

**Pension Funding Council
Actuarial Audit Report**

Prepared for September, 2004 Meeting

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September 17, 2004

Pension Funding Council
c/o Ms. Jane Sakson
Office of Financial Management
P.O. Box 43113
Olympia, WA 98504-3113

Dear Ms. Sakson:

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.



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 Pension Funding Council.

Sincerely,

A handwritten signature in black ink that reads "Karen I. Steffen".

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

A handwritten signature in black ink that reads "Nick Collier".

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 valuations performed by the Office of the State Actuary (OSA) which set the contribution rates for adoption by the Pension Funding Council. The purpose of the audit 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.

The following plans are included in this audit. Note that LEOFF Plan 2 has a separate retirement Board; therefore, a separate audit and report are being completed for this plan.

- PERS Plans 1, 2 & 3
- TRS Plans 1, 2 & 3
- SERS Plans 2 & 3
- LEOFF Plan 1
- WSP Plans 1 & 2

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 valuations for the State of Washington retirement systems were 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:** We independently calculated the total liabilities of the Washington State retirement systems. We found that the benefit provisions of all plans 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.
- ❑ **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 systems' 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.
- ❑ **Gain-Sharing:** The OSA uses a reduction in the expected investment return to account for the estimated value of future gain-sharing payments. We agree that this is an appropriate method to value gain-sharing. We also found that the reduction amount (0.40%) used by the OSA is reasonable.
- ❑ **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 at this time. There is one area where a change might be considered in the future.
 - ✓ **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 Conclusion

The September 30, 2003 actuarial valuation for the Washington State retirement systems 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.

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- ✓ 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.



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Section 3 Membership Data

Audit Conclusion

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 very consistent. A summary of all plans in aggregate 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. A detailed analysis by plan is shown in Appendix A.

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



**Exhibit 3-1
Member Statistics**

	Ratio		
	OSA	Milliman	OSA / Milliman
Active Members			
Number	271,909	271,904	100.0%
Total Salary (Millions)	\$11,559	\$11,541	100.2%
Average Age	45.6	45.6	100.0%
Average Service	10.3	10.3	100.0%
Average Salary	\$42,512	\$42,446	100.2%
Terminated Members			
Number Vested	30,155	30,150	100.0%
Number Non-Vested	94,659	94,659	100.0%
Retirees			
Number	110,390	110,435	100.0%
Average Monthly Benefit	\$1,385	\$1,385	100.0%



Section 4 Actuarial Value of Assets

Audit Conclusion

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 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, Washington State 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%



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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.

From October 1, 2002 through September 30, 2003, the assets for most plans had a market value rate of return of just over 15%, and thus these gains are amortized over eight years in compliance with the above schedule. Note that the two most mature plans (PERS 1 and TRS 1) had returns for the year of just under 15%, and these gains are being amortized over seven years. The previous year had a market value return of less than 1% for all plans, and that loss is being amortized over eight years.

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 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, such as payables reported by DRS and assets held by Treasury, were included). 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 Conclusion

We independently calculated the total liabilities of the Washington State retirement systems. We found that the benefit provisions of all plans 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 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 all plans into our valuation system. We obtained this information from the member handbooks and the relevant law.

During our work, we noticed a few minor issues with the liability calculations. We discussed these with the OSA, and they incorporated our recommendation in their valuation. None of the resulting changes were material.

We did a detailed comparison by plan and type of benefit for the liabilities computed in our parallel valuation with those calculated by the OSA. Exhibit 5-1 shows a summary of this analysis for the two parallel valuations. The total liabilities are within approximately 1% for all plans. (Note that there will always be differences in liabilities when different software is used.) A more detailed comparison is shown in Appendix B. Based on these results, we feel that the OSA staff is valuing all provisions in an accurate manner.

**Exhibit 5-1
Comparison of Liabilities**

(Dollar Amounts in Millions)

Present Value of Fully Projected Benefits*

Plan	OSA	Milliman	OSA / Milliman Ratio
PERS 1	\$ 13,219	\$ 13,318	99.3%
PERS 2 & 3	14,278	14,188	100.6%
TRS 1	10,767	10,769	100.0%
TRS 2 & 3	5,220	5,280	98.9%
SERS 2 & 3	2,137	2,132	100.3%
LEOFF 1	4,341	4,326	100.3%
WSP 1	722	725	99.5%
WSP 2	5	5	100.0%
All Members	\$ 50,690	\$ 50,744	99.9%

Present Value of Future Salaries

Plan	OSA	Milliman	OSA / Milliman Ratio
PERS 1	\$ 4,224	\$ 4,062	104.0%
PERS 2 & 3	58,979	59,149	99.7%
TRS 1	2,996	3,122	96.0%
TRS 2 & 3	33,689	33,438	100.7%
SERS 2 & 3	10,274	10,153	101.2%
LEOFF 1	234	234	100.1%
WSP 1	757	755	100.2%
WSP 2	31	31	100.0%
All Members	\$ 111,184	\$ 110,945	100.2%

* Reflects the estimated value of future gain-sharing benefits.

Section 6 Funding

Audit Conclusion

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

Comments

Contribution Rates

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:

	System	Employer	Plan 2 Member
▪	PERS	5.73%	3.38%
▪	TRS	6.74%	2.48%
▪	SERS	7.56%	3.51%
▪	LEOFF 1	0.00%	N/A
▪	WSP	4.51%	4.51%

- ✓ They finance the system's liabilities using a modified aggregate cost method which funds benefits over the working lifetime of the current members in a reasonable fashion.
- ✓ They follow state law.
- ✓ They include the value of future potential gain-sharing benefits.

Different contribution rates are calculated for each system. The employer contribution rates within each system are level for members of all plans within a system.

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.



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The following provides comments on some of the funding aspects of the Washington State retirement systems.

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 OSA calculates employer (and state) contribution rates which are the level percent of pay needed to:
 - ✓ Fully amortize the total costs for PERS, TRS, and LEOFF Plan 1 by June 30, 2024
 - ✓ Continue to fully fund plans 2 & 3 for PERS, TRS, SERS and Plans 1 & 2 for WSP
- ❑ The aggregate actuarial cost method is used to calculate the combined Plans 2 & 3 employer contribution rates for PERS, TRS, & SERS. For WSP, Plans 1 & 2 are combined.
- ❑ The PERS, TRS & SERS Plan 2 member rates will not increase as a result of gain-sharing amounts distributed to Plan 3 members.

Washington State Cost Method: The cost method creates level employer contribution rates for each plan in PERS, TRS, & LEOFF. This is designed to pay off the unfunded liabilities of the closed-off Plan 1 for each system. A non-standard variation of the aggregate cost method is used to achieve this goal. Contribution rates are determined as follows:

1. The normal cost rate is calculated as the level percent of all future plan 2 & 3 salaries required to finance:
 - (a) the present value of the combined plan 2 & 3 benefits for current members
 - (b) less the combined plan 2 & 3 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.
3. The UAAL rate is calculated as the level percent of all future plan 1, 2 & 3 salaries through June 30, 2024 required to finance the UAAL for Plan 1. Note that the SERS salaries are included with the PERS salaries to pay off the PERS 1 UAAL. The UAAL is



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negative for LEOFF 1 as of September 30, 2003; therefore, no UAAL contributions are required for this plan.

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. Please see exceptions noted below.

Member Contribution Rates: With the exceptions noted below, members contribute as follows:

- ✓ Plan 1 members contribute 6% of pay,
- ✓ Plan 2 members contribute half the normal cost rate (minimum and maximum rates apply in some cases), and
- ✓ Plan 3 member contributions go into their defined contribution accounts.

Law Enforcement Officers and Fire Fighters Plan 1: The actuarial assets of LEOFF Plan 1 exceed the present value of all future benefits as of September 30, 2003. Since there is no UAAL, the LEOFF Plan 1 members and employers currently contribute 0% of pay.

Gain-Sharing: Consistent with the RCW, the PERS, TRS & SERS Plan 2 member rate have been calculated so that they are not increased by the gain-sharing amounts distributed to Plan 3 members. See Section 8 for more details.

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.

Cost Method

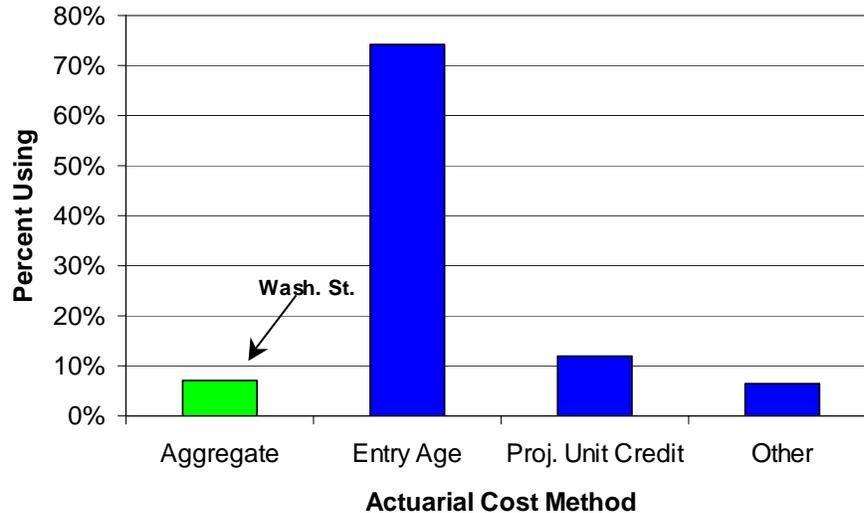
Purpose of a Cost Method: The purpose of any cost method is to allocate the cost of future benefits to specific time periods. Most public plans follow one of a group of generally accepted funding methods, which allocate the cost over the members' working years. In this way benefits are financed during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



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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 of either the UAAL or surplus amount.

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.

In aggregate, the Washington State retirement systems have a funding ratio of 110% 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 10%. The funding ratio does not take into account the deferred asset losses. Relative to most other public plans, the systems in aggregate are well-funded. As a comparison, the 2003 Public Funds Survey shows that statewide systems on average have a funding ratio of about 90%.

Section 7 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.

Comments

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 **Gain-Sharing**

Audit Conclusion

The OSA uses a reduction in the expected investment return to account for the estimated value of future gain-sharing payments. We agree that this is an appropriate method to value gain-sharing. We also found that the reduction amount (0.40%) used by the OSA is reasonable.

Comments

Gain-Sharing Provisions

The gain-sharing provisions increase member benefits in periods of “extraordinary investments gains”. These are periods in which the compound four-year average investment return exceeds 10%. The amount used for gain-sharing is one-half of the sum of the returns in excess of 10% multiplied by the portion of members eligible for gain-sharing (based on service credit). The gain-sharing is applied in even-numbered years as follows:

- ✓ **PERS 1 & TRS 1 (RCW 41.31):** The gain-sharing amount is used to increase the annual increase component of the Uniform COLA. Currently, about 1/3rd of the annual increase is attributable to gain-sharing.
- ✓ **PERS, TRS & SERS Plan 3 (RCW 41.31A):** A fixed-dollar amount based on years of credited service is distributed into members’ defined contributions accounts.
- ✓ **PERS, TRS & SERS Plan 2, LEOFF 1 & 2, and WSP 1 & 2:** No gain-sharing.

OSA Approach

As explained in greater detail below, gain-sharing results in lower expected investment returns for the funds set aside to pay benefits, since some of the investment earnings will be distributed to members through the gain-sharing provisions. For this reason, the OSA determined an interest rate adjustment to reflect the lower expected returns. This adjustment was based upon calculations for the expected asset returns provided by the Washington State Investment Board.

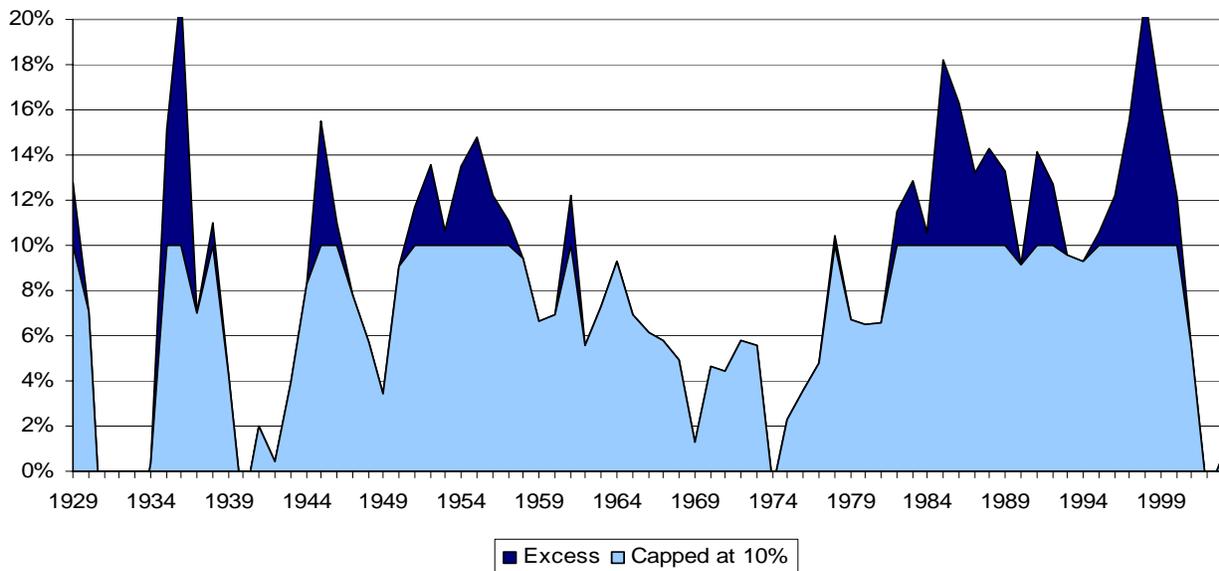
The OSA determined the value of the gain-sharing provisions as the difference between the value of “regular” benefits (the benefits expected to be paid to members outside of gain-sharing benefits) discounted at the two interest rates: 1) the expected return without the gain-sharing provisions; and, 2) the expected return after the adjustment for gain-sharing. The OSA reflected the fact that the gain-sharing benefits are only payable in even-numbered years and are not payable to members in every plan. The OSA’s calculations do not affect member rates, because as specified in RCW 41.45.061 (6), the gain-sharing provisions do not affect member contribution rates. Only the employer rates increase, since employers are responsible for the entire cost of these provisions.

Is this Approach Reasonable?

Since the investment return assumption of 8% is less than the threshold of 10%, a standard actuarial valuation would not project gain-sharing to occur, because the standard actuarial valuation takes a deterministic approach with a single fixed rate assumption. However, the 8% is a long-term assumption that reflects that some years the return will be less than the assumptions and some years it will be greater. In those years where the four-year average of investment returns exceeds 10%, benefits to members will be increased. Thus, gain-sharing increases the present value of benefits that members are expected to receive. Because the gain-sharing program systematically provides for the possibility of additional benefits to members, it must have an impact on plan assets over time. From an actuarial perspective, there are several ways to reflect this. We feel that lowering the interest rate assumption to value liabilities is an appropriate method to value gain-sharing.

If the fund is expected to earn 8.0% over the long term, the use of excess returns (over the 10% threshold) for purposes other than funding the regular pension benefits will impact the long-term assumption, as shown in the following graph. Based on historical data, we have shown the investment return for a fund which averaged 8.0% over that time. If this were the case for the Washington systems, the dark area (returns in excess of 10%) would be diverted to fund the gain-sharing benefits. As a result, only the light area would be available to fund the regular pension benefits. Since the excess returns would no longer be available to offset the impact of the poor returns, the overall return will be lower. Note that since gain-sharing only occurs every other year and only one-half is used, only one-fourth of the excess returns would be used for the plans that have gain-sharing and it would be in proportion to the service credit for eligible employees for those plans.

**Historical Investment Returns
4-Year Average on Market**



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Based on our analysis we found the 0.40% additional investment return reasonably approximates the value of expected future gain-sharing benefits. We also agree that lowering the interest rate assumption to value liabilities is an appropriate method to value gain-sharing. Note that the full 8% investment return assumption is still used for items such as valuing the present value of future salaries and determining the expected return on assets.



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Section 9 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 sometime 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.

**Appendix A
Detailed Data Summary**

PERS

	OSA Summary			Milliman Summary			Ratio OSA / Milliman		
	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3
Active Members									
Number	19,740	117,262	17,548	19,738	117,262	17,548	100.0%	100.0%	100.0%
Total Salary (Millions)	\$945	\$5,143	\$787	\$945	\$5,137	\$784	100.0%	100.1%	100.3%
Average Age	55.2	44.6	42.2	55.2	44.6	42.1	100.0%	99.9%	100.1%
Average Service	21.5	9.0	8.5	21.4	9.0	8.5	100.4%	100.4%	100.3%
Average Salary	\$47,876	\$43,855	\$44,823	\$47,889	\$43,804	\$44,679	100.0%	100.1%	100.3%
Terminated Members									
Number Vested	3,142	16,089	770	3,141	16,081	770	100.0%	100.0%	100.0%
Number Non-Vested	6,525	78,853	0	6,525	78,853	0	100.0%	100.0%	100.0%
Retirees									
Number	54,372	10,904	86	54,386	10,908	86	100.0%	100.0%	100.0%
Avg. Monthly Benefit	\$1,249	\$618	\$406	\$1,249	\$617	\$406	100.0%	100.1%	100.0%

TRS

	OSA Summary			Milliman Summary			Ratio OSA / Milliman		
	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3
Active Members									
Number	11,175	7,637	47,263	11,172	7,637	47,262	100.0%	100.0%	100.0%
Total Salary (Millions)	\$692	\$415	\$2,308	\$691	\$415	\$2,302	100.2%	100.1%	100.2%
Average Age	55.4	49.3	41.1	55.4	49.3	41.1	100.1%	99.9%	99.9%
Average Service	24.0	12.1	8.3	23.9	12.1	8.4	100.4%	100.1%	99.2%
Average Salary	\$61,954	\$54,333	\$48,836	\$61,865	\$54,292	\$48,718	100.1%	100.1%	100.2%
Terminated Members									
Number Vested	1,647	2,493	2,418	1,648	2,493	2,420	99.9%	100.0%	99.9%
Number Non-Vested	776	4,169	0	776	4,169	0	100.0%	100.0%	100.0%
Retirees									
Number	33,855	957	385	33,880	958	386	99.9%	99.9%	99.7%
Avg. Monthly Benefit	\$1,539	\$941	\$407	\$1,538	\$941	\$406	100.0%	100.0%	100.2%



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SERS

	OSA Summary			Milliman Summary			Ratio OSA / Milliman		
	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3
Active Members									
Number		21,504	27,710		21,505	27,710		100.0%	100.0%
Total Salary (Millions)		\$494	\$639		\$494	\$636		100.0%	100.5%
Average Age		48.3	45.8		48.3	45.8		100.0%	100.1%
Average Service		8.6	7.2		8.6	7.1		99.7%	100.8%
Average Salary		\$22,967	\$23,051		\$22,965	\$22,942		100.0%	100.5%
Terminated Members									
Number Vested		1,902	1,648		1,903	1,648		99.9%	100.0%
Number Non-Vested		4,232	0		4,232	0		100.0%	100.0%
Retirees									
Number		736	306		736	306		100.0%	100.0%
Avg. Monthly Benefit		\$518	\$231		\$518	\$231		100.0%	100.0%

LEOFF 1

	OSA Summary			Milliman Summary			Ratio OSA / Milliman		
	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3
Active Members									
Number	991			991			100.0%		
Total Salary (Millions)	\$71			\$71			99.8%		
Average Age	54.0			54.0			100.0%		
Average Service	29.3			29.3			100.1%		
Average Salary	\$71,924			\$72,062			99.8%		
Terminated Members									
Number Vested	14			14			100.0%		
Number Non-Vested	84			84			100.0%		
Retirees									
Number	8,054			8,054			100.0%		
Avg. Monthly Benefit	\$2,796			\$2,796			100.0%		



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**Pension Funding Council
Actuarial Audit Report**

WSP

	OSA Summary			Milliman Summary			Ratio OSA / Milliman		
	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3	Plan 1	Plan 2	Plan 3
Active Members									
Number	1,045	34		1,045	34		100.0%	100.0%	
Total Salary (Millions)	\$65	\$1		\$65	\$1		99.9%	100.0%	
Average Age	38.8	28.8		38.8	28.8		100.1%	100.1%	
Average Service	12.2	0.8		12.2	0.8		100.3%	100.1%	
Average Salary	\$61,848	\$41,019		\$61,905	\$41,020		99.9%	100.0%	
Terminated Members									
Number Vested	32	0		32	0		100.0%	100.0%	
Number Non-Vested	20	0		20	0		100.0%	100.0%	
Disabled Members	61			61			100.0%		
Retirees									
Number	735	0		735			100.0%		
Average Monthly Benefit	\$2,884			\$2,884			100.0%		



**Appendix B
Detailed Comparison of Liabilities**
(Dollar Amounts in Millions)

	PERS Plan 1			PERS Plans 2 & 3		
	OSA	Milliman	Ratio	OSA	Milliman	Ratio
Active Members						
Retirement	\$ 4,343.2	\$ 4,388.1	99.0%	\$ 11,607.3	\$ 11,517.4	100.8%
Termination	45.7	46.0	99.3%	713.7	718.9	99.3%
Death	64.2	62.1	103.4%	240.9	241.9	99.6%
Disability	35.5	35.3	100.6%	97.6	103.6	94.2%
Portability	9.2	9.4	97.9%	38.1	38.0	100.3%
Uniform COLA	393.9	401.5	98.1%	-	-	100.0%
Total Active	\$ 4,892	\$ 4,942	99.0%	\$ 12,698	\$ 12,620	100.6%
Annual Salary	\$ 945	\$ 945	100.0%	\$ 5,929	\$ 5,929	100.0%
PV Fut. Salaries	\$ 4,224	\$ 4,062	104.0%	\$ 58,979	\$ 59,149	99.7%
Inactive Members						
Terminated	\$ 253.6	\$ 259.5	97.7%	\$ 717.3	\$ 708.3	101.3%
Service Retired	6,650.2	6,649.9	100.0%	781.5	778.1	100.4%
Disability Retired	111.2	109.8	101.3%	47.5	47.5	100.0%
Survivors	378.3	381.1	99.3%	34.1	34.3	99.4%
Uniform COLA	934.2	975.0	95.8%	-	-	100.0%
Total Inactive	\$ 8,328	\$ 8,375	99.4%	\$ 1,580	\$ 1,568	100.8%
All PERS Members	\$ 13,219	\$ 13,318	99.3%	\$ 14,278	\$ 14,188	100.6%

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	TRS Plan 1			TRS Plans 2 & 3		
	OSA	Milliman	Ratio	OSA	Milliman	Ratio
Active Members						
Retirement	\$ 3,461.1	\$ 3,470.4	99.7%	\$ 4,642.2	\$ 4,714.0	98.5%
Termination	18.2	18.3	99.5%	136.0	128.5	105.8%
Death	35.9	35.5	101.1%	67.5	68.0	99.3%
Disability	10.0	10.0	100.0%	5.1	5.1	100.0%
Portability	11.0	11.1	99.1%	5.0	5.0	100.0%
Uniform COLA	301.5	288.8	104.4%	-	-	100.0%
Total Active	\$ 3,838	\$ 3,834	100.1%	\$ 4,856	\$ 4,921	98.7%
Annual Salary	\$ 692	\$ 692	100.0%	\$ 2,723	\$ 2,723	100.0%
PV Fut. Salaries	\$ 2,996	\$ 3,122	96.0%	\$ 33,689	\$ 33,438	100.7%
Inactive Members						
Terminated	\$ 209.8	\$ 203.4	103.1%	\$ 208.2	\$ 204.4	101.9%
Service Retired	5,581.2	5,561.1	100.4%	147.1	146.1	100.7%
Disability Retired	95.4	96.6	98.8%	4.6	4.6	100.0%
Survivors	211.2	212.5	99.4%	4.4	4.5	97.8%
Uniform COLA	831.7	861.5	96.5%	-	-	100.0%
Total Inactive	\$ 6,929	\$ 6,935	99.9%	\$ 364	\$ 360	101.3%
All TRS Members	\$ 10,767	\$ 10,769	100.0%	\$ 5,220	\$ 5,280	98.9%

	SERS Plans 2 & 3		
	OSA	Milliman	Ratio
Active Members			
Retirement	\$ 1,787.6	\$ 1,788.4	100.0%
Termination	153.2	147.4	103.9%
Death	29.6	29.9	99.0%
Disability	11.4	12.1	94.2%
Portability	6.0	6.1	98.4%
Uniform COLA	-	-	100.0%
Total Active	\$ 1,988	\$ 1,984	100.2%
Annual Salary	\$ 1,133	\$ 1,133	100.0%
PV Fut. Salaries	\$ 10,274	\$ 10,153	101.2%
Inactive Members			
Terminated	\$ 81.8	\$ 80.8	101.2%
Service Retired	63.4	62.6	101.3%
Disability Retired	3.2	3.3	97.0%
Survivors	1.3	1.3	100.0%
Uniform COLA	-	-	100.0%
Total Inactive	\$ 150	\$ 148	101.1%
All SERS Members	\$ 2,137	\$ 2,132	100.3%



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Pension Funding Council Actuarial Audit Report

	LEOFF Plan 1		
	OSA	Milliman	Ratio
Active Members			
Retirement	\$ 408.7	\$ 408.4	100.1%
Termination	0.7	0.7	100.0%
Death	6.9	7.0	98.6%
Disability	206.7	204.2	101.2%
Portability	-	-	100.0%
Uniform COLA	-	-	100.0%
Total Active	\$ 623	\$ 620	100.4%
Annual Salary	\$ 71	\$ 71	100.0%
PV Fut. Salaries	\$ 234	\$ 234	100.1%
Inactive Members			
Terminated	\$ 8.3	\$ 8.4	98.8%
Service Retired	1,305.8	1,301.1	100.4%
Disability Retired	2,028.8	2,018.9	100.5%
Survivors	375.6	377.7	99.4%
Uniform COLA	-	-	100.0%
Total Inactive	\$ 3,718	\$ 3,706	100.3%
LEOFF 1 Members	\$ 4,341	\$ 4,326	100.3%

	WSP Plan 1			WSP Plan 2		
	OSA	Milliman	Ratio	OSA	Milliman	Ratio
Active Members						
Retirement	\$ 375.5	\$ 376.8	99.7%	\$ 5.0	\$ 4.8	103.8%
Termination	4.1	4.1	100.0%	0.2	0.2	100.0%
Death	6.5	6.4	101.6%	0.1	0.1	100.0%
Disability	0.3	0.3	100.0%	-	-	100.0%
Portability	-	-	100.0%	-	-	100.0%
Uniform COLA	-	-	100.0%	-	-	100.0%
Total Active	\$ 386	\$ 388	99.7%	\$ 5.3	\$ 5.1	103.5%
Annual Salary	\$ 65	\$ 65	100.0%	\$ 1	\$ 1	100.0%
PV Fut. Salaries	\$ 757	\$ 755	100.2%	\$ 31	\$ 31	100.0%
Inactive Members						
Terminated	\$ 2.8	\$ 2.8	100.0%	\$ -	\$ -	100.0%
Service Retired	314.4	316.3	99.4%	-	-	100.0%
Disability Retired	1.4	1.7	82.4%	-	-	100.0%
Survivors	16.8	16.9	99.4%	-	-	100.0%
Uniform COLA	-	-	100.0%	-	-	100.0%
Total Inactive	\$ 335	\$ 338	99.3%	\$ -	\$ -	100.0%
All WSP Members	\$ 722	\$ 725	99.5%	\$ 5.3	\$ 5.1	103.5%



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