Consulting
Retirement

Actuarial Audit Report

The University of California

University of California Retirement Plan

As of July 1, 2011

Introduction

We have completed our actuarial audit of the University of California (“UC” or “the University”) Retirement Plan (“UCRP” or the “Plan”). This work entailed a review of the data, valuation processes, and results generated by the Plan’s actuary as requested.

As demonstrated in the attached findings, we have matched actuarial calculations within an actuarially acceptable margin and have several related comments. None of the comments reflects a critical concern. We believe that the Plan’s actuary may want to consider making specific changes to the wording of their report, but once again, none of these are “critical” concerns. Our audit finds that actuarial calculations and results are reasonable, consistent and accurate, and that the presentation of the results is compliant with the standards of GASB 25 and 27.

To our knowledge, no colleague of Aon Hewitt[1] providing services to The University of California has any material direct or indirect financial interest in The University of California. Thus, we believe there is no relationship existing that might affect our capacity to prepare and certify this actuarial report for The University of California.

We look forward to presenting these findings to the University.

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Senior Vice President
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1 Aon Consulting, Inc. and Hewitt Associates LLC are operating as Aon Hewitt

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Section 1 – General Findings

University procedures, as well as good business practice, call for independent audits of the University's actuary to be conducted periodically. The engagement by UC Human Resources elaborated that the firm conducting the audit is to express an opinion regarding:

- The reasonability, consistency, and accuracy of the method, factors and assumptions used in the actuarial valuation,
- The reasonability, consistency, and accuracy of the compilation of the actuarial valuation.

The overall finding of this actuarial audit is that the July 1, 2011 valuation was performed by the Regent's consulting actuary, the Segal Company ("Segal") in a manner that is reasonable and consistent with generally accepted actuarial principles. The valuation presents a fair representation of the actuarial liabilities and develops contribution rates which are generally appropriate to satisfy the funding obligations of the University. We did not find any issues that rose to the level of serious concern.

Generally our audit comments will be one of the following:

- **Level of Serious Concern** – concluding that some part of the work may be incorrect, unreasonable, or inconsistent with generally accepted actuarial principles; or
- **Suggestions and Considerations** – suggesting changes or further analysis which might improve the actuarial estimates and add value and understanding to the actuarial work.

The following issues rise to the level of serious concern:

- There were no issues that rose to the level of serious concern.

The following are suggestions and considerations:

- There were no suggestions or considerations other than those covered in Sections 3 and 4. Those suggestions are all relatively minor and are generally items to review and confirm the current approach.

Aon Hewitt reviewed the Segal report entitled University of California Retirement Plan Actuarial Valuation Report as of July 1, 2011 dated October 24, 2011, as well as Segal's records of the University's active, inactive, and beneficiary data. Additionally, Aon Hewitt engaged in numerous phone conversations and email exchanges with both the University and Segal to confirm certain data and garner answers to questions during the preparation of this report. Below is an overview of our results:

The Aon Hewitt audit of the Plan first confirmed that the population utilized in the valuation is appropriate. Based on our review of electronic data, information provided to us regarding changes in the population, and conversations with representatives of the University of California Office of the President, we confirmed the reasonableness of the data utilized in the Segal valuation.

We then replicated the actuarial valuation conducted by Segal, and the Aon Hewitt results match those results within our materiality margin of error. For certain actuarial valuation purposes, the IRS specifies either a 5% or 2% threshold of materiality. We have applied the 2% threshold to confirm the appropriateness of the valuation's actuarial accrued liability calculation and normal cost calculation. Both these results are well within these standards.

The primary purpose of an actuarial audit is to confirm that there are no significant errors in the data or the actuarial calculations, or if there are, to identify them so that they can be addressed. Based on our replication of results, we report that we have found no significant discrepancies and conclude that there are no significant errors in the valuation of the Plan's liabilities.

The following table summarizes the valuation data and actuarial accrued liabilities produced by the Segal and Aon Hewitt actuarial valuations:

Summary of Valuation Data and Results

	(1) Aon Hewitt	**(2) Segal**	**(2) ÷ (1) % Delta**
Number of Participants			
Actives	115,559	115,568	0.008%
Retirees and Beneficiaries	117,257	117,199	(0.049%)
Total	232,816	232,767	(0.021%)
Actuarial Accrued Liability			
Members in Pay Status	$22,957,147	$22,989,856	0.142%
Terminated Members	4,587,531	4,557,847	(0.647%)
Active Members	24,082,431	24,283,603	0.835%
Total	$51,627,108	$51,831,306	0.396%
Normal Cost (Beginning of Year)	$ 1,340,448	$ 1,362,878	1.673%

Section 2 – Audit of Actuarial Method, Factors and Assumptions Used in Actuarial Valuation

The first step in the actuarial audit process is to review the actuarial methods, factors, and assumptions used in the valuation.

Actuarial Methods

Segal uses several actuarial methods in determining costs and liabilities for the University. For the University of California Retirement Plan ("UCRP"):

- The actuarial funding method is the Entry Age Normal actuarial cost method.
- The actuarial asset valuation method is a five-year smoothed market value.
- The amortization method under the Governmental Accounting Standards Board ("GASB") reporting is a level dollar, closed period.

Actuarial Funding Method

The Entry Age Normal actuarial cost method is used in the actuarial valuation for UCRP. The Entry Age Normal cost method is designed to maintain constant plan costs throughout each employee's career as a portion of pay. We believe this is a reasonable and appropriate method, and is used in many public plan valuations.

Actuarial Asset Valuation Method

Segal employs a five-year smoothed asset valuation methodology to determine the actuarial value of assets. Unlike actuarial funding methods, asset valuation methods are not precisely defined into a few standards. Many actuaries use what could be categorized as a "five-year smoothed asset valuation methodology" as does Segal, but different assumptions and methods within those specific methodologies would generate different results. We have reviewed the precise provisions of the methodology that Segal employs and find it to be reasonable, consistently applied, and accurate.

The Segal method, which spreads any investment gains or losses (relative to the actuarial assumptions) over five years, is a very conventional and appropriate application of the five-year smoothed method. Segal details on page ii of the valuation report the recognition of $885 million in net deferred losses that will be fully recognized over the next four plan years.

Amortization Method for GASB Determinations

The Governmental Accounting Standards Board has very specific minimum requirements for its amortization method. Under GASB, the total amortization payment must be sufficient to fully amortize the total unfunded liability over a period of no more than thirty years. Segal uses a different approach and then tests that the results of that alternative approach satisfy the GASB requirements. Segal and the University have elected to amortize any changes in the unfunded actuarial accrued liability ("UAAL") due to actuarial experience gains or losses over a fixed thirty-year period, and separately amortize gains and losses that arise due to a change in actuarial assumptions or plan provisions over a fixed fifteen-year period. The Segal calculations are reasonable, consistent with GASB requirements, and accurately utilized and communicated in the valuation report.

Actuarial Factors

In the process of conducting an actuarial valuation, actuaries generally use explicit methods to determine actuarial values. For example, they project potential benefit amounts to future dates and discount those benefits using various actuarial factors.

The factors which are used in the actuarial valuation and experience study process are:

- Administrative Expenses Load
- Sick Leave Load
- Cost Factors
- Conversion Factors

Administrative Expenses Load

Segal increases the Plan's normal cost by 0.50% of payroll to reflect plan expenses.

We have reviewed this load assumption and find that it was calculated in a manner consistent with the assumption. We can also note that the 0.50% factor falls within a range of reasonable estimates for administrative costs of a plan this size.

The administrative expenses load is applied directly to Segal's calculation of covered payroll for the current plan year. Segal's methodology for determining covered payroll is to annualize the University's actual payroll for the prior plan year, increase that by the assumed rate of salary growth, and then reduce this value by the total annual pay of those members expected to leave active status during the year. While we believe this is one reasonable approach to determine the covered payroll, it is our opinion that Segal may want to consider further increasing the covered payroll to include a portion of the annual pay of those members expected to leave active status during the year (the use of the existing termination and other assumptions might generate a reasonable assumption for this purpose), and could be more explicit and transparent with regard to the details of this calculation. Given the fact that the current methodology is fully disclosed, and that the impact of this change is not likely to be significant, we do not believe this potential change is required to be made or should be made without a further analysis of its potential cost versus benefits.

Sick Leave Load

For participants that retire from active membership and do not elect lump sum cash outs, the University credits an extra 0.13%, 1.45%, and 2.00% years of service for Faculty, Staff, and Safety members, respectively. We have reviewed this assumption and find it reasonable.

Cost Factors

Segal uses the Entry Age Normal actuarial cost method to determine actuarial cost factors which assign the liability to appropriate years. These “cost factors” are primarily based on the calculation of the Present Value of Benefits (PVB) and the Present Value of Salaries (PVS) and are a natural byproduct of the actuarial valuation process. We confirm that the PVB is being calculated correctly and that the methodology used for determining PVS is both reasonable and accurate.

Conversion Factors

Segal uses lump sum conversion factors as well as conversion factors for determining actuarial equivalence between single life annuities and joint and survivor annuities. We confirm that the calculations of these conversion factors are accurate.

Actuarial Assumptions

We have reviewed the actuarial assumptions used by the actuary and find them to be reasonable, consistent, and accurate.

The actuary uses a number of actuarial assumptions, including:

- Demographic Assumptions
  - Mortality
  - Mortality After Disability
  - Mortality Specific to Participants Electing Lump Sum Cash Outs
  - Withdrawal From Service Before Retirement
  - Retirement
  - Withdrawal of Contributions at Termination
  - Other Demographic Assumptions
- Economic Assumptions
  - Inflation
  - Investment Return Rate
  - Cost-of-Living Adjustment
  - Salary Increases

Brief comments on each assumption are included below and are discussed in more detail in the review of the University of California Retirement Plan experience study covering the period July 1, 2006 through June 30, 2010 ("UCRP Experience Study").

Demographic Assumptions

Mortality

We concur that the mortality rates used by Segal in valuing the Plan are reasonable, consistent and accurate. As we noted in our review of the UCRP Experience Study, we understand that Segal considered moving to a generational mortality table, but know of no large public plans that currently utilize one. Doing so would require that a number of issues be addressed that do not need to be addressed under the current table. A generational table would not provide significantly different results at this time. Due to the fact that the Plan is a large Public Sector plan, and the fact that the use of generational table would not necessarily generate materially different results at this time, the use of the RP-2000 Combined Healthy table projected with Scale AA to 2025 and a two year setback is acceptable.

Mortality After Disability

We concur that the post-retirement disability mortality rates used by Segal in valuing the Plan are reasonable, consistent and accurate. As with the general mortality assumption, we believe that the use of a generational mortality table may require future analysis regarding its potential use, but the use of the RP-2000 Disabled Retiree table projected with Scale AA to 2025 and a two year setback for male participants is acceptable, and is consistent with ASOP 35. However the application of mortality after disability is not consistent. The mortality used in developing the liability of a participant decrementing from active service due to disability differs based on the benefit being valued. The disability income replacement benefit is valued using disability mortality, but the disability retirement benefit is valued using healthy mortality. This usage of healthy and disabled mortality is also being applied to those participants currently disabled. We believe that a future analysis into the financial impact of this should take place if data is determined to be available, but do not feel that the likely magnitude of a change requires a change to the assumption due to its immateriality and the practical limitation of data.

Mortality Specific to Lump Sum Cash Outs

We concur that the mortality rates for participants electing lump sum cash outs used by Segal in valuing the Plan are reasonable, consistent, and accurate. As with the general mortality assumption, we believe that the use of a generational mortality table in the future may be contemplated, but the use of the RP-2000 Combined Healthy table projected with Scale AA to 2025 and a two year setback, weighted 40% male and 60% female, is acceptable.

Withdrawal From Service Before Retirement

We concur that the withdrawal tables used by Segal are reasonable, consistent, and accurate. Segal uses a table based on service for Faculty and a separate table based on service for Staff and Safety members. We find that this is a sound methodology.

Retirement

We concur that the retirement tables used by Segal are reasonable, consistent, and accurate. Segal uses different age and service based retirement tables depending upon whether the members are designated as Faculty, Staff, or Safety employees. We find that this is a sound methodology because Faculty personnel tend to retire at a lower frequency than either Staff or Safety (highest frequency) personnel.

Withdrawal of Contributions at Termination

We concur that the assumptions for withdrawal of contributions at termination used by Segal are reasonable, consistent, and accurate.

Other Demographic Assumptions

Segal employs numerous other demographic assumptions such as a percentage of married participants and spouse age differences. It is our understanding that beneficiaries, including eligible survivors, contingent annuitants, and spouses, are valued within the Plan, and therefore the liabilities reported include benefits paid to beneficiaries. We confirmed that the spousal age difference assumption is very close to the actual current difference (3.06 years older for men as opposed to an assumption of 3.0 for example) generated by the data, and have no reason believe this will change significantly in the future. Overall, we concur that the other demographic assumptions used by Segal are reasonable, consistent, and accurate.

Economic Assumptions

Inflation

The Plan uses a 3.50% assumed rate of inflation. As we noted in the UCRP Experience Study, we believe this rate is near the top end of the reasonableness range, although it is consistent with what other large systems are using. We concur that the inflation rate used by Segal is reasonable, and is consistently and accurately applied.

Investment Rate of Return

The Plan uses a 7.50% investment return rate, net of expenses. As noted in the UCRP Experience Study, we believe this rate is conservative, but still lies within a reasonable range given the investment mix and is therefore acceptable.

Cost-of-Living Adjustment

We concur that the COLA assumptions used by Segal in valuing the Plan are reasonable, consistent and accurate. While two ad hoc COLAs have been provided by the Plan in the past decade, we believe the future assumption of no ad hoc COLAs is correct and represents the current actuarial practice of not recognizing potential future amendments until the plan is actually amended. Although the inflation rate utilized by the Plan is at the top end of the range for reasonableness, a lowering of that rate to the middle of the range would not affect the 2% per annum COLA generated by the assumption, so we are comfortable with this. This interaction is discussed in more detail in the experience study of the University of California Retirement Plan ("UCRP").

Salary Increases

The Plan increases annual compensation by inflation, a 0.50% per year “across the board” salary increase, as well as merit and promotional increases that differ by service separately for Faculty and the combination of Staff and Safety. As noted in more detail in our experience study, we concur that the salary increase assumptions used by Segal are reasonable, consistent, and accurate.

Section 3 – Audit of Compilation of Actuarial Valuation

The cornerstone of any actuarial audit is a replication of the actuarial valuation. As mentioned above, we matched quite closely both the Plan data and the Plan liabilities developed by Segal for the University of California Retirement Plan. After a number of phone conferences and the sharing of details between Aon Hewitt and Segal regarding the actuarial valuation, including an analysis of test cases that brought to light minor changes that Segal has implemented, the total actuarial liability calculated by Aon Hewitt was within 0.4% of the liability calculated by Segal. Actuaries generally use a 2.0% deviation as an acceptable range of error for the liability, although in some cases a smaller deviation of as low as 0.50% is used. Because our deviation is well within the standard and an exceptional "margin of error", we are satisfied that the numbers generated by Segal are correct.

Aon Hewitt then worked with Segal and the University to confirm the asset values under the Plan (both market and actuarial). Conversations and the passing of information between the two firms allowed Aon Hewitt to agree that the calculations provided by Segal are correct.

The confirmation of the actuarial accrued liabilities and the assets allowed us to then match the GASB 25 specific costs and reporting as well. Both the GASB costs and the reporting of GASB 25 required information was consistent with our calculations and understanding of the disclosure requirements. Consequently, we conclude that the valuation results are reasonable, accurate and consistent with the data provided, the assumptions utilized, and the standards that cover the Plan.

If there is a desire to review further, we can provide Segal with more of our data for comparison or request that they provide additional information. We do not believe it is in the best interest of the University to hire actuaries to analyze potential discrepancies of 0.4%, however. Such a difference in value is dwarfed by the use of more significant assumptions, methods and processes which the systems and actuaries make routinely.

Section 4 – Summary of Valuation Changes

During the process of checking the valuation results, several recommendations were made for improving the valuation results to more accurately reflect the Plan's liabilities. Some changes to the report have already been suggested and were implemented. Some of the changes that we suggested that have been implemented include typographical changes, as well as wording suggestions to improve a reader's clarity. There are no further changes which we believe Segal must make this year.

Additionally, there are a few minor tweaks that Segal may want to consider for the July 1, 2012 valuation. Our estimate is that the combined liability impact of these changes would be minimal. These minor changes include:

- The survivor coverage for the UCRP disability income currently does not stop when the participant's disability income stops (e.g., at age 65 or age 67).
- The valuation assumes that all disabilities and deaths are non-duty related. The duty related disability and death benefits are more generous than the non-duty, and a split of those deaths and disabilities could perhaps be considered.
- The 401(a)(17) compensation limits for years prior to the valuation year are assumed to be equal to the current year's 401(a)(17) compensation limit. This would impact the liability of those members decrementing from active service in the current year who are earning above the compensation limit as well as the calculation of the entry age normal liability for those members who have earned above the compensation limit in the past.
- As previously mentioned, a consistent application of disability mortality for those members currently disabled or expected to become disabled in the future.

Section 5 – Other Considerations

The valuation report produced by Segal is professionally written and is thorough. In particular, for a report this thorough, we found it extremely useful that referencing notes for important bullet points are included in the margins of the pages, which make it easy for the reader to quickly locate within the report sections where more information on certain topics is available. However, we do have some suggestions, both aesthetic as well as technical, which we believe would make Segal's valuation report even more complete and useful to its readers, but none of these rise to the level of required changes.

- The primary purpose of the valuation report is clearly defined and has been met in the report. However, one of the main purposes of this report is to show that the valuation and accompanying analyses and charts meet the GASB 25 disclosure requirements, which this report indeed does. We believe that the purpose of the report could be expanded to also note that it meets the GASB 25 disclosure requirements.

- In order to comply with sound actuarial practices, the report should contain enough information for another actuary to reasonably reproduce all calculations that are shown in the report. We believe there are instances, specifically in the GASB disclosure sections, where the report does not provide enough information for another actuary to reproduce all of the calculations. Particularly, it is unclear by solely using the information contained in the report that covered payroll is generated properly. Additionally, while many calculations are generated without the laboratory segments reflected, this could be better communicated, perhaps by segregating calculations with and without the laboratory segments. To the extent possible and deemed necessary by the University, we believe that more information regarding the calculation of laboratory liabilities and costs should be provided within the report.

- There are numerous instances in the report where the Plan is referred to as "unfunded." Given that the plan does have assets associated with it, we believe a more appropriate term for some of these uses may be "underfunded." This can be seen, for example, on page iii under "Funded Ratio" when Segal states that "The Plan is in an unfunded position…" In other places however, the use of "unfunded" is proper, and should be retained. Consideration of a review of the use of the term "unfunded" and the benefits that certain changes would generate should take place. Please note, subsequent to our comment, Segal updated its draft report to reflect this comment.

- On page v in the second bullet under "Demographic Experience," it should be noted that the average assumed salary increase of 5.50% is based on assumptions from 2010, which may not be applicable for 2011. Please note, subsequent to our comment, Segal updated its draft report to reflect this comment.

- On page vi in the Summary of Key Valuation Results, Segal may want to consider adding a note describing the GASB 25 annual required contributions as not final. Additionally, because this is a complex calculation, we believe consideration for placing backup for this calculation in the report, or noting that additional backup is available to the reader, should take place. However, since this is not a value used in the report for the current year, we are also not opposed to removing this value from the report entirely until it becomes final. Please note, subsequent to our comment, Segal updated its draft report to reflect this comment.

- On page 4 in the first paragraph under “Financial Information,” we believe the phrasing “net contributions (less administrative expenses” and “net investment earnings (less investment fees)” is redundant and could generate confusion for the readers. We believe a better phrasing would read “contributions, net of administrative expenses” or “net contributions (contributions less administrative expenses” and “investment earnings, less investment fees” or “net investment earnings (investment earnings less investment fees)”. Please note, subsequent to our comment, Segal updated its draft report to reflect this comment.

- Page 6 shows a chart that summarizes the net experience loss that has occurred during the past year. While it states that a “discussion of the major components of the actuarial experience is on the following pages,” only the net loss from investments generates detailed analysis, and only the salary gain gets its own line. While investments generate the most significant source of losses during the year, we believe a more complete discussion of the gains and losses during the year would also quantify the net loss from other experiences, which includes the gains and losses due to termination, retirement experience, mortality, etc. listed on page 9.

- On page 10, we believe it may be beneficial to highlight the fact that the values reported in Chart 11 are based on non-laboratory segments of the UCRP. This notation is particularly important in the case for the normal cost and percentage of payroll columns in the chart, which are really based on non-laboratory, post-decrement payroll. While we recognize that this fact is already found in the title (in parenthesis), we believe this can be facilitated by adding to the third footnote that the total plan contribution rate is based on these non-laboratory segments of the UCRP. Please note, subsequent to our comment, Segal updated its draft report to reflect this comment.

- On page 19, it should be noted again that the net investment income is based on the actuarial value of assets, not the market value. While found elsewhere in the report, this fact may not be remembered by the reader. Please note, subsequent to our comment, Segal updated its draft report to reflect this comment.