



WASHINGTON STATE LEGISLATURE
Office of the State Actuary

September 9, 2004

Mr. Steve Nelsen, Executive Director
Law Enforcement Officers' and Fire Fighters' Plan 2 Retirement Board
P.O. Box 40918
Olympia, Washington 98504-0918

Dear Steve:

RE: RECOMMENDED 2005-07 CONTRIBUTION RATES

Based on the results of the 2003 actuarial valuation of the Law Enforcement Officers' and Fire Fighters' Retirement System Plan 2 (LEOFF 2), I am forwarding recommended member, employer and state contribution rates for the 2005-07 biennium. These rates are provided below:

- 7.20% for members;
- 4.32% for employers; and
- 2.88% for the state.

Please note that the recommended employer contribution rate does not include the current administrative expense rate of 0.19%.

The primary purpose of the valuation was to determine contribution requirements for LEOFF Plan 2 as of the valuation date September 30, 2003 and should not be used for other purposes. The results are based on the economic assumptions and asset value smoothing technique included in RCW 41.45.035 and funding policy established under Chapter 41.45 RCW.

I will forward a final actuarial valuation report to the board this fall. In the meantime, please don't hesitate to contact me directly should you require any additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew M. Smith".

Matthew M. Smith
State Actuary

cc: Marty McCaulay

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**LEOFF Plan 2 Retirement Board
Actuarial Audit Report**

**Prepared for September 22, 2004
Board Meeting**

Prepared by:

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September 22, 2004

LEOFF Plan 2 Retirement Board
c/o Mr. Steve Nelsen
Executive Director
P.O. Box 40918
Olympia, WA 98504-0918

Dear Mr. Nelsen:

The enclosed report presents the findings and comments resulting from a detailed review of the actuarial valuation performed by the Office of the State Actuary (OSA). An overview of our major findings is included in the Executive Summary section of the report. More detailed commentary on our review process is included in the latter sections.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the OSA staff and the Department of Retirement Systems (DRS). This information includes, but is not limited to, statutory provisions, employee data and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data reported and used for other purposes. It should be noted that if any data or other information provided to us is inaccurate or incomplete, our calculations and recommendations may need to be revised.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

Any distribution of the enclosed report must be in its entirety including this cover letter, unless prior written consent is obtained from Milliman, Inc.

We would like to express our appreciation to both the OSA and DRS staff for their complete and timely cooperation in supplying the data on which this report is based.



LEOFF Plan 2 Retirement Board
September 22, 2004
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I, Karen I. Steffen, am a member of the American Academy of Actuaries and a Fellow of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I, Nick J. Collier, am a member of the American Academy of Actuaries and an Associate of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

We respectfully submit the following report, and we look forward to discussing it with you and the LEOFF Plan 2 Retirement Board.

Sincerely,

Karen I. Steffen, F.S.A., M.A.A.A.
Consulting Actuary

Nick J. Collier, A.S.A., M.A.A.A.
Associate Actuary

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Section 1 Executive Summary

Purpose and Scope of the Actuarial Audit

This actuarial audit reviews the September 30, 2003 actuarial valuation performed by the Office of the State Actuary (OSA) which sets the contribution rate for adoption by the LEOFF Plan 2 Retirement Board. The purpose is to determine if the methodology used by the OSA is reasonable and that the contribution rates are calculated appropriately.

As requested, the following tasks were performed in this audit:

- ✓ Liability calculations were checked by performing a full independent parallel valuation.
- ✓ The use of assets values was reviewed.
- ✓ The calculation of contribution rates was validated.

Statement of Key Findings

Based upon our review of the September 30, 2003 actuarial valuation, we found the actuarial work we reviewed was reasonable and appropriate. The resulting contribution rates for the 2005-2007 biennium reasonably reflect the actuarial assets and liabilities.

Our conclusions concerning the primary issues of this review are as follows:

- ❑ **Qualifications:** The September 30, 2003 actuarial valuation for the LEOFF Plan 2 Retirement Board was performed by a qualified actuary and is in accordance with the principles and practices prescribed by the Actuarial Standards Board.
- ❑ **Membership Data:** We performed tests on the raw data and the valuation data. Based on this review, we feel the data used in the valuation is appropriate.
- ❑ **Actuarial Value of Assets:** We have confirmed that the actuarial value of the assets calculated for the September 30, 2003 valuation is accurate based on the information provided to us. We also find the methodology to be reasonable and in compliance with actuarial standards of practice, although the current method is uncommon.
- ❑ **Actuarial Liabilities:** One purpose of this actuarial review is to verify the benefits and liabilities. We independently calculated the total liabilities of LEOFF 2. We found that the benefit provisions of LEOFF 2 were accounted for in an accurate manner, the actuarial assumptions and methods are being applied correctly, and that our total liabilities matched those calculated by the OSA within a reasonable level of tolerance.



LEOFF Plan 2 Retirement Board Actuarial Audit Report

- ❑ **Funding:** We reviewed the application of the funding method and find it is reasonable and that it meets generally accepted actuarial standards. Based on the plan's funding methods and assumptions, we believe the contribution rates are accurately calculated.
- ❑ **Assumptions:** The review of actuarial assumptions is beyond the scope of this audit. The current set of assumptions was reviewed two years ago. At that time, we concluded that the assumptions were "reasonable and appropriate" to use in the actuarial valuation.
- ❑ **OSA Valuation Report:** The formal report will not be issued until after the completion of the audit, so a review of the report is not included in this audit. However, we would note that in looking at the 2002 valuation report, there was a definite improvement in form and content over the prior report.
- ❑ **Recommendations & Considerations:** We are not recommending any changes to the valuation. There is one area where a change might be considered in the future:
 - ✓ **Audited Assets:** The OSA is in an unusual situation compared to most other actuaries in that the financial and asset information must be first compiled by their staff before an analysis for actuarial valuation purposes can be performed. This is because the audited financial statements are as of June 30; whereas the valuation date is as of September 30. We realize there are reasons for the current procedures, however, it would be preferable to have audited financial statements consistent with the valuation date.



Section 2 Qualifications

Audit Conclusions

The September 30, 2003 actuarial valuation for LEOFF Plan 2 Retirement Board was performed by a qualified actuary and is in accordance with the principles and practices prescribed by the Actuarial Standards Board.

Comments

Qualifications

The actuarial valuation was performed by the State Actuary, Mr. Matthew Smith, with assistance from his staff. We believe Mr. Smith is qualified to perform the actuarial valuation.

Under the qualification standards issued by the American Academy of Actuaries, an actuary must meet each of the following three requirements to be qualified to render a prescribed statement of actuarial opinion:

- ✓ **Basic Education:** Mr. Smith has completed the examinations offered by the Joint Board for the Enrollment of Actuaries and is an enrolled actuary under ERISA. This satisfies this requirement.
- ✓ **Experience:** Mr. Smith is experienced in performing pension valuations. In particular, he has experience working with public-sector retirement systems. This satisfies this requirement.
- ✓ **Continuing Education:** Mr. Smith is an enrolled actuary under ERISA. As such, he must meet minimum continuing education requirements to maintain this designation. This continuing education satisfies this requirement.

Actuarial Standards of Practice

We compared the work performed in the valuation with the Actuarial Standards of Practice (ASOP) prescribed by the Actuarial Standards Board. In particular, we confirmed that the work conforms to the ASB's Code of Professional Conduct and the relevant ASOPs:

- ✓ **ASOP #4: *Measuring Pension Obligations*** – We believe that the OSA's work is consistent with this standard.
- ✓ **ASOP #27: *Selection of Economic Assumptions for Measuring Pension Obligations*** – The purpose of this audit was not to review the assumptions. However, based on our prior audit performed two years ago, we believe that the work is consistent with this standard.



LEOFF Plan 2 Retirement Board Actuarial Audit Report

- ✓ ASOP #35: *Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations* – The purpose of this audit was not to review the assumptions. However, based on our prior audit performed two years ago, we believe that the work is consistent with this standard.
- ✓ ASOP #XX (Currently in draft form): *Selection of Asset Valuation Methods for Pension Valuations* – We believe that the OSA's work is consistent with this standard.



Section 3 Membership Data

Audit Conclusions

We performed tests on the raw data and the valuation data. Based on this review, we feel the data used in the valuation is appropriate.

Comments

Overall, the data process appears to be thorough and accurate. We would add the following comments:

- ❑ **Raw Data:** DRS provide us with the same data that was supplied to the OSA for use in the actuarial valuation.
- ✓ **Completeness:** The data was quite comprehensive and contained all necessary fields to perform the actuarial valuation.
- ✓ **Quality:** We compared the DRS data to information from actual benefit calculations for sample members. We found the data to be consistent.
- ❑ **Editing:** The OSA staff performs extensive editing on the data. These steps are well documented by the staff. We feel the editing process is reasonable and appropriate, and we found it consistent with our process.
- ❑ **Grouping:** Members with similar characteristics are combined during the active data processing (retiree data is not combined). This is an acceptable approach, used by other actuaries dealing with large amounts of data. The grouping approach significantly reduces the number of records processed in the valuation; the result is a large reduction in the time required to run the valuation.

The only possible drawback is that some characteristics of a specific individual may be lost. For example, the OSA does not identify members with dual service. However, for this valuation, we do not believe there is a material loss of accuracy due to this approach. Given the short turnaround that is sometimes required for legislative analysis, the OSA's preference is to retain the grouping approach. We agree that this is reasonable.

- ❑ **Parallel Data Processing:** We performed independent edits on the raw data and then compared our results with the valuation data used by OSA. Although our editing process was not as extensive as that performed by OSA staff for this valuation, we found our results to be consistent. A summary of this is shown in Exhibit 3-1. Note that the "Milliman" column reflects the DRS data after adjustments by Milliman. The "OSA" column reflects the actual data used in the OSA valuation.

The data processing done by the OSA staff appears to be thorough and accurate. We do not recommend any changes to the current procedures.



**LEOFF Plan 2 Retirement Board
Actuarial Audit Report**

**Exhibit 3-1
Member Statistics**

	Ratio		
	OSA	Milliman	OSA / Milliman
Active Members			
Number	14,560	14,560	100.0%
Total Salary (Millions)	\$967	\$964	100.3%
Average Age	39.5	39.5	99.9%
Average Service	10.7	10.7	99.8%
Average Salary	\$66,388	\$66,221	100.3%
Terminated Members			
Number Vested	439	444	98.9%
Number Non-Vested	1,359	1,361	99.9%
Retirees			
Number	316	317	99.7%
Average Monthly Benefit	\$1,341	\$1,340	100.0%



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**Section 4
Actuarial Value of Assets**

Audit Conclusions

We have confirmed that the actuarial value of the assets calculated for the September 30, 2003 valuation is accurate. We also found the methodology to be reasonable and in compliance with actuarial standards of practice, although the current method is uncommon.

Comments

We reviewed each of the worksheets and emails that supplied the asset information to the OSA staff and then followed the procedures used to calculate the market value of assets for each plan as of September 30, 2003. The OSA then uses the market values and the actuarial asset method to determine the actuarial value of the assets which is then used to determine both the funding status of each plan and the proposed contribution rates.

Like many retirement systems, LEOFF 2 uses an actuarial value of assets different from market value in order to smooth the effects of short-term volatility in market value. What makes the current method rather uncommon is that the smoothing period varies based on the market rate of return. The following schedule is used to determine the smoothing period:

Annual Gain/Loss		
Rate of Return	Smoothing Period	Annual Recognition
15% and up	8 years	12.50%
14-15%	7 years	14.29%
13-14%	6 years	16.67%
12-13%	5 years	20.00%
11-12%	4 years	25.00%
10-11%	3 years	33.33%
9-10%	2 years	50.00%
7-9%	1 year	100.00%
6-7%	2 years	50.00%
5-6%	3 years	33.33%
4-5%	4 years	25.00%
3-4%	5 years	20.00%
2-3%	6 years	16.67%
1-2%	7 years	14.29%
1% and lower	8 years	12.50%

Please note that the expected rate of return is 8%. The more that the actual return deviates from the expected return, the longer the smoothing period and the longer before the gain or loss is fully recognized in the actuarial value of assets. Due to the symmetry about the expected return on assets, the method does not systematically bias toward understatement or overstatement relative to market value. The lack of bias is essential for compliance with the proposed actuarial standards of practice governing the valuation of assets.

LEOFF Plan 2 Retirement Board Actuarial Audit Report

From October 1, 2002 through September 30, 2003, the assets had a market value rate of return of 15.13%, and thus this gain will be amortized over eight years in compliance with the above schedule. The previous year had a negative market value return and that loss will be amortized over eight years, since the return was less than 1%.

When a smoothing method is applied, the actuarial value of assets will deviate from the market value of assets. Many systems apply a corridor; that is, the actuarial value of assets is not allowed to deviate from the market value by more than a certain percentage. The purpose of a corridor is to keep the actuarial value of assets within a reasonable range of the market value. The current LEOFF 2 asset method has a corridor of 30%. Since the actuarial value and market value are within 30% of each other, the corridor does not currently apply. We agree that using a corridor is appropriate, although we would note that a corridor of 20% is more commonly used.

The OSA is in an unusual situation compared to most other actuaries in that the financial and asset information must be first compiled by their staff before an analysis for actuarial valuation purposes can be performed. This is because the audited financial statements are as of June 30, whereas the valuation is as of September 30.

The OSA had difficulties in the past in gathering the asset data and computing consistent rates of return on the investments compared to those that are reported by the SIB. Therefore, their procedure for determining the asset gain or loss for each valuation period is based on the cash flow of the funds in the SIB and the rate of return the SIB calculates on this basis. The OSA then used those calculations to compute the expected returns at the assumed 8.0% valuation rate and the difference is the gain or loss. Again, this is somewhat unusual, but we feel it is quite reasonable given the information available. However, it can lead to small differences in the rates of return than if full asset information were used (i.e., if items not currently held by SIB were included, such as payables reported by DRS and assets held by Treasury). Since the smoothing period is dependent on the rate of return, small changes in timing may have a larger impact on the calculated actuarial value of assets.

We have confirmed that the actuarial value of the assets calculated for the September 30, 2003 valuations was accurate and reasonable, based on the comments stated above.



Section 5 Actuarial Liabilities

Audit Conclusions

One purpose of this actuarial review is to verify the benefits and liabilities. We independently calculated the total liabilities of LEOFF 2. We found that the benefit provisions of LEOFF 2 were accounted for in an accurate manner, the actuarial assumptions and methods are being applied correctly, and that our total liabilities matched those calculated by the OSA within a reasonable level of tolerance.

Comments

We independently calculated the liabilities for all members in LEOFF 2 based on the following:

- ✓ **Data** – We used the same valuation data used by the OSA. As discussed in Section 3, we first confirmed that this data was consistent with the data provided by DRS.
- ✓ **Assumptions** – We used the assumptions disclosed in the 2002 actuarial valuation report.
- ✓ **Methods** – We used the actuarial methods disclosed in the 2002 actuarial valuation report.
- ✓ **Sample Lives** – The OSA provided us with detailed calculations for a number of individuals that are produced by their valuation system. This allowed us to analyze the components of the calculations for each benefit type (withdrawal, service retirement, disability, etc.) and verify that the assumptions and methods were being applied correctly.
- ✓ **Benefits** – We incorporated the benefits for LEOFF Plan 2. We obtained this information from the member handbook and the relevant law (RCW 41.26).

During our work, we noted a minor issue with the calculation of the liability for future vested terminations. We discussed this with the OSA, and they incorporated our recommendation in their valuation. The resulting change was not material (less than 0.1%).

The following exhibit shows a comparison of the valuation results for the two parallel valuations. The total liabilities differ by less than 1%. (Note that there will always be differences in liabilities when different software is used.) Based on these results, we feel that the OSA staff is valuing all provisions of LEOFF Plan 2 in an accurate manner.



**LEOFF Plan 2 Retirement Board
Actuarial Audit Report**

**Exhibit 5-1
Present Value of Fully Projected Benefits**

	LEOFF Plan 2		
	OSA	Milliman	OSA / Milliman Ratio
Active Members			
Retirement	\$ 4,019.8	\$ 4,003.4	100.4%
Termination	164.5	163.4	100.7%
Death	48.8	48.6	100.4%
Disability	4.6	4.6	100.0%
Portability	4.2	4.1	100.7%
Total Active	\$ 4,242	\$ 4,224	100.4%
Annual Salary	\$ 967	\$ 967	100.0%
PV Future Salaries	\$ 11,907	\$ 11,901	100.0%
Inactive Members			
Terminated	\$ 66.7	\$ 64.0	104.2%
Service Retired	62.3	62.0	100.5%
Disability Retired	5.7	5.7	100.0%
Survivors	2.5	2.5	100.0%
Total Inactive	\$ 137	\$ 134	102.2%
All LEOFF 2 Members	\$ 4,379	\$ 4,358	100.5%



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Section 6 Funding

Audit Conclusions

We reviewed the application of the funding method and find it is reasonable and that it meets generally accepted actuarial standards. Based on the plan's funding methods and assumptions, we believe the contribution rates are accurately calculated.

Comments

Contribution Rate

Our key findings on the calculated contribution rates are:

- ✓ Based on the assets and liabilities, we found the contribution rates calculated by OSA, effective for the 2005-07 biennium (if adopted), to be accurate:
 - Employee: 7.20%
 - Employer: 4.32%
 - State: 2.88%
- ✓ They finance LEOFF's liabilities over the working lifetime of the current members in a reasonable fashion.
- ✓ They follow state law.
- ✓ LEOFF Plan 1 does not have a positive UAAL, so no contributions from LEOFF Plan 2 are necessary to fund the LEOFF Plan 1 benefits.

We reviewed the calculation of each System's contribution rates provided by OSA. We first verified that the liabilities generated by the OSA valuation system were properly input into the calculation worksheet, including the actuarial and market values of the assets. We then reviewed the methodology used to determine the contribution rates. We found that the funding formulas were appropriate, and the final contribution rates were calculated correctly.

The following provides comments on some of the funding aspects of LEOFF 2.

State Law: The calculation of the contribution rates is consistent with the actuarial funding of the State Retirement Systems mandated in Chapter 41.45 of the RCW.

Key details include:

- The LEOFF Plan 2 Retirement Board will adopt employer (and state) contribution rates which are the level percent of pay needed to: (41.45.0604)
 - Fully amortize the total costs for LEOFF Plan 1 by June 30, 2024 [41.45.060(3)(a)]
 - Continue to fully fund LEOFF Plan 2 [41.45.060(3)(b)]



LEOFF Plan 2 Retirement Board Actuarial Audit Report

- ❑ The aggregate actuarial cost method is used to calculate the LEOFF Plan 2 employer contribution rates. [41.45.060(4)]
- ❑ 30% of the cost of LEOFF Plan 2 will be paid by employers and 20% by the State [41.45.060(3)(c)]. 50% of the cost of LEOFF Plan 2 will be paid by members [41.45.061(5)].

Washington State Cost Method: The cost method creates level employer contribution rates for members of both LEOFF Plans 1 & 2. A non-standard variation of the aggregate cost method is used to achieve this goal. Contribution rates for LEOFF are determined as follows:

1. The normal cost rate is calculated as the level percent of all future plan 2 salaries required to finance:
 - (a) the present value of all plan 2 benefits for current members
 - (b) less the plan 2 actuarial assets.
2. The unfunded actuarial accrued liability (UAAL) is calculated as:
 - (a) the present value of all plan 1 benefits
 - (b) less the plan 1 actuarial assets
 - (c) less the present value of plan 1 future normal cost rate contributions which are equal to plan 1 salaries times the sum of (i) the employer paid half of the normal cost rate described for plan 2 in item 1 above and (ii) the Plan 1 employee contribution rate (currently 0%, since there is no UAAL).
3. The UAAL rate is calculated as the level percent of all future plan 1 & 2 salaries through June 30, 2024 required to finance the UAAL for LEOFF Plan 1. The UAAL is negative as of September 30, 2003; therefore, no contributions are required.

Employer Contribution Rates: Employers (local and state) contribute half of the normal cost rate (i.e., the annual cost of member benefits as a percentage of salary) and all of the UAAL rate, if positive.

Member Contribution Rates: Half of the normal cost rate.

Adjustments for Legislation: Note that some changes in liabilities due to recent legislation are not reflected in the liabilities used in this calculation. However, the contribution impact, as determined in the accompanying fiscal note to the legislation, is added to the calculated contribution rate. The changes due to the legislation will be reflected in the calculated liabilities in the subsequent valuation.



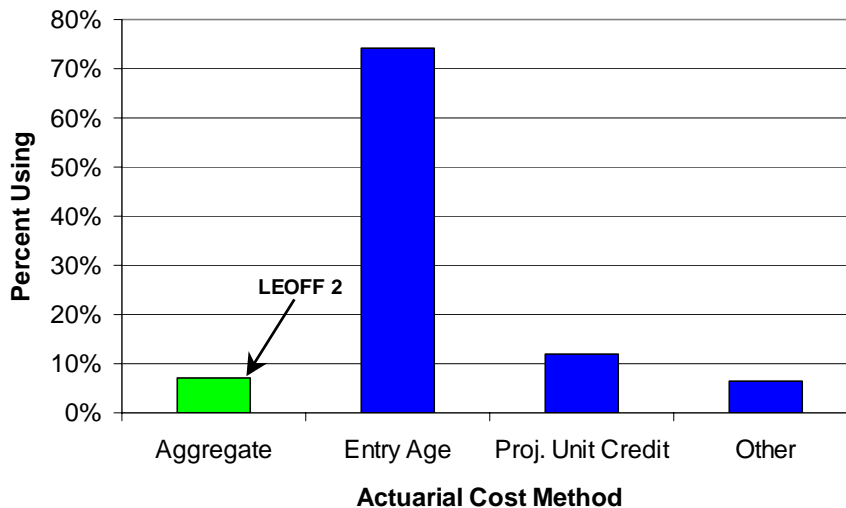
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Cost Method

Purpose of a Cost Method: The purpose of any cost method is to allocate the cost of future benefits to specific time periods. Most public plans follow one of a group of generally accepted funding methods, which allocate the cost over the members' working years. In this way benefits are financed during the time in which services are provided.

Most Common Public Plan Cost Method (Entry Age): The most common cost method used by public plans is the Entry Age Actuarial Cost Method. The focus of the Entry Age cost method is the level allocation of costs over the member's working lifetime. For a public plan this means current taxpayers pay their fair share of the pensions of the public employees who are currently providing services. Current taxpayers are not expected to pay for services received by a past generation, nor are they expected to pay for the services that will be received by a future generation. The cost method does not anticipate increases or decreases in allocated costs. Although less common, the aggregate cost method is a reasonable method to fund a retirement system.

The 2003 Public Funds Survey shows that about 7% of statewide systems are using the aggregate funding method, as illustrated in the graph below. The Entry Age cost method is by far the most common.



Appropriate Funding Level

The Government Accounting Standards Board (GASB) provides general guidelines on the appropriate funding of a public retirement system. In general, it expects each system to receive contributions equal to the normal cost plus an amortization payment for the UAAL or surplus.



LEOFF Plan 2 Retirement Board Actuarial Audit Report

The payment on a positive UAAL amount should be at least equal to a 30-year amortization payment. Under the aggregate funding method, liabilities are amortized over the average expected work life of all members. Generally, this results in an amortization period of about 15 years, well below the GASB minimum requirement.

LEOFF Plan 2 has a 124.9% funding ratio as of September 30, 2003 based on service to date. That is, the actuarial value of assets exceeds the present value of its credited projected benefits (benefits based on current service and projected salary) by about 25%. The funding ratio does not take into account the deferred asset losses. If these were reflected, the funding ratio would be less, but still well above 100%. Relative to most other public plans, LEOFF Plan 2 is very well-funded. As a comparison, the 2003 Public Funds Survey shows that state-wide systems on average have a funding ratio of about 90%.



**Section 7
Assumptions**

Actuarial Assumptions

Audit Conclusion

The review of actuarial assumptions is beyond the scope of this audit. The current set of assumptions was reviewed two years ago. At that time, we concluded that the assumptions were “reasonable and appropriate” to use in the actuarial valuation.

Comment

It should be noted that certain assumptions used for funding purposes and calculating the contribution rates do not comply with the GASB parameters for determining the disclosure information. The OSA makes the appropriate changes in assumptions to determine the appropriate accounting information.



Section 8 Summary of Recommendations & Considerations

Recommendations

We are not recommending any changes to the valuation.

Considerations

There is one area where a change might be considered in the future.

- ✓ **Assets:** As discussed in Section 4 of this report, one aspect of the work the OSA does to prepare the actuarial valuation is compiling all the asset information from several sources. This is because the regular audited financial statements are created as of June 30, the State's fiscal year end. However, the valuation results are as of September 30.

In addition, the rate of return on the assets is based solely on the assets held by the SIB. While this represents the vast majority of the assets for the plan, small differences in the return rate can result in a slightly different smoothing period in determining the actuarial value of assets, which can impact the contribution rates. If the valuation date was the same as the fiscal year end, both of these issues would be addressed. We realize there are reasons for the current procedures; however, it would be preferable to have audited financial statements consistent with the valuation date.

