	Pass	Pass	
Duty Disability	1,867	1,967	0.0536	0.0001	Fail	Pass	Pass	
Return of Contributions	0	3	299.0000	0.0000	Fail	Pass	Pass	
Subtotal	\$ 651,919	\$ 658,026	0.0094	0.0044	Pass	N/A	Pass	
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass	
Total Active PVFB	\$ 651,919	\$ 658,026	0.0094	0.0044	Pass	N/A	Pass	
Count	798	798	0.0000	N/A	Pass	N/A	Pass	
Active PVF Salary:	\$ 998,732	\$ 1,015,284	0.0166	N/A	Pass	N/A	Pass	
<u>Inactive PVFB</u>								
Retirees	\$ 522,163	\$ 528,503	0.0121	0.0045	Pass	Pass	Pass	
Terminated Vesteds	17,383	17,494	0.0064	0.0001	Pass	Pass	Pass	
DROPs	204,896	207,746	0.0139	0.0020	Pass	Pass	Pass	
Total Inactive	\$ 744,442	\$ 753,743	0.0125	0.0067	Pass	N/A	Pass	
Total	\$1,396,361	\$1,411,769	0.0110	0.0110	Pass	N/A	Pass	

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Gabriel Roeder Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		Legislative - Attorney - Cabinet (ESO) -- Future DROPs Retirement Rates						
(\$ 000)						Liability Test		
<u>Active PVFB</u>	Milliman	GRS	Liability Ratio		Individual	PVFB	Composite	
			Individual	Total	5%	0.5%		
Withdrawal / Early Retirement	\$ 7,636	\$ 7,370	(0.0348)	(0.0022)	Pass	Pass	Pass	
Retirement	18,390	18,460	0.0038	0.0006	Pass	Pass	Pass	
Non-Duty Death	673	795	0.1813	0.0010	Fail	Pass	Pass	
Duty Death	165	168	0.0182	0.0000	Pass	Pass	Pass	
Non-Duty Disability	424	452	0.0660	0.0002	Fail	Pass	Pass	
Duty Disability	78	84	0.0769	0.0000	Fail	Pass	Pass	
Return of Contributions	0	0	(1.0000)	0.0000	Fail	Pass	Pass	
Subtotal	\$ 27,366	\$ 27,329	(0.0014)	(0.0003)	Pass	N/A	Pass	
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass	
Total Active PVFB	\$ 27,366	\$ 27,329	(0.0014)	(0.0003)	Pass	N/A	Pass	
Count	120	120	0.0000	N/A	Pass	N/A	Pass	
Active PVF Salary:	\$ 44,013	\$ 45,787	0.0403	N/A	Pass	N/A	Pass	
<u>Inactive PVFB</u>								
Retirees	\$ 60,126	\$ 60,850	0.0120	0.0060	Pass	Fail	Pass	
Terminated Vesteds	10,049	10,107	0.0058	0.0005	Pass	Pass	Pass	
DROP Subtotal	23,671	24,033	0.0153	0.0030	Pass	Pass	Pass	
Total Inactive	\$ 93,846	\$ 94,990	0.0122	0.0094	Pass	N/A	Pass	
Total	\$ 121,212	\$ 122,319	0.0091	0.0091	Pass	N/A	Pass	

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Gabriel Roeder Smith & Company

<u>FLORIDA RETIREMENT SYSTEM</u>		Elected County Officers (ECO) -- Future DROPs Retirement Rates						
(\$ 000)						Liability Test		
<u>Active PVFB</u>	Milliman	GRS	Liability Ratio		Individual	PVFB	Composite	
			Individual	Total	5%	0.5%		
Withdrawal / Early Retirement	\$ 32,663	\$ 31,681	(0.0301)	(0.0014)	Pass	Pass	Pass	
Retirement	171,286	171,823	0.0031	0.0008	Pass	Pass	Pass	
Non-Duty Death	4,898	5,679	0.1595	0.0011	Fail	Pass	Pass	
Duty Death	1,108	1,127	0.0171	0.0000	Pass	Pass	Pass	
Non-Duty Disability	2,885	3,083	0.0686	0.0003	Fail	Pass	Pass	
Duty Disability	490	534	0.0898	0.0001	Fail	Pass	Pass	
Return of Contributions	4	4	0.0000	0.0000	Pass	Pass	Pass	
Subtotal	\$ 213,334	\$ 213,931	0.0028	0.0009	Pass	N/A	Pass	
Less PVF Contributions	0	0	0.0000	0.0000	Pass	Pass	Pass	
Total Active PVFB	\$ 213,334	\$ 213,931	0.0028	0.0009	Pass	N/A	Pass	
Count	925	925	0.0000	N/A	Pass	N/A	Pass	
Active PVF Salary:	\$ 325,495	\$ 337,421	0.0366	N/A	Pass	N/A	Pass	
<u>Inactive PVFB</u>								
Retirees	\$ 367,602	\$ 374,803	0.0196	0.0105	Pass	Fail	Pass	
Terminated Vesteds	30,039	30,221	0.0061	0.0003	Pass	Pass	Pass	
DROPs	72,170	73,184	0.0141	0.0015	Pass	Pass	Pass	
Total Inactive	\$ 469,811	\$ 478,208	0.0179	0.0123	Pass	N/A	Pass	
Total	\$ 683,145	\$ 692,139	0.0132	0.0132	Pass	N/A	Pass	

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Appendix B



Gabriel Roeder Smith & Company
Consultants & Actuaries

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May 25, 2010

Mr. Gary VanLandingham
Director
Government Operations Policy Area
Office of Program Policy Analysis
and Government Accountability
111 West Madison St., Suite 312
Tallahassee, Florida 32399-1475

Re: Experience Study (Actuarial Review)

Dear Mr. VanLandingham:

As requested, we have completed our review of the June 30, 2008 Experience Study Results of the Florida Retirement System Defined Benefit Program (FRS) prepared by Milliman.

Background - Gabriel, Roeder, Smith & Company (GRS) is retained to deliver a letter report to the Office of Program Policy and Government Accountability (OPPAGA) describing our observations, findings and preliminary conclusions regarding the experience study.

We fully expect that the FRS actuaries have applied the principles set forth in Actuarial Standards of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* in developing FRS's economic assumptions. In particular, the actuary should develop a best estimate range for each economic assumption, and then recommend a specific point within that range. After completing the assumption process, the actuary should review the set of economic assumptions for consistency.

The FRS actuary has applied the principles set forth in ASOP No. 35, *Selection of Demographic and Other Noneconomic Actuarial Assumptions for Measuring Pension Obligations* in developing the remaining FRS actuarial assumptions. In particular, the actuary should use professional judgment to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgment. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the System that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

The following are our findings.

1. We believe that the FRS actuaries' recommended actuarial assumptions to be used in the July 1, 2009 Actuarial Valuation are generally **reasonable and appropriate**. While not unreasonable, the inactive healthy mortality rates appear conservative.

Mr. Gary VanLandingham
May 25, 2010
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2. We believe it is incumbent upon the FRS actuaries to demonstrate their **rationale for** each of their recommended **economic actuarial assumptions**. This demonstration should be reviewed prior to the completion of our review of the July 1, 2010 Actuarial Valuation.
3. We have also identified a few areas where **further consideration** of the recommended changes may be warranted - in particular, the proposed mortality rates for healthy inactive (male and female), the proposed mortality rates for active healthy members (females), the proposed withdrawal rates for special risk class members with ten (10) or more years of service (male and female) and the retirement rates for retirement beyond first eligibility for regular and special risk class members (male and female).

We believe further analysis is warranted with respect to **inactive mortality experience**. In particular, there appears to be a gap between observed mortality as reported by the System actuaries and actual mortality based upon independent (Social Security Death Register) data. Additionally, the gap increases if one includes data for inactive included in one actuarial valuation but not included in the next valuation.

4. We believe that the **process** of the actuarial review of the experience study should be **better coordinated** with the actuarial valuation process. In the future, it may be beneficial to allow for discussion between the FRS actuary (Milliman) and the reviewing actuary (GRS) of the proposed actuarial basis prior to locking in the actuarial assumptions to be used in the next actuarial valuation (i.e. experience study through June 30, 2008 / July 1, 2009 Actuarial Valuation).

We believe this could be accomplished if the FRS actuary begins processing the experience study shortly upon completing the last actuarial valuation following the period of the underlying data for the experience study (i.e. next experience study is expected to encompass data through June 30, 2013 to enable discourse prior to completion of the July 1, 2014 Actuarial Valuation). The Experience study should be processed shortly after completion of the July 1, 2013 Actuarial Valuation.

It may be appropriate to have this recommended discussion between the FRS actuaries and GRS currently and reflect any assumption changes in the upcoming July 1, 2010 actuarial valuation.


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We look forward to responding to any questions or comments from the interested parties. If you should have any question concerning the above, please do not hesitate to contact us.

Sincerest regards,



Lawrence F. Wilson, A.S.A.
Senior Consultant and Actuary



Peter N. Strong, A.S.A.
Consultant and Actuary

Enclosure

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

ECONOMIC ASSUMPTIONS

1. The experience study lists no changes in certain key economic assumptions with limited analysis. The System actuaries are not recommending any changes. We further understand that the recommendation of no changes was developed in conjunction with the System investment consultants. The recommended assumptions may be summarized as follows:

	Current / Proposed Assumption
General wage increases: *	4.00%
Investment earnings: *	7.75%
* includes inflation:	3.00%

However, the System actuaries recommend changes to the assumptions for pay increases resulting from promotion and longevity. The System actuaries categorize pay increases due to promotion and longevity as *noneconomic* assumptions. We will follow this convention although we believe that many consider all assumptions relating to salary increases as economic assumptions. We note Section 3.7 of Actuarial Standards of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* addresses selection of a compensation scale.

While maintaining the current economic assumptions may be reasonable and appropriate, we find no demonstration or rationale in the Experience Study report to support the current economic assumptions.

The investment horizons of the System are long term. We currently see a heightened level of differences of opinion among investment consultants of expected future real and nominal investment returns.

We recommend that the System obtain a demonstration or rationale for the proposed economic assumptions.

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

DEMOGRAPHIC AND OTHER NONECONOMIC ASSUMPTIONS

1. Active mortality rates – The System actuaries recommend updating the active mortality rates (separate male and female rates) used for all classes to reflect experience (lower than expected observed active mortality) and general trends in mortality.

The experience study report develops active mortality experience by group. It may be useful to display active mortality combined for all classes consistent with the FRS actuaries’ recommendation to use the updated rates for all classes. The following summarises the results of our calculations combining all classes:

	Females	Males
Exposures	1,877,969	1,079,391
Observed deaths	1,727	2,213
Expected deaths		
- Current rates	2,871.40	2,215.37
- Proposed rates	2,495.41	1,931.60

The ratio of female to male active mortality rates is approximately 74% based upon both the **current** and **proposed** active mortality rates. Observed mortality rates for females, however, were only 45% of observed mortality rates for males. Mortality improvements are incorporated in the proposed mortality rates for both males and females. However, the proposed mortality rates for males appear to be more in line with observed experience than the proposed mortality rates for females. In addition, the current rates for males appear to better reproduce observed experience than the proposed rates.

In addition, under ASOP 35, the actuary is directed to *consider future mortality improvements*. An approach to recognize future mortality improvement is to use generational mortality rates. For example, under generational mortality a male born in 1975 would have different (presumably higher) expected mortality at age 35 than a male born in 1980. We note generational mortality rates are used for healthy inactive mortality. We recommend FRS consider this approach for active mortality.

There may be an issue with the use of generational mortality for active mortality with the software of the FRS actuaries. Another approach to recognition of future mortality experience would be to project the static mortality table to a fixed year. For example, project the proposed mortality (RP 2000) to the valuation year 2009 plus the duration of the active life mortality.

A frequently observed phenomenon in some systems relating to active mortality rates is the fact that some active members become too incapacitated to continue active

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

employment – terminate employment – and die shortly thereafter. It is important to ensure that active mortality experience includes all members who die with survivors being paid active member death benefits.

2. Early retirement / withdrawal rates – The System actuaries combine early retirement and withdrawal rates due to the somewhat unusual early retirement eligibility under FRS (completion of six (6) years of service regardless of age). The FRS actuaries assume early retirement (immediate reduced benefit commencement) for vested members leaving employment within ten (10) years of normal retirement. All other vested terminations are assumed to elect an unreduced deferred benefit commencing at normal retirement date.

In addition, the vesting requirement under FRS is six (6) years of service. The current and proposed rates reflect ten (10) year select and ultimate rates. It is common to use a select period that coincides with the vesting period. We would recommend analyzing whether a six (6) year select period would better match FRS experience when compared to the ten (10) year select period under both current and proposed assumptions. Additional analysis may also be warranted to determine the experience relating to members electing immediate reduced benefits vs. deferring unreduced benefits to normal retirement date.

We used the July 1, 2003 through June 30, 2008 valuation data to attempt to replicate the experience study analysis of the System actuaries. Our analysis led to higher observed withdrawal experience across nearly all classes, genders, ages and years of service than the observed withdrawal experience reported by the System actuaries. The underlying data used in our analysis may differ somewhat from the data used by the System actuaries, and there may be inconsistencies in how withdrawal experience was measured. To be consistent with how the assumptions are applied, we have included terminations and early retirements in our observed experience. In addition, we have assumed a termination of employment occurred whenever a member was absent from the valuation data (but had not deceased) in any year subsequent to a year in which he / she was reported active.

As mentioned, our analysis suggests higher actual withdrawal experience than that of the System actuaries. As a result, we observed several instances in which the proposed withdrawal rates differ from our observed experience by more than the current rates. Some examples of this are shown below:

Class	Assumption Group	Actual Withdrawals	Expected Withdrawals	
			Current	Proposed
Special Risk	Male 10+ years of service	5,601	2,319	1,779
Special Risk	Female 10+ years of service	1,814	583	467

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

Class	Assumption Group	Actual Withdrawals	Expected Withdrawals	
			Current	Proposed
Regular	Male 10+ years of service	15,825	12,910	11,617
Regular	Female 10+ years of service	37,409	30,758	24,817

The following tables show the total impact of the proposed withdrawal rates (based on our analysis) by class, gender and years of service - split by less than six (6) years and six (6) or more years.

Class	Observed Actual Withdrawals	Expected Withdrawals	
		Current	Proposed
Regular			
- Males			
0 – 5 years	40,630	36,738	32,925
6+ years	<u>24,207</u>	<u>20,656</u>	<u>18,814</u>
Total males	64,837	57,394	51,739
- Females			
0 – 5 years	86,711	75,832	69,458
6+ years	<u>60,500</u>	<u>51,655</u>	<u>43,927</u>
Total females	147,211	127,487	113,385
ECO			
- Males			
0 – 5 years	116	84	76
6+ years	<u>113</u>	<u>65</u>	<u>65</u>
Total males	229	149	141
- Females			
0 – 5 years	44	40	40
6+ years	<u>55</u>	<u>36</u>	<u>30</u>
Total females	99	76	70
ESO			
- Males			
0 – 5 years	9	23	22
6+ years	<u>36</u>	<u>21</u>	<u>18</u>
Total males	45	44	40
- Females			
0 – 5 years	5	6	6
6+ years	<u>5</u>	<u>6</u>	<u>6</u>
Total females	10	12	12

EXPERIENCE STUDY – ACTUARIAL REVIEW

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Class	Observed Actual Withdrawals	Expected Withdrawals	
		Current	Proposed
Judges			
- Males			
0 – 5 years	11	14	10
6+ years	<u>65</u>	<u>26</u>	<u>18</u>
Total males	76	40	28
- Females			
0 – 5 years	7	9	8
6+ years	<u>18</u>	<u>15</u>	<u>13</u>
Total females	25	24	21
Senior Management			
- Males			
0 – 5 years	1,539	1,603	1,596
6+ years	<u>436</u>	<u>234</u>	<u>285</u>
Total males	1,975	1,837	1,881
- Females			
0 – 5 years	1,241	1,377	1,434
6+ years	<u>272</u>	<u>180</u>	<u>200</u>
Total females	1,513	1,557	1,634
Special Risk			
- Males			
0 – 5 years	7,458	7,599	6,550
6+ years	<u>8,188</u>	<u>4,080</u>	<u>3,161</u>
Total males	15,646	11,679	9,711
- Females			
0 – 5 years	3,787	3,478	3,239
6+ years	<u>3,013</u>	<u>1,349</u>	<u>1,157</u>
Total females	6,800	4,827	4,396
Special Risk Administrative			
- Males			
0 – 5 years	11	10	10
6+ years	<u>15</u>	<u>5</u>	<u>6</u>
Total males	26	15	16
- Females			
0 – 5 years	11	9	9
6+ years	<u>3</u>	<u>9</u>	<u>9</u>
Total females	14	18	18

3. **Retirement rates and DROP** – We understand FRS determines a contribution for the deferred retirement option program (DROP) as a separate cost center with a single contribution rate paid for all DROP members irrespective of class. We further understand the FRS actuaries have discussed (with FRS) funding the DROP members

EXPERIENCE STUDY – ACTUARIAL REVIEW

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as part of the cost for the class to which they otherwise belong. We understand this approach has not been accepted by FRS.

For purposes of the contribution rate by class, we understand the current and proposed retirement assumptions are net of expected future DROP elections. However, after review and analysis of the proposed retirement assumptions, we understand the proposed retirement rates in the first year of normal retirement eligibility are increased and may reflect an assumption that 50% of the members who may have been expected to enter the DROP would have elected to retire at the time they otherwise would have entered the DROP if the DROP did not exist. We believe this assumption change is an improvement over the current assumption. However, we believe it may not be possible to accurately predict what would happen if a plan provision did not exist, particularly one as significant as the DROP provision. We further believe the 50% assumption may be arbitrary. In addition, we note this adjustment appears to have been only applied to the retirement rates in the initial year of eligibility. While most members are only permitted to enter the DROP in the year in which they first reach eligibility for normal retirement, it might be argued that if the DROP did not exist, then the retirement rates in years subsequent to first eligibility would also be higher, especially if 50% of members who might have otherwise expected to enter the DROP (in the first year of eligibility) were expected to delay retirement beyond the first year of eligibility in the absence of the DROP.

The retirement rates vary by first year of eligibility and thereafter (a one-year select period), age, gender and class – with some classes combined. We believe the breakout by first year eligibility and thereafter (select and ultimate) is a preferred approach and appears to be supported by the data. However, based on our analysis of the observed experience, it appears the rates for retirement in years subsequent to first eligibility should have been increased rather than decreased for two reasons: (1) as explained in the previous paragraph, retirement rates in the first year of eligibility may have been increased by only 50% of estimated DROP rates reflecting the potential retirement experience if the DROP did not exist, but rates in years subsequent to the first year of eligibility did not receive a similar adjustment for the other 50% of members who might otherwise have been expected to enter the DROP, but would be expected to delay retirement beyond the first year of eligibility in the absence of the DROP); and (2) we observed several instances in which our observed experience indicates higher rates of retirement in years subsequent to the year of first eligibility than the current rates. Some examples of this are shown below:

Class	Assumption Group	Actual Retirements	Expected Retirements	
			Current	Proposed
Special Risk	Subsequent Eligibility - Male	2,643	1,190	774
Special Risk	Subsequent Eligibility - Female	344	144	120

EXPERIENCE STUDY – ACTUARIAL REVIEW

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Class	Assumption Group	Actual Retirements	Expected Retirements	
			Current	Proposed
Regular	Subsequent Eligibility - Male	5,959	5,618	3,407
Regular	Subsequent Eligibility - Female	10,237	7,322	6,103

In addition, the retirement rates do not assume 100% probability of retirement until age 80. However, the experience study does not publish rates beyond age 70. This may not be material, but we believe these ultimate ages should be consistent.

4. **Disability rates** – The System actuaries have reviewed incidence of disability experience and have recommended some refinements to the assumed rates of disability. The current disability assumption set includes age and gender rates with separate rates for *line of duty* and *non line of duty* incurred. The classes are combined into four (4) groups. The disability rates for TRS and SCOERS are the same for line of duty and non line of duty incurred.

The proposed rates appear to better mirror System experience. While a minor item, the proposal to combine the Special Risk Administrative group with the Special Risk group may warrant further analysis. The current assumptions also combine the Special Risk Administrative group with the Special Risk group.

5. **Inactive mortality and disabled mortality rates** - The System actuaries recommend updating the inactive mortality rates (separate male and female rates) used for all classes to reflect experience (lower than expected observed healthy inactive mortality for classes with the most members) and general trends in mortality.

The experience study report indicates the FRS actuaries reviewed experience by class and recommend separate healthy inactive mortality rates for the classes combined into two groups.

We initially compiled mortality experience by cross checking Social Security numbers against the Social Security Administration's Death Master File (DMF). The DMF is made available by the Social Security Administration (SSA) and contains over 65 million records created from SSA payment records. Monthly and weekly updates of the file are sold by the National Technical Information Service (NTIS) of the U.S. Department of Commerce.

Additionally, we analyzed the data provided by Milliman for the annual valuations and tracked all records who were reported for a valuation and were not reported for subsequent valuations or who were reported as beneficiary records in subsequent valuations.

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

The following summarises the inactive healthy and disabled experience for the group with most of the observed experience for ages 40 through 80 (ages 25 through 75 for disableds), as reported by the System actuaries, as reported by the SSA Death Master File and as reported as missing records in subsequent years.

Healthy Inactive Mortality

Regular & Special Risk Only	Females	Males
Observed deaths – Milliman	9,510	10,694
Observed deaths – GRS (SSA only)	9,559	10,116
Observed deaths – GRS (missing from subsequent years)	18,653	15,431
Expected deaths		
- Current rates	10,770	13,776
- Proposed rates	8,975	9,374

Disabled Inactive Mortality

Regular & Special Risk Only	Females	Males
Observed deaths – Milliman	1,056	910
Observed deaths – GRS (SSA only)	942	802
Observed deaths – GRS (missing from subsequent years)	985	864
Expected deaths		
- Current rates	1,333	1,108
- Proposed rates	1,088	895

We have prepared detailed tables by age on pages 10 through 17.

We believe the recommendations of the System actuaries for the proposed healthy and disabled mortality rates based upon the recent mortality experience compared to the rates modeled, while conservative, may not be unreasonable. The System actuaries are applying gender based reduction factors to the published mortality tables. Unfortunately, the published mortality rates without reduction may better reproduce observed mortality experience.

We recommend the System analyze the valuation data each year to determine the reason for the high number of records being removed each year for unexplained reasons.

We were again surprised to see the proposed disabled mortality rates for each gender selected from different published mortality studies especially with the minimal amount of observed disabled mortality experience during the experience study period.

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

As previously mentioned, under ASOP 35, the actuary is directed to *consider future mortality improvements*. Again, one approach to recognize future mortality improvement is to use generational mortality rates. For example, under generational mortality a male born in 1975 would have different (expected higher) mortality at age 35 than a male born in 1980. We note generational mortality rates are used for healthy inactive mortality but not for disabled inactive mortality. We recommend the System consider this approach for disabled inactive mortality.

There may be an issue with the use of generational mortality for disabled inactive mortality with the software of the System actuaries. A simplified approach to recognition of future mortality experience would be to project the static mortality table to a fixed year. As previously stated, we believe similar treatment should be considered for active mortality.

6. ***Salary scale*** – The System actuaries have reviewed salary increases due to promotion and longevity. The current assumption set includes expected salary increases from promotion and longevity that are based upon service for the first ten (10) years and age thereafter. The current expected salary increases due to promotion and longevity range from 0.00% - 6.50%.

The proposed assumption set includes expected increases from promotion and longevity that are also based upon service for the first ten (10) years and age thereafter. The current and proposed assumption sets vary by class. The proposed expected salary increases due to promotion and longevity range from 0.00% - 5.47%.

Based upon our analysis of the experience, we concur that the observed salary increases were generally less than expected salary increases based upon the current rates in all classes and a reduction in the rates appears warranted. We also concur with the 10-year select period, as it has been our experience that step increases and promotions tend to be minimal late in careers - step increases and promotion salary increases generally phase out at longer service periods. We believe the general wage increase assumption and the proposed salary increases resulting from promotion and longevity are reasonable based upon System experience and future expectations as modeled in the experience study.

EXPERIENCE STUDY – ACTUARIAL REVIEW

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GRS Observed Deaths - SSA Death Master File

Regular & Special Risk Healthy Inactive Mortality Male							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Milliman	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
40	0.0017	0.0050	0.0034		11.00	12.00	32.25
41	0.0021	0.0052	0.0035		14.00	17.00	35.44
42	0.0025	0.0053	0.0036		19.00	18.00	39.74
43	0.0026	0.0055	0.0038		21.00	26.00	43.87
44	0.0036	0.0058	0.0039		30.00	28.00	47.79
45	0.0038	0.0060	0.0041		33.00	25.00	51.89
46	0.0041	0.0062	0.0042		37.00	35.00	56.18
47	0.0043	0.0064	0.0044		40.00	35.00	60.06
48	0.0033	0.0067	0.0045		32.00	32.00	64.62
49	0.0043	0.0069	0.0047		43.00	38.00	69.46
50	0.0057	0.0072	0.0049		61.00	68.00	77.12
51	0.0039	0.0071	0.0048		98.00	58.00	176.93
52	0.0027	0.0069	0.0047		129.00	75.00	335.38
53	0.0020	0.0068	0.0046		160.00	89.00	538.52
54	0.0017	0.0066	0.0045		191.00	82.00	753.17
55	0.0015	0.0065	0.0044		201.00	121.00	898.13
56	0.0105	0.0065	0.0044		158.00	115.00	97.87
57	0.0118	0.0066	0.0045		194.00	138.00	108.82
58	0.0109	0.0069	0.0047		188.00	165.00	119.05
59	0.0124	0.0073	0.0050		216.00	169.00	126.94
60	0.0138	0.0080	0.0055		238.00	188.00	138.27
61	0.0141	0.0089	0.0061		243.00	177.00	153.78
62	0.0158	0.0100	0.0068		291.00	235.00	184.49
63	0.0164	0.0113	0.0077		329.00	260.00	226.39
64	0.0166	0.0127	0.0087		324.00	263.00	248.11
65	0.0178	0.0143	0.0097		336.00	303.00	270.48
66	0.0183	0.0160	0.0109		337.00	340.00	294.96
67	0.0180	0.0177	0.0121		325.00	327.00	319.51
68	0.0186	0.0194	0.0132		337.00	365.00	351.87
69	0.0202	0.0214	0.0146		366.00	391.00	387.47
70	0.0206	0.0235	0.0160		373.00	402.00	425.62
71	0.0223	0.0261	0.0178		398.00	437.00	466.11
72	0.0262	0.0291	0.0198		460.00	479.00	511.76
73	0.0278	0.0326	0.0222		477.00	473.00	558.62
74	0.0301	0.0366	0.0249		506.00	487.00	614.67
75	0.0314	0.0413	0.0281		511.00	570.00	671.14
76	0.0354	0.0464	0.0316		560.00	582.00	733.38
77	0.0373	0.0523	0.0356		564.00	603.00	790.06
78	0.0420	0.0590	0.0402		602.00	593.00	845.38
79	0.0453	0.0665	0.0452		610.00	630.00	895.06
80	0.0493	0.0747	0.0508		631.00	665.00	955.41
Total					10,694.00	10,116.00	13,775.77

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

GRS Observed Deaths - SSA Death Master File

Regular & Special Risk Healthy Inactive Mortality Female							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Milliman Actual Count	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
40	0.0011	0.0010	0.0008	13.00	13.00	11.68	9.73
41	0.0012	0.0011	0.0009	15.00	20.00	13.62	11.35
42	0.0016	0.0012	0.0010	22.00	22.00	16.06	13.39
43	0.0015	0.0013	0.0011	21.00	24.00	18.53	15.44
44	0.0024	0.0014	0.0012	36.00	19.00	21.17	17.64
45	0.0022	0.0016	0.0013	33.00	27.00	23.79	19.83
46	0.0022	0.0017	0.0014	35.00	33.00	27.19	22.65
47	0.0027	0.0019	0.0016	44.00	44.00	30.42	25.35
48	0.0030	0.0021	0.0017	49.00	35.00	34.54	28.78
49	0.0028	0.0023	0.0019	48.00	60.00	39.51	32.93
50	0.0037	0.0025	0.0021	68.00	54.00	45.54	37.96
51	0.0038	0.0026	0.0022	71.00	56.00	48.89	40.75
52	0.0044	0.0028	0.0024	85.00	60.00	54.48	45.40
53	0.0047	0.0031	0.0026	95.00	90.00	62.53	52.11
54	0.0049	0.0034	0.0029	106.00	102.00	73.29	61.07
55	0.0050	0.0038	0.0032	113.00	123.00	85.87	71.56
56	0.0062	0.0043	0.0036	147.00	125.00	101.45	84.54
57	0.0063	0.0047	0.0040	160.00	127.00	118.70	98.92
58	0.0068	0.0052	0.0044	178.00	146.00	135.48	112.90
59	0.0078	0.0057	0.0048	202.00	151.00	147.13	122.61
60	0.0085	0.0063	0.0052	216.00	168.00	160.91	134.09
61	0.0095	0.0069	0.0057	241.00	216.00	174.54	145.45
62	0.0100	0.0075	0.0063	279.00	225.00	210.19	175.15
63	0.0103	0.0083	0.0069	317.00	247.00	255.07	212.56
64	0.0113	0.0092	0.0076	337.00	255.00	273.89	228.23
65	0.0099	0.0102	0.0085	283.00	263.00	293.05	244.20
66	0.0114	0.0113	0.0094	322.00	306.00	317.85	264.88
67	0.0109	0.0125	0.0104	297.00	303.00	339.70	283.08
68	0.0118	0.0138	0.0115	316.00	324.00	369.93	308.28
69	0.0112	0.0153	0.0128	298.00	367.00	406.98	339.15
70	0.0131	0.0169	0.0141	342.00	359.00	442.71	368.93
71	0.0147	0.0187	0.0156	372.00	409.00	474.56	395.46
72	0.0149	0.0208	0.0174	368.00	454.00	514.34	428.62
73	0.0178	0.0230	0.0192	426.00	420.00	549.25	457.71
74	0.0193	0.0256	0.0213	442.00	459.00	585.72	488.10
75	0.0196	0.0282	0.0235	429.00	473.00	618.56	515.47
76	0.0221	0.0312	0.0260	466.00	504.00	656.45	547.03
77	0.0246	0.0348	0.0290	493.00	583.00	698.45	582.04
78	0.0281	0.0385	0.0321	538.00	593.00	736.15	613.47
79	0.0308	0.0427	0.0356	555.00	645.00	769.77	641.48
80	0.0370	0.0475	0.0396	632.00	655.00	811.59	676.33
Total				9,510.00	9,559.00	10,769.53	8,974.62

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

GRS Observed Deaths - SSA Death Master File

Regular & Special Risk Disabled Inactive Mortality Male							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Milliman Actual Count	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
25	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
26	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
27	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
28	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
29	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
30	0.0000	0.0209	0.0209	0.00	0.00	0.02	0.02
31	0.0000	0.0209	0.0209	0.00	0.00	0.12	0.12
32	0.0000	0.0209	0.0209	0.00	0.00	0.12	0.12
33	0.0000	0.0209	0.0209	0.00	0.00	0.21	0.21
34	0.0000	0.0209	0.0209	0.00	1.00	0.31	0.31
35	0.0000	0.0209	0.0209	0.00	1.00	0.40	0.40
36	0.0774	0.0209	0.0209	2.00	1.00	0.54	0.54
37	0.0000	0.0209	0.0209	0.00	2.00	0.82	0.82
38	0.0190	0.0209	0.0209	1.00	1.00	1.10	1.10
39	0.0435	0.0209	0.0209	3.00	1.00	1.44	1.44
40	0.0000	0.0209	0.0209	0.00	1.00	1.79	1.79
41	0.0166	0.0209	0.0209	2.00	3.00	2.52	2.52
42	0.0203	0.0209	0.0209	3.00	6.00	3.09	3.09
43	0.0157	0.0209	0.0209	3.00	4.00	4.00	4.00
44	0.0295	0.0209	0.0209	7.00	2.00	4.96	4.96
45	0.0175	0.0209	0.0209	5.00	4.00	5.97	5.97
46	0.0090	0.0220	0.0210	3.00	6.00	7.34	6.98
47	0.0224	0.0232	0.0211	9.00	10.00	9.33	8.48
48	0.0234	0.0244	0.0212	11.00	8.00	11.47	9.96
49	0.0229	0.0256	0.0213	13.00	14.00	14.53	12.10
50	0.0239	0.0268	0.0214	16.00	19.00	17.91	14.33
51	0.0276	0.0280	0.0224	21.00	17.00	21.28	17.03
52	0.0283	0.0292	0.0233	24.00	18.00	24.73	19.78
53	0.0195	0.0304	0.0243	18.00	21.00	28.03	22.42
54	0.0247	0.0316	0.0252	25.00	31.00	31.97	25.58
55	0.0286	0.0327	0.0262	31.00	30.00	35.50	28.40
56	0.0340	0.0339	0.0272	38.00	36.00	37.87	30.30
57	0.0367	0.0351	0.0281	47.00	49.00	45.01	36.01
58	0.0317	0.0363	0.0291	42.00	39.00	48.16	38.52
59	0.0324	0.0376	0.0301	44.00	36.00	51.14	40.91
60	0.0358	0.0388	0.0311	50.00	46.00	54.16	43.32
61	0.0292	0.0402	0.0321	40.00	32.00	55.03	44.02
62	0.0367	0.0416	0.0332	47.00	33.00	53.24	42.59
63	0.0306	0.0430	0.0344	38.00	37.00	53.42	42.73
64	0.0359	0.0446	0.0357	42.00	28.00	52.23	41.78
65	0.0326	0.0464	0.0371	35.00	38.00	49.84	39.87
66	0.0424	0.0482	0.0386	41.00	31.00	46.61	37.28
67	0.0357	0.0503	0.0402	31.00	26.00	43.63	34.90
68	0.0389	0.0526	0.0421	31.00	25.00	41.96	33.57
69	0.0458	0.0551	0.0441	33.00	24.00	39.66	31.72
70	0.0442	0.0578	0.0463	30.00	22.00	39.21	31.37
71	0.0296	0.0608	0.0487	18.00	25.00	36.93	29.55
72	0.0602	0.0641	0.0513	34.00	25.00	36.23	28.99
73	0.0598	0.0677	0.0542	29.00	16.00	32.84	26.28
74	0.0409	0.0716	0.0573	18.00	14.00	31.52	25.21
75	0.0644	0.0758	0.0607	25.00	19.00	29.42	23.54
Total				910.00	802.00	1,107.61	894.93

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

GRS Observed Deaths - SSA Death Master File

Regular & Special Risk Disabled Inactive Mortality Female							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Milliman Actual Count	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
25	0.0000	0.0272	0.0218	0.00	0.00	0.00	0.00
26	0.0000	0.0266	0.0213	0.00	0.00	0.03	0.02
27	0.0000	0.0262	0.0210	0.00	0.00	0.03	0.02
28	0.0000	0.0256	0.0205	0.00	0.00	0.06	0.04
29	0.0000	0.0251	0.0201	0.00	0.00	0.08	0.06
30	0.0000	0.0246	0.0196	0.00	0.00	0.04	0.04
31	0.0000	0.0240	0.0192	0.00	0.00	0.04	0.04
32	0.0000	0.0235	0.0188	0.00	0.00	0.12	0.10
33	0.0000	0.0230	0.0184	0.00	0.00	0.18	0.15
34	0.0000	0.0226	0.0181	0.00	0.00	0.23	0.18
35	0.0529	0.0222	0.0177	1.00	3.00	0.42	0.34
36	0.0595	0.0220	0.0176	2.00	0.00	0.74	0.60
37	0.0490	0.0218	0.0174	2.00	0.00	0.89	0.71
38	0.0000	0.0215	0.0172	0.00	1.00	1.29	1.03
39	0.0000	0.0215	0.0172	0.00	2.00	1.75	1.39
40	0.0179	0.0217	0.0173	2.00	1.00	2.43	1.94
41	0.0067	0.0218	0.0174	1.00	3.00	3.24	2.59
42	0.0204	0.0221	0.0177	4.00	5.00	4.33	3.46
43	0.0122	0.0224	0.0179	3.00	5.00	5.52	4.42
44	0.0168	0.0227	0.0182	5.00	8.00	6.76	5.41
45	0.0164	0.0232	0.0186	6.00	6.00	8.51	6.81
46	0.0210	0.0237	0.0190	9.00	8.00	10.15	8.12
47	0.0185	0.0243	0.0195	10.00	14.00	13.15	10.52
48	0.0275	0.0251	0.0201	17.00	7.00	15.52	12.41
49	0.0185	0.0258	0.0206	14.00	12.00	19.48	15.58
50	0.0180	0.0266	0.0213	16.00	17.00	23.69	18.96
51	0.0142	0.0274	0.0219	15.00	18.00	28.94	23.15
52	0.0167	0.0282	0.0225	20.00	20.00	33.87	27.09
53	0.0202	0.0291	0.0233	27.00	24.00	38.83	31.06
54	0.0232	0.0298	0.0239	34.00	39.00	43.62	34.90
55	0.0193	0.0306	0.0244	31.00	32.00	49.11	39.29
56	0.0281	0.0312	0.0249	48.00	49.00	53.36	42.69
57	0.0291	0.0318	0.0254	54.00	45.00	58.97	47.18
58	0.0257	0.0326	0.0261	51.00	58.00	64.78	51.83
59	0.0287	0.0335	0.0268	58.00	41.00	67.69	54.16
60	0.0275	0.0343	0.0274	56.00	48.00	69.92	55.93
61	0.0302	0.0351	0.0281	63.00	50.00	73.30	58.64
62	0.0243	0.0359	0.0288	49.00	36.00	72.33	57.86
63	0.0266	0.0368	0.0294	49.00	40.00	67.89	54.31
64	0.0208	0.0375	0.0300	36.00	28.00	64.95	51.96
65	0.0307	0.0383	0.0326	50.00	49.00	62.29	52.95
66	0.0284	0.0392	0.0333	40.00	34.00	55.18	46.90
67	0.0372	0.0400	0.0340	46.00	38.00	49.43	42.02
68	0.0379	0.0408	0.0347	43.00	31.00	46.29	39.34
69	0.0340	0.0416	0.0354	34.00	37.00	41.56	35.33
70	0.0429	0.0426	0.0362	37.00	24.00	36.70	31.20
71	0.0433	0.0436	0.0371	32.00	25.00	32.19	27.36
72	0.0390	0.0449	0.0381	25.00	23.00	28.75	24.44
73	0.0521	0.0463	0.0394	30.00	13.00	26.68	22.67
74	0.0392	0.0482	0.0409	20.00	24.00	24.57	20.89
75	0.0350	0.0510	0.0433	16.00	24.00	23.30	19.80
Total				1,056.00	942.00	1,333.18	1,087.89

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

GRS Observed Deaths - Missing Records

Regular & Special Risk Healthy Inactive Mortality Male							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Millinan Actual Count	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
40	0.0017	0.0050	0.0034	11.00	4.00	32.25	21.95
41	0.0021	0.0052	0.0035	14.00	8.00	35.44	24.12
42	0.0025	0.0053	0.0036	19.00	4.00	39.74	27.04
43	0.0026	0.0055	0.0038	21.00	15.00	43.87	29.85
44	0.0036	0.0058	0.0039	30.00	16.00	47.79	32.52
45	0.0038	0.0060	0.0041	33.00	18.00	51.89	35.31
46	0.0041	0.0062	0.0042	37.00	29.00	56.18	38.23
47	0.0043	0.0064	0.0044	40.00	33.00	60.06	40.87
48	0.0033	0.0067	0.0045	32.00	36.00	64.62	43.97
49	0.0043	0.0069	0.0047	43.00	58.00	69.46	47.26
50	0.0057	0.0072	0.0049	61.00	88.00	77.12	52.48
51	0.0039	0.0071	0.0048	98.00	129.00	176.93	120.39
52	0.0027	0.0069	0.0047	129.00	141.00	335.38	228.21
53	0.0020	0.0068	0.0046	160.00	204.00	538.52	366.45
54	0.0017	0.0066	0.0045	191.00	261.00	753.17	512.50
55	0.0015	0.0065	0.0044	201.00	320.00	898.13	611.14
56	0.0105	0.0065	0.0044	158.00	538.00	97.87	66.60
57	0.0118	0.0066	0.0045	194.00	590.00	108.82	74.05
58	0.0109	0.0069	0.0047	188.00	654.00	119.05	81.00
59	0.0124	0.0073	0.0050	216.00	680.00	126.94	86.38
60	0.0138	0.0080	0.0055	238.00	599.00	138.27	94.09
61	0.0141	0.0089	0.0061	243.00	687.00	153.78	104.64
62	0.0158	0.0100	0.0068	291.00	483.00	184.49	125.53
63	0.0164	0.0113	0.0077	329.00	605.00	226.39	154.05
64	0.0166	0.0127	0.0087	324.00	626.00	248.11	168.82
65	0.0178	0.0143	0.0097	336.00	573.00	270.48	184.06
66	0.0183	0.0160	0.0109	337.00	765.00	294.96	200.71
67	0.0180	0.0177	0.0121	325.00	476.00	319.51	217.41
68	0.0186	0.0194	0.0132	337.00	461.00	351.87	239.43
69	0.0202	0.0214	0.0146	366.00	468.00	387.47	263.65
70	0.0206	0.0235	0.0160	373.00	441.00	425.62	289.62
71	0.0223	0.0261	0.0178	398.00	498.00	466.11	317.17
72	0.0262	0.0291	0.0198	460.00	483.00	511.76	348.23
73	0.0278	0.0326	0.0222	477.00	531.00	558.62	380.11
74	0.0301	0.0366	0.0249	506.00	489.00	614.67	418.26
75	0.0314	0.0413	0.0281	511.00	566.00	671.14	456.68
76	0.0354	0.0464	0.0316	560.00	525.00	733.38	499.03
77	0.0373	0.0523	0.0356	564.00	583.00	790.06	537.60
78	0.0420	0.0590	0.0402	602.00	569.00	845.38	575.25
79	0.0453	0.0665	0.0452	610.00	601.00	895.06	609.05
80	0.0493	0.0747	0.0508	631.00	576.00	955.41	650.11
Total				10,694.00	15,431.00	13,775.77	9,373.82

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

GRS Observed Deaths - Missing Records

Regular & Special Risk Healthy Inactive Mortality Female							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Millinan Actual Count	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
40	0.0011	0.0010	0.0008	13.00	4.00	11.68	9.73
41	0.0012	0.0011	0.0009	15.00	9.00	13.62	11.35
42	0.0016	0.0012	0.0010	22.00	5.00	16.06	13.39
43	0.0015	0.0013	0.0011	21.00	9.00	18.53	15.44
44	0.0024	0.0014	0.0012	36.00	12.00	21.17	17.64
45	0.0022	0.0016	0.0013	33.00	8.00	23.79	19.83
46	0.0022	0.0017	0.0014	35.00	24.00	27.19	22.65
47	0.0027	0.0019	0.0016	44.00	25.00	30.42	25.35
48	0.0030	0.0021	0.0017	49.00	42.00	34.54	28.78
49	0.0028	0.0023	0.0019	48.00	45.00	39.51	32.93
50	0.0037	0.0025	0.0021	68.00	60.00	45.54	37.96
51	0.0038	0.0026	0.0022	71.00	110.00	48.89	40.75
52	0.0044	0.0028	0.0024	85.00	152.00	54.48	45.40
53	0.0047	0.0031	0.0026	95.00	211.00	62.53	52.11
54	0.0049	0.0034	0.0029	106.00	308.00	73.29	61.07
55	0.0050	0.0038	0.0032	113.00	427.00	85.87	71.56
56	0.0062	0.0043	0.0036	147.00	754.00	101.45	84.54
57	0.0063	0.0047	0.0040	160.00	793.00	118.70	98.92
58	0.0068	0.0052	0.0044	178.00	822.00	135.48	112.90
59	0.0078	0.0057	0.0048	202.00	876.00	147.13	122.61
60	0.0085	0.0063	0.0052	216.00	730.00	160.91	134.09
61	0.0095	0.0069	0.0057	241.00	839.00	174.54	145.45
62	0.0100	0.0075	0.0063	279.00	743.00	210.19	175.15
63	0.0103	0.0083	0.0069	317.00	927.00	255.07	212.56
64	0.0113	0.0092	0.0076	337.00	936.00	273.89	228.23
65	0.0099	0.0102	0.0085	283.00	890.00	293.05	244.20
66	0.0114	0.0113	0.0094	322.00	1117.00	317.85	264.88
67	0.0109	0.0125	0.0104	297.00	653.00	339.70	283.08
68	0.0118	0.0138	0.0115	316.00	540.00	369.93	308.28
69	0.0112	0.0153	0.0128	298.00	497.00	406.98	339.15
70	0.0131	0.0169	0.0141	342.00	482.00	442.71	368.93
71	0.0147	0.0187	0.0156	372.00	455.00	474.56	395.46
72	0.0149	0.0208	0.0174	368.00	508.00	514.34	428.62
73	0.0178	0.0230	0.0192	426.00	490.00	549.25	457.71
74	0.0193	0.0256	0.0213	442.00	497.00	585.72	488.10
75	0.0196	0.0282	0.0235	429.00	517.00	618.56	515.47
76	0.0221	0.0312	0.0260	466.00	544.00	656.45	547.03
77	0.0246	0.0348	0.0290	493.00	588.00	698.45	582.04
78	0.0281	0.0385	0.0321	538.00	598.00	736.15	613.47
79	0.0308	0.0427	0.0356	555.00	672.00	769.77	641.48
80	0.0370	0.0475	0.0396	632.00	734.00	811.59	676.33
Total				9,510.00	18,653.00	10,769.53	8,974.62

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

GRS Observed Deaths - Missing Records

Regular & Special Risk Disabled Inactive Mortality Male							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Millman Actual Count	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
25	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
26	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
27	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
28	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
29	0.0000	0.0209	0.0209	0.00	0.00	0.00	0.00
30	0.0000	0.0209	0.0209	0.00	1.00	0.02	0.02
31	0.0000	0.0209	0.0209	0.00	0.00	0.12	0.12
32	0.0000	0.0209	0.0209	0.00	0.00	0.12	0.12
33	0.0000	0.0209	0.0209	0.00	0.00	0.21	0.21
34	0.0000	0.0209	0.0209	0.00	0.00	0.31	0.31
35	0.0000	0.0209	0.0209	0.00	2.00	0.40	0.40
36	0.0774	0.0209	0.0209	2.00	0.00	0.54	0.54
37	0.0000	0.0209	0.0209	0.00	1.00	0.82	0.82
38	0.0190	0.0209	0.0209	1.00	4.00	1.10	1.10
39	0.0435	0.0209	0.0209	3.00	0.00	1.44	1.44
40	0.0000	0.0209	0.0209	0.00	3.00	1.79	1.79
41	0.0166	0.0209	0.0209	2.00	3.00	2.52	2.52
42	0.0203	0.0209	0.0209	3.00	5.00	3.09	3.09
43	0.0157	0.0209	0.0209	3.00	5.00	4.00	4.00
44	0.0295	0.0209	0.0209	7.00	6.00	4.96	4.96
45	0.0175	0.0209	0.0209	5.00	4.00	5.97	5.97
46	0.0090	0.0220	0.0210	3.00	6.00	7.34	6.98
47	0.0224	0.0232	0.0211	9.00	6.00	9.33	8.48
48	0.0234	0.0244	0.0212	11.00	12.00	11.47	9.96
49	0.0229	0.0256	0.0213	13.00	14.00	14.53	12.10
50	0.0239	0.0268	0.0214	16.00	16.00	17.91	14.33
51	0.0276	0.0280	0.0224	21.00	21.00	21.28	17.03
52	0.0283	0.0292	0.0233	24.00	16.00	24.73	19.78
53	0.0195	0.0304	0.0243	18.00	19.00	28.03	22.42
54	0.0247	0.0316	0.0252	25.00	25.00	31.97	25.58
55	0.0286	0.0327	0.0262	31.00	34.00	35.50	28.40
56	0.0340	0.0339	0.0272	38.00	41.00	37.87	30.30
57	0.0367	0.0351	0.0281	47.00	44.00	45.01	36.01
58	0.0317	0.0363	0.0291	42.00	44.00	48.16	38.52
59	0.0324	0.0376	0.0301	44.00	48.00	51.14	40.91
60	0.0358	0.0388	0.0311	50.00	34.00	54.16	43.32
61	0.0292	0.0402	0.0321	40.00	42.00	55.03	44.02
62	0.0367	0.0416	0.0332	47.00	36.00	53.24	42.59
63	0.0306	0.0430	0.0344	38.00	43.00	53.42	42.73
64	0.0359	0.0446	0.0357	42.00	33.00	52.23	41.78
65	0.0326	0.0464	0.0371	35.00	41.00	49.84	39.87
66	0.0424	0.0482	0.0386	41.00	28.00	46.61	37.28
67	0.0357	0.0503	0.0402	31.00	35.00	43.63	34.90
68	0.0389	0.0526	0.0421	31.00	33.00	41.96	33.57
69	0.0458	0.0551	0.0441	33.00	26.00	39.66	31.72
70	0.0442	0.0578	0.0463	30.00	15.00	39.21	31.37
71	0.0296	0.0608	0.0487	18.00	38.00	36.93	29.55
72	0.0602	0.0641	0.0513	34.00	28.00	36.23	28.99
73	0.0598	0.0677	0.0542	29.00	15.00	32.84	26.28
74	0.0409	0.0716	0.0573	18.00	24.00	31.52	25.21
75	0.0644	0.0758	0.0607	25.00	13.00	29.42	23.54
Total				910.00	864.00	1,107.61	894.93

EXPERIENCE STUDY – ACTUARIAL REVIEW

EXHIBIT

GRS Observed Deaths - Missing Records

Regular & Special Risk Disabled Inactive Mortality Female							
Age	Actual Rate	Expected Rate (Current)	Expected Rate (Proposed)	Millman Actual Count	GRS Actual Count	Expected Count (Current)	Expected Count (Proposed)
25	0.0000	0.0272	0.0218	0.00	0.00	0.00	0.00
26	0.0000	0.0266	0.0213	0.00	0.00	0.03	0.02
27	0.0000	0.0262	0.0210	0.00	0.00	0.03	0.02
28	0.0000	0.0256	0.0205	0.00	0.00	0.06	0.04
29	0.0000	0.0251	0.0201	0.00	0.00	0.08	0.06
30	0.0000	0.0246	0.0196	0.00	0.00	0.04	0.04
31	0.0000	0.0240	0.0192	0.00	0.00	0.04	0.04
32	0.0000	0.0235	0.0188	0.00	0.00	0.12	0.10
33	0.0000	0.0230	0.0184	0.00	0.00	0.18	0.15
34	0.0000	0.0226	0.0181	0.00	0.00	0.23	0.18
35	0.0529	0.0222	0.0177	1.00	1.00	0.42	0.34
36	0.0595	0.0220	0.0176	2.00	2.00	0.74	0.60
37	0.0490	0.0218	0.0174	2.00	0.00	0.89	0.71
38	0.0000	0.0215	0.0172	0.00	1.00	1.29	1.03
39	0.0000	0.0215	0.0172	0.00	3.00	1.75	1.39
40	0.0179	0.0217	0.0173	2.00	1.00	2.43	1.94
41	0.0067	0.0218	0.0174	1.00	2.00	3.24	2.59
42	0.0204	0.0221	0.0177	4.00	2.00	4.33	3.46
43	0.0122	0.0224	0.0179	3.00	5.00	5.52	4.42
44	0.0168	0.0227	0.0182	5.00	6.00	6.76	5.41
45	0.0164	0.0232	0.0186	6.00	7.00	8.51	6.81
46	0.0210	0.0237	0.0190	9.00	8.00	10.15	8.12
47	0.0185	0.0243	0.0195	10.00	12.00	13.15	10.52
48	0.0275	0.0251	0.0201	17.00	14.00	15.52	12.41
49	0.0185	0.0258	0.0206	14.00	13.00	19.48	15.58
50	0.0180	0.0266	0.0213	16.00	10.00	23.69	18.96
51	0.0142	0.0274	0.0219	15.00	22.00	28.94	23.15
52	0.0167	0.0282	0.0225	20.00	26.00	33.87	27.09
53	0.0202	0.0291	0.0233	27.00	24.00	38.83	31.06
54	0.0232	0.0298	0.0239	34.00	28.00	43.62	34.90
55	0.0193	0.0306	0.0244	31.00	40.00	49.11	39.29
56	0.0281	0.0312	0.0249	48.00	45.00	53.36	42.69
57	0.0291	0.0318	0.0254	54.00	51.00	58.97	47.18
58	0.0257	0.0326	0.0261	51.00	49.00	64.78	51.83
59	0.0287	0.0335	0.0268	58.00	55.00	67.69	54.16
60	0.0275	0.0343	0.0274	56.00	56.00	69.92	55.93
61	0.0302	0.0351	0.0281	63.00	47.00	73.30	58.64
62	0.0243	0.0359	0.0288	49.00	40.00	72.33	57.86
63	0.0266	0.0368	0.0294	49.00	39.00	67.89	54.31
64	0.0208	0.0375	0.0300	36.00	45.00	64.95	51.96
65	0.0307	0.0383	0.0326	50.00	38.00	62.29	52.95
66	0.0284	0.0392	0.0333	40.00	44.00	55.18	46.90
67	0.0372	0.0400	0.0340	46.00	39.00	49.43	42.02
68	0.0379	0.0408	0.0347	43.00	34.00	46.29	39.34
69	0.0340	0.0416	0.0354	34.00	36.00	41.56	35.33
70	0.0429	0.0426	0.0362	37.00	27.00	36.70	31.20
71	0.0433	0.0436	0.0371	32.00	27.00	32.19	27.36
72	0.0390	0.0449	0.0381	25.00	26.00	28.75	24.44
73	0.0521	0.0463	0.0394	30.00	17.00	26.68	22.67
74	0.0392	0.0482	0.0409	20.00	15.00	24.57	20.89
75	0.0350	0.0510	0.0433	16.00	28.00	23.30	19.80
Total				1,056.00	985.00	1,333.18	1,087.89

Appendix C



Office of the Secretary
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Governor Charlie Crist

Secretary Linda H. South

June 29, 2010

Mr. Gary R. VanLandingham, Director
Office of Program Policy Analysis and
Government Accountability
Claude Pepper Building Room 312
111 West Madison Street
Tallahassee, FL 32399-1450

Dear Mr. VanLandingham:

Pursuant to Section 11.51(5), Florida Statutes, attached is the Department of Management Services' response to your preliminary and tentative audit report, **Florida Retirement System Pension Plan Valuation Met Standards**. The attached response corresponds with the order of your preliminary and tentative audit findings and recommendations.

If further information is needed concerning our response, please contact Steve Rumph, Inspector General, at 488-5285.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. South'.

Linda H. South
Secretary

Attachment

cc: David Faulkenberry, Deputy Secretary
Sarabeth Snuggs, Director of Retirement

We serve those who serve Florida.

Mr. Gary R. VanLandingham
June 29, 2010
Attachment Page 1

Florida Department of Management Services
Response to OPPAGA's
Preliminary Findings and Recommendations

Findings:

- The Pension Plan's 2009 valuation is based on the results of a recently completed experience study.
- The Pension Plan's 2009 valuation was conducted in accordance with standards, and its assumptions and methods are reasonable.
- In 2009, the actuarial value of pension fund assets decreased significantly and the plan is no longer fully funded.

Recommendations:

Based on the review by Gabriel, Roeder, Smith & Company, we continue to make the following recommendations.

- *We recommend that the actuarial valuation of the Florida Retirement System include disclosures of the normal costs and actuarial gains and losses fully reflecting the DROP, as well as the disclosure of the present value of future benefits fully reflecting the DROP. Inclusion of these disclosures would provide valuable information to the Legislature regarding DROP.*
- *We recommend that the actuarial valuation provide prior year results along with side-by-side current year results as appropriate. This information would provide a ready comparison both in terms of changes in values and in terms of percentage changes in the Florida Retirement System's membership, assets, and benefits.*
- *We recommend that DROP be funded in a traditional manner because the current method adds complexity to the system, increases costs for each actuarial study that includes a DROP analysis because the calculations must be completed twice, and shifts a significant portion of the cost of funding DROP to Regular Class employers.*

Mr. Gary R. VanLandingham
June 29, 2010
Attachment Page 2

Response:

We are pleased with the conclusion from Gabriel, Roeder, Smith & Company that the 2009 actuarial valuation was made in accordance with relevant state laws and rules and actuarial standards and that the assumptions and methods used in the 2009 valuation were reasonable.

Our responses to the recommendations are:

- **Non-Concur:** The Legislature has studied two more traditional funding methods for DROP but has not taken any action to make changes to the current method. The development of actuarial gains and losses, normal cost, and the present value of future benefits vary under these methodologies. To generate the recommended information will require additional funding to expand the annual valuation. The Department will await guidance from the FRS Actuarial Assumptions Conference (Conference) and the Legislature.
- **Non-Concur:** The Department believes that the FRS Actuarial Report as of July 1, 2009 includes appropriate year-by-year comparisons throughout the document. For example, the comparison in changes from the last valuation including numerical and percentage changes are already provided for assets and liabilities in the Executive Summary on pages I-1 and I-2. Membership change comparisons are provided on page I-5. Sections II and III contain comparative charts of the changes in assets and liabilities. If additional data comparisons are needed, we ask that the specific data and tables be identified in order for the Department to be able to respond to a specific recommendation.
- **Non-Concur:** The current funding of the DROP and the disclosure approach in the FRS actuarial valuation results from laws enacted by the Legislature and specific instructions from the Conference (s. 216.135(10), F.S.). The Conference consists of principals from the Governor's Office and staff designated by the Senate and the House of Representatives. The Department does not have a statutorily prescribed role in the Conference, but does provide support to the contracted actuary and the Conference and attends the Conference meetings.

The Legislature requested and received special actuarial studies dated March 23, 2007 and January 10, 2010, about funding DROP in a more traditional manner. No action has been taken by the Legislature to change DROP funding. The Department's contracted actuary would certainly comply if the Conference recommends changing the DROP funding method and the Legislature agrees or if the Conference recommends expanding the valuation

Mr. Gary R. VanLandingham
June 29, 2010
Attachment Page 3

report to provide comparison DROP funding statements until a more traditional DROP funding method is authorized.

Expanding the valuation report to include this additional work would increase the annual cost of the valuation and would require funding by the Legislature.

The Department and the contracted actuary continue to recommend the adoption of a more traditional funding approach to DROP.