
Texas Emergency Services Retirement System

Final Actuarial Audit Report of the August 31, 2014 Valuation

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February 22, 2016

Ms. Michelle Jordan
Executive Director
Texas Emergency Services Retirement System
P.O. Box 12577
Austin, TX 78711

Re: Final Actuarial Audit Report of the August 31, 2014 Valuation

Dear Ms. Jordan:

The enclosed report presents the findings and comments resulting from a peer review audit of the August 31, 2014 actuarial valuation performed by Rudd & Wisdom, Inc. (R&W) for the Texas Emergency Service Retirement System (TESRS). 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.

Due to plan asset size, TESRS is not subject to the audit requirements of Texas Government Code §802.1012; however, this audit is being voluntarily conducted on the basis of the applicable statute. Therefore, we submitted a preliminary draft of the actuarial audit report to TESRS on January 20, 2016. We received responses to our draft audit report from TESRS on February 3, 2016. Section 8 of this report (Summary of Recommendations and Observations) has been expanded to include the responses prepared by the TESRS, based on consultation with R&W.

in accordance with Texas Government Code §802.1012, we are submitting this final audit report which includes the responses received from TESRS not earlier than the 31st day and not later than the 60th day after the date of the preliminary draft audit report. This final report should be submitted to your governing body and the State Pension Review Board (at your discretion) within 30 days after the date of your receipt of this final audit report.

Future actuarial measurements may differ significantly from the current measurements presented in actuarial valuation reports due to many factors, including: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements, nor did we perform a full replication of the valuation results.

This work product was prepared solely for Texas Emergency Services Retirement System for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by TESRS's staff, R&W's staff, and public information. 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 used for other purposes. During the course of our audit, we reviewed the data supplied by TESRS to R&W and the methods and assumptions used by R&W to develop the actuarial liabilities; however, we did not audit the data supplied to R&W for the actuarial valuation. Since the audit results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations 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 Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations of the American Academy of Actuaries.

Milliman's work product was prepared exclusively for TESRS for a specific and limited purpose. It is a complex technical analysis that assumes a high level of knowledge concerning R&W's operations and uses of TESRS's data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

We would like to express our appreciation to the R&W staff and the TESRS staff for their assistance in supplying the data and information on which this report is based.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

We, James Tumlinson, Jr. and Bryan Wilson, are members of the American Academy 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 look forward to discussing it with you.

Sincerely,



James Tumlinson, Jr., EA, MAAA
Principal and Consulting Actuary



Bryan Wilson, EA, MAAA
Consulting Actuary

**Texas Emergency Services Retirement System
Actuarial Audit of the August 31, 2014 Valuation**

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Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 1 Executive Summary



Purpose and Scope of the Actuarial Audit

The purpose of an actuarial audit is to review the work performed by the System's actuary to assure the actuarial condition of the System is accurately measured, and that the contribution rate, together with the current assets, is sufficient to provide the benefits promised to its members. TESRS has requested that we give an opinion regarding the accuracy and reasonableness of the following:

- The member data used in the valuation process
- The assumptions in use
- Proper application of the funding method
- The results of the valuation including analysis of the accrued liabilities through testing of sample lives
- Conformity with Chapters 861, 864, and 865 of the Texas Government Code
- Compliance with the Texas Pension Review Board Guidelines for Actuarial Soundness and relevant Actuarial Standards of Practice

There are two basic approaches that can be used in an actuarial audit:

1. a "replication" audit, in which the actuarial valuation is completely replicated by the review actuary; and
2. a "peer review" audit, in which the review is based on a sample of calculations and there is an overall review of the appropriateness of the assumptions and methods rather than a replication of the entire valuation.

TESRS has requested a peer review audit. It should be noted that certain situations may not surface based on peer review samples, so there cannot be 100% certainty of the accuracy of the retained actuary's work. However, a peer review audit can give a fairly reasonable sense of confidence that the overall processes and procedures are appropriate, and provide a high degree of confidence that any unknown situation would only have a minor financial impact. Additionally, a peer review audit can turn up some issues that would not surface in a replication audit, since a peer review audit focuses more on the overall picture; whereas, a replication audit is more detail oriented.

Performing an actuarial audit is similar to doing detective work. The auditing actuary is presented with a set of facts, the "clues," and then tries to reconstruct the past events based on the available data. The auditing actuary's information is never as complete or detailed as that available to the retained actuary.

Purpose and Scope of the Actuarial Audit (cont.)

Nevertheless, the purpose of the audit is to have the auditing actuary acquire a certain level of confidence that the findings and the results of the retained actuary's work are reasonable and were performed according to generally accepted actuarial standards and principles.

Statement of Key Findings

Based upon a thorough review of the August 31, 2014 actuarial valuation and the actuarial experience study for the five-year period ending August 31, 2007 as supplemented by the recommended assumptions for the August 31, 2014 valuation, we found the actuarial work to be reasonable. The valuation was performed by qualified consultants in accordance with generally accepted actuarial standards and principles.

The main area where we found some differences was in the setting of economic assumptions, particularly the inflation assumption as it relates to the investment return assumption.

As this was not a replication audit, our analysis focused on calculations for sample individual members rather than on the total liabilities of the System. Overall, we found the actuarial liabilities calculated by Rudd & Wisdom, Inc. (R&W) to be within a reasonable range of our independent calculations. However we are recommending consideration of some adjustments for future valuations. These recommendations, as well as some other general observations, are detailed in Section 8.

As discussed later in this section, we would expect the impact of a recommended adjustment to the investment return assumption to be significant. Our conclusions concerning the primary issues of this review are as follows:

- **Assumptions:** The actuarial assumptions developed in experience study for the five-year period ending August 31, 2007 as supplemented by the recommended assumptions for the August 31, 2014 valuation and used in the August 31, 2014 actuarial valuation are generally reasonable. While we found the inflation assumption, as it relates to the currently used investment return assumption, to be somewhat aggressive (i.e., high), we believe the assumptions are appropriate and meet the principles prescribed by the Actuarial Standards Board (ASB) in their Standard of Practice No. 27 for economic assumptions and No. 35 for demographic assumptions.
- **Review of Individual Test Lives:** As part of the audit process, we individually calculated the liabilities for 22 different members. We found these calculations accurate and consistent with the plan provisions, actuarial assumptions, and funding method.

Statement of Key Findings (cont.)

- **Membership Data:** We performed tests on the raw data and the valuation data, both on individuals and in aggregate. Overall, the data used in the valuation appears reasonable.
- **Actuarial Liabilities:** One purpose of this actuarial review was to verify the benefits and liabilities. Although we did not reproduce the total liabilities of the System, we performed an in-depth analysis of the liabilities of sample members as well as performing a rough estimate of total inactive liability. We found that the benefit provisions of TESRS were generally accounted for in an accurate manner.
- **Actuarial Value of Assets:** The smoothing method used in the calculation of the actuarial value of assets is reasonable and correctly applied. This method is consistent with current standards of actuarial practice.
- **Application of Funding Method:** We reviewed the application of the funding method and find it is reasonable and that it meets generally accepted actuarial standards. We also agree with the choice of the Entry Age Level Dollar method for allocating costs.
- **Recommendations and Observations:** We have recommended further review and consideration of potentially changing a few assumptions for the next actuarial valuation. Additionally, we have made several observations that TESRS should consider for the next valuation including an experience review of assumptions.

Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 2 Qualifications

Audit Conclusion



The TESRS August 31, 2014 actuarial valuation, as well as the actuarial experience study for the five-year period ending August 31, 2007 were performed by qualified actuaries and in accordance with the principles and practices prescribed by the Actuarial Standards Board (ASB).

Comments

The August 31, 2014 actuarial valuation report was signed by Mr. Mark R. Fenlaw and Ms. Rebecca B. Morris of Rudd & Wisdom, Inc. Mr. Fenlaw also signed the actuarial experience study performed for 2002-2007. We believe Mr. Fenlaw and Ms. Morris are actuaries qualified to perform the TESRS valuations.

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. Fenlaw is a Fellow in the Society of Actuaries (FSA) and Ms. Morris is an Associate in the Society of Actuaries (ASA) and both are currently compliant with continuing education requirements. This satisfies this requirement.
- **Experience:** Mr. Fenlaw and Ms. Morris are experienced at performing pension valuations. In particular, they have experience working with public-sector retirement systems. This satisfies this requirement.
- **Continuing Education:** We verified through the Academy website that both Mr. Fenlaw and Ms. Morris are members of the American Academy of Actuaries. As such, they must meet minimum continuing education requirements to maintain this designation. This continuing education satisfies this requirement.

Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 3 Actuarial Assumptions

Audit Conclusion



The actuarial assumptions developed in the actuarial experience study for the five-year period ending August 31, 2007, the recommended assumptions for the August 31, 2014 valuation, and the assumptions used in the August 31, 2014 actuarial valuation are generally reasonable. We believe the assumptions are appropriate and meet the principles prescribed by the Actuarial Standards Board (ASB) in their Standard of Practice No. 27 for economic assumptions and No. 35 for demographic assumptions.

Comments

The purpose of the actuarial valuation is to analyze the resources needed to meet the current and future obligations of the system. To provide the best estimate of the long-term funded status of the System, the actuarial valuation must be predicated on methods and assumptions that will estimate the future obligations of the System in a reasonably accurate manner.

An actuarial valuation utilizes various methods and two different types of assumptions: economic and demographic. Economic assumptions are related to the general economy and its long-term impact on the system, or to the operation of the system itself. Demographic assumptions are based on the emergence of the specific experience of the System's members.

We reviewed the most recent experience study for the five year period ending August 31, 2007 and the recommended assumptions for the August 31, 2014 valuation. We have only minor suggestions with the development of the demographic assumptions such as mortality. However, our suggestion regarding the selection of an appropriate inflation rate and resulting investment return assumption is more significant. These suggestions are explained further in this section.

In reviewing the assumptions currently used by R&W, we are guided by the Actuarial Standards Board (ASB) Actuarial Standard of Practice No. 4. The actuary is required by the standard to consider the reasonableness of each actuarial assumption independently on the basis of its own merits, of its consistency with each other assumption, and of the degree of uncertainty and potential for future fluctuations. Although a set of assumptions in the aggregate may appear to reflect the System's experience, failing to isolate the individual assumptions can lead to inappropriate results when a particular aspect of the plan or a change in the plan is under review.

Milliman's Approach to Experience Studies

Similar to an actuarial valuation, the calculation of actual and expected experience is a fairly mechanical process. From one actuary to another, you would expect to see very little difference. However, the setting of assumptions is a different story, as it is more art than science. Our general philosophy in making assumption changes includes the following:

- **Don't Overreact:** When we see significant changes in experience, we generally do not adjust the rates to reflect the entire difference. We will generally recommend rates somewhere between the old rates and the new experience. If the experience during the next study shows the same result, we will probably recognize this trend at that point. On the other hand, if the experience returns closer to its prior level, we will not have overreacted, possibly causing unnecessary volatility in contribution rates.
- **Anticipate Trends:** If there is an identified trend that is expected to continue, we believe that this should be recognized. An example of this is the retiree mortality assumption. It is an established trend that people are continuing to live longer; therefore, we will usually like to have a higher margin to reflect future expected decreases in mortality rates.
- **Simplify:** Where there is no material difference in results, we attempt to simplify our assumptions and methods. There is no point in complexity that does not improve accuracy.

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 (ASB). In particular, we confirmed that the work done conforms to the ASB's Code of Professional Conduct and the relevant ASOPs:

- **ASOP #4: *Measuring Pension Obligations*** – We believe that R&W's work is consistent with this standard.
- **ASOP #27: *Selection of Economic Assumptions for Measuring Pension Obligations*** – We believe R&W's work and recommendations are consistent with this standard.
- **ASOP #35: *Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations*** – We believe that R&W's work is consistent with this standard.
- **ASOP #44: *Selection and Use of Asset Valuation Methods for Pension Valuations*** – We believe that R&W's work is consistent with this standard.

Economic Assumptions

Based on the information and economic environment present in 2014, we believe the economic assumptions recommended by R&W were generally reasonable, but we do recommend reviewing the inflation assumption and its possible impact on the investment return assumption.

The Actuarial Standards Board has adopted Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. A newly revised version of ASOP No. 27 was effective September 30, 2014. This standard provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans.

The 2008 experience study and the recommended assumptions for the August 31, 2014 valuation present evidence that the recommendations were developed in accordance with the applicable Actuarial Standards of Practice applicable at the time.

The newly revised version of ASOP No. 27 was effective September 30, 2014. The new revisions to ASOP No. 27 state that economic assumptions can be based on either the actuary's estimate of future experience or observations of the estimates inherent in market data. The standard also indicates the actuary should identify a range of reasonable values for each economic assumption, and then to recommend a specific assumption. The revised standard also explicitly advises the actuary not to give undue weight to recent experience.

We conducted our review of the assumptions used by TESRS taking into consideration the version of ASOP No. 27 in effect at the time the assumptions were set, but we are also keeping the revised ASOP in mind when making our recommendations for each economic assumption.

The Board should be aware that the Actuarial Liability is directly impacted by these important assumptions. The present value of benefits is impacted by the total investment return assumption.

The current package of economic assumptions falls within a reasonable range although we believe the inflation assumption is fairly aggressive (i.e., high). Since economic assumptions are subjective in nature, it is our recommendation that the Board be fully comfortable with the implications of the assumptions. There is an "actuarial risk" associated with the economic assumptions the same as there is an investment risk associated with a given portfolio mix. The assumptions do not affect the actual long-term cost of a plan. The ultimate cost will emerge in accordance with the benefits and expenses that are actually paid.

Economic Assumptions (cont.)

Inflation: The inflation assumption used in the August 31, 2014 valuation to build the assumption for investment return was 3.5%. We have compared the 3.5% assumption against several professional forecasts of near term and long term inflation. For example, the 4th Quarter 2014 Survey of Professional Forecasters released November 17, 2014 by the Philadelphia Federal Reserve Bank projected 2.20% inflation (median) for the period 2014-2023, and the CBO's July 2014 report *The 2014 Long-Term Budget Outlook* projected 2.50% annualized growth in CPI from 2014-2089. Finally, the 2014 Social Security Trustees Report assumes 2.7% ultimate CPI in their intermediate forecast with 2.0% and 3.7% for the low and high forecasts respectively.

Considering various economic forecasts for inflation, we feel that 3.5% is at the extreme high-end of a reasonable range for the inflation assumption and would be more comfortable with an inflation assumption between 2.0% and 3.0% over a 30-50 year time horizon, such as the period covered by the actuarial valuation. We recommend R&W and TESRS review the inflation assumption in light of current forecasts for the August 31, 2016 valuation.

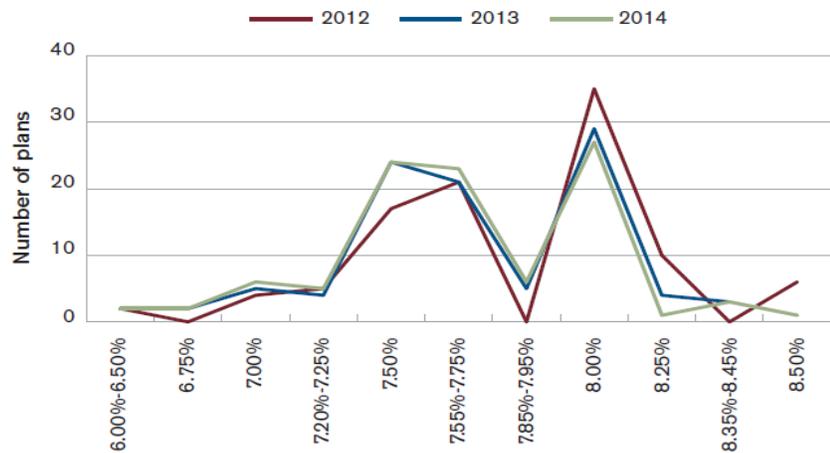
Investment Return: The investment return assumption is one of the primary determinants to allocate the expected cost of the benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. The current assumption for investment return is 7.75% per year and has been set using a building-block approach with 3.5% inflation plus 4.25% real return on assets. Based on the August 31, 2014 asset allocation, we feel that the 4.25% real return on assets was reasonable. However, we believe the 7.75% total investment return to be at the high end of a reasonable range of investment return assumptions due to the 3.5% inflation assumption as previously discussed.

Economic Assumptions (cont.)

We also compared the TESRS investment return assumption to other systems, although comparing one system's assumptions to those of other systems has only limited importance in setting an assumption.

- The assumption of 7.75% was right at the median when compared with the assumption made by public systems considered in the Milliman 2014 Public Pension Funding Study. Interest rate assumptions from the 2014 study are shown in Figure 5 from the study below.

FIGURE 5: SPONSOR-REPORTED INVESTMENT RETURN ASSUMPTIONS



Demographic Assumptions

Demographic assumptions relate to the probability of an active member leaving the system. We reviewed both the current demographic assumptions and the recent changes recommended in the experience study. We found them to be reasonable and generally consistent with our preferred methods. Accordingly, we only have minor comments.

Studies of demographic experience involve a detailed comparison of actual and expected experience. If the actual experience differs significantly from the overall expected results, or if the actual pattern does not follow the expected pattern, new assumptions are considered. Recommended revisions normally are not an exact representation of the experience during the observation period. Judgment is required to predict future experience from past trends and current evidence, including a determination of the amount of weight to assign to the most recent experience.

Member Mortality: This is obviously a critical assumption for appropriately calculating the liability for all retirees and beneficiaries. Given recent improvements in longevity, a margin is usually set to allow for additional improvements. This assumption is used to value not only benefits payable to the current retired members but also in projecting the value of future benefit payments to active members many years ahead. Thus, the extra margin is needed in the liabilities to recognize mortality improvements that are expected to occur in the future.

The life expectancies of current and future retirees are predicated on the assumed rates of mortality at each age. It is commonly known that rates of mortality have been declining throughout the last century, which means people, in general, are living longer. The mortality experience of this System has generally improved over the years, too, and revisions have been recommended periodically to anticipate these improvements.

The current mortality assumption is the RP-2000 Combined Healthy mortality table with mortality improvements projected using Scale AA through 2018. R&W has already advised TESRS that the mortality table may be updated for the August 31, 2016 valuation. We feel that the mortality assumption used in the 2014 valuation is reasonable but we agree with R&W that it should be reviewed and probably updated beginning with the 2016 valuation. The new RP-2014 mortality table is a possibility although the SOA did not recommend use of RP-2014 for public plans and they have recently released an update to their improvement scale. At the least, we would recommend that the projection for future mortality improvements be extended from 2018 to a year further in the future (e.g. 2024). Consideration should also be given to using a generational mortality projection

Demographic Assumptions (cont.)

scale, such as Scale BB which was released by the Society of Actuaries in 2012, to recognize future improvements in mortality.

Termination: The turnover rates vary by both entry age and service, and the rates were reasonable in review of the 2008 experience study. However, the turnover rates were built based on experience for the five year period ending August 31, 2007. We typically recommend that demographic assumptions be compared to actual experience every five to seven years and, therefore, we suggest having an experience study performed with one of the next two valuations to evaluate the turnover assumption relative to more recent experience.

Disability: There was very little disability experience for consideration in the 2008 assumption study and this may still be true considering more recent experience. However, review of actual disability experience since 2008 would be part of a new experience study which we recommend above in Turnover.

Retirement: Rates of retirement were determined with the 2008 experience study and, overall, were a good match for the actual experience from August 31, 2002 through August 31, 2007. However, we again recommend a study be performed for one of the next two valuation cycles to compare the assumption with more recent experience.

Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 4 Membership Data

Audit Conclusion



We performed tests on the raw data and the valuation data, both on individuals and in aggregate. Overall, the data used in the valuation appears reasonable.

Comments

- **Accuracy:** We reviewed several members for accuracy and found the data to be representative of the members as well as reasonable for the valuation purposes.
- **Completeness:** The raw data provided for the valuation by TESRS contains sufficient information to complete the actuarial valuation. There were some missing items (e.g., spouse dates of birth and marital status) but R&W made assumptions for missing data that should not materially impact the valuation results.
- **Valuation Data:** The data used in the valuation is reasonably consistent with the raw data provided by the TESRS staff.

Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 5 Actuarial Value of Assets

Audit Conclusion



The smoothing method used in the calculation of the actuarial value of assets is reasonable and correctly applied. This method is consistent with current and proposed standards of actuarial practice.

Comments

The method used to determine the actuarial value of assets is a five-year smoothing of asset gains and losses. This means that the market value as of the valuation date is adjusted by 20% of the most recent year's gain or loss, and 20% of each of the prior four years' gains or losses. The actuarial value of assets is subject to a corridor whereby it cannot be less than 80% nor more than 120% of the market value of assets. We agree that a smoothing method is appropriate and believe that five years with a 20% corridor around the market value is reasonable. We noticed that the asset valuation method changed in 2010 from a 10% corridor around the market value to a 20% corridor around the market value and find that this change is reasonable.

As mentioned in the section on assumptions, actuaries are guided by the Actuarial Standards of Practice (ASOP). ASOP 44 provides guidance on asset valuation methods. We find the current method used for TESRS to be consistent with these guidelines.

We have confirmed that the actuarial value of the assets calculated for the August 31, 2014 valuation is accurate and reasonable.

Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 6 Actuarial Liabilities

Audit Conclusion



One purpose of this actuarial review is to verify the benefits and liabilities. Although we did not reproduce the total liabilities of the System, we did perform an in-depth analysis of the liabilities of 22 sample members (10 actives, 9 retirees, and 3 terminated vesteds). We found that the benefit provisions of TESRS were generally accounted for in an accurate manner.

Comments

To perform this analysis, Rudd & Wisdom, Inc. provided us with detailed calculations (“test lives”) 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.). We then independently calculated the liabilities for the 22 sample members. We found the R&W calculations to be very consistent with ours in total as well as across benefit types.

Summary of 10 Active Test Cases

Present Value of Future Benefits

	<u>Milliman</u>	<u>R&W</u>	<u>Ratio</u>
Termination	48,524	48,282	100.5%
Retirement	192,157	192,499	99.8%
Death	3,687	3,706	99.5%
Disability	667	666	100.2%
Total	245,036	245,153	100.0%

Actuarial Accrued Liability

	<u>Milliman</u>	<u>R&W</u>	<u>Ratio</u>
Termination	41,586	41,358	100.6%
Retirement	185,105	185,464	99.8%
Death	2,381	2,395	99.4%
Disability	397	396	100.2%
Total	229,469	229,613	99.9%

Normal Cost

	<u>Milliman</u>	<u>R&W</u>	<u>Ratio</u>
Termination	1,130	1,125	100.5%
Retirement	1,318	1,314	100.3%
Death	214	214	99.6%
Disability	55	55	100.1%
Total	2,717	2,709	100.3%

Summary of 12 Inactive Test Cases

	<u>Milliman</u>	<u>R&W</u>	<u>Ratio</u>
Term Vested	21,285	21,261	100.1%
Retired	116,309	116,309	100.0%
Total	137,594	137,570	100.0%

Comments (cont.)

For inactive members, R&W provided us with the inactive data used for the August 31, 2014 valuation. We used this information to perform a rough estimate of the total inactive liability, and an aggregate comparison of our calculations to R&W's calculations is shown below.

Summary of Inactive Liability			
	<u>Milliman</u>	<u>R&W</u>	<u>Ratio</u>
Term Vested	16,190,846	16,174,530	100.1%
Retired-Advance Funded	<u>39,003,253</u>	<u>38,943,080</u>	100.2%
Total	55,194,099	55,117,610	100.1%

As a result, we found the inactive liability to be reasonable and consistent with the inactive census data and believe that the Board can have a high degree of confidence that the inactive members' benefits are being valued appropriately.

Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 7 Application of Funding Method

Audit Conclusion



We reviewed the application of the funding method and find it is reasonable and that it meets generally accepted actuarial standards. We also agree with the choice of the Entry Age Normal method on a level dollar basis for allocating costs.

Comments

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 that allocate the cost over the members' working years. In this way, benefits are financed during the time in which services are provided.

The cost method used by TESRS is the Entry Age Normal method which creates theoretically level contribution rates on a level dollar basis. It is a popular method for public-sector retirement systems with benefits that are not related to pay. We believe this is because it does a good job of producing stable contributions over a member's working lifetime.

The actuarially calculated contribution rate is determined as follows:

1. The normal cost is calculated as the level contribution, on a level dollar basis, necessary to fund a member's benefit from entry until termination (entry age method).
2. The unfunded actuarial accrued liability (UAAL) is calculated as:
 - (a) the present value of all benefits
 - (b) less the actuarial assets
 - (c) less the present value of all future normal cost contributions.
3. The UAAL contribution is calculated as the level contribution required to finance the UAAL over a period of 30 years. Although not uncommon, 30 years is generally the maximum period most systems use to finance the UAAL. It is also the maximum amortization period permitted by Texas State Government Code Section 861.001(1).

Comments (cont.)

We believe the contribution rates are calculated accurately. However, the contribution rates from the current participating entities are not sufficient to pay the normal cost and amortize the unfunded actuarial accrued liability over a 30 year amortization period. In order to meet the 30 year amortization requirement of State Code Section 861.001(a), the System is dependent on appropriations from the State of Texas totaling almost \$2.0 million per year: \$625,000 for administrative expenses plus \$1.3 million for payment toward the unfunded actuarial accrued liability. Section 865.015 of the State Code specifies that the State's Contribution "may not exceed one-third of the total of all contributions by governing bodies in a particular year."

R&W has projected 30 years of contributions from both participating departments and State appropriations using certain assumptions regarding projections of the number of participating departments, prior service contributions, and reimbursement contributions. TESRS has reviewed the assumptions and approved the projections as reasonable and conservative.

If actual experience regarding the projection of future contributions is less than expected, then the System would likely not be able to amortize the unfunded actuarial accrued liability over a 30 year period without implementing the Part Two contributions, which would be additional contributions from the member departments that would not impact retirement benefits but would be solely for the purpose of ensuring that the unfunded actuarial accrued liability is amortized over a 30 year period.

Texas Emergency Services Retirement System Actuarial Audit of the August 31, 2014 Valuation

Section 8 Recommendations and Observations

Audit Conclusion



Our recommendations and observations for consideration with the next valuation or experience study, and the responses from the Board of Trustees of the Texas Emergency Services Retirement System (“TESRS” or “the Board”), based on consultation with Rudd & Wisdom (***shown in dark blue bold italics***), are presented below.

Comments

Recommendations

We recommend further review and consideration of changing the following assumptions in the next valuation. As discussed earlier, any adjustment to the investment rate of return assumption would have a significant on the overall valuation results.

- **Rate of Inflation:** The current investment rate is 3.50%; however, we recommend that TESRS consider lowering the inflation assumption with the next valuation after reviewing current market conditions and available forecasts. Most forecasts of both short-term and longer-term inflation are below 3.50%, and we recommend putting more emphasis on forecasts, including yields on nominal and inflation-indexed debt with less emphasis on historical values when selecting this assumption. For example, the CBO’s July 2014 report *The 2014 Long-Term Budget Outlook* projected 2.50% annualized growth in CPI from 2014-2089 and the 2014 Social Security Trustees Report assumes 2.7% ultimate CPI in their intermediate forecast.

Rudd and Wisdom will consider recommending a lower inflation assumption as a part of their review of the actuarial assumptions to be recommended to the Board for the next actuarial valuation as of August 31, 2016. The Board will consult with Rudd and Wisdom on this assumption at that time.

- **Investment Rate of Return:** The inflation assumption is a component of the investment rate of return. The other component is the real rate of return. Based on the August 31, 2014 asset allocation, we feel the 4.25% real rate of return is reasonable. However, a decrease in the inflation component of investment return would necessarily result in a decrease in the overall investment rate of return.

Rudd and Wisdom will consider the effect of recommending a lower inflation assumption on the recommended investment return assumption as a part of their review of the actuarial assumptions to be

Comments (cont.)

recommended to the Board for the next actuarial valuation. However, it may not necessarily result in a decrease in the recommended investment return assumption since the assumed real rate of return component of the investment return assumption will also be reviewed. The Board will consult with Rudd and Wisdom on this assumption at that time.

- **Mortality Table:** The current mortality table projects mortality improvements through 2018. At a minimum, we recommend extending the projection period several more years for the 2016 valuation. Consideration should also be given to using a generational mortality projection scale, such as Scale BB which was released by the Society of Actuaries in 2012, to recognize future improvements in mortality.

We appreciate the mortality assumption recommendation, as it is a subject that Rudd and Wisdom brought to the attention of the Board for consideration in 2016 during discussion of the recommended assumptions for the August 31, 2014 actuarial valuation. Rudd and Wisdom will consider recommending lower rates of mortality as a part of their review of the actuarial assumptions to be recommended to the Board for the next valuation. The Board will consult with Rudd and Wisdom on this assumption at that time.

Observations

To assist with future assumption setting the following items should be taken into consideration.

- **Experience Study:** The current assumptions for turnover, retirement, and disability are from the 2008 experience study using five-year experience through August 31, 2007. We recommend a new experience study be performed to either validate the continued appropriateness of these assumptions or adjust these assumptions if appropriate.

We agree with your observation. The Board has discussed a timeline for the next experience study, given recent changes to the TESRS statute in Section 865.018 of the Government Code regarding experience studies. Both the Board and Rudd and Wisdom agree that there is a need for an experience study, which is to begin after the completion of the August 31, 2016 actuarial valuation in order to ensure that adequate and credible historical data will be available.

Comments (cont.)

- **Stress Testing:** Stress testing is considered to be among industry best practices and models a retirement system's ability to meet its long-term obligations under a range of possible financial and actuarial outcomes. The State Pension Review Board "recommends that systems conduct, at regular intervals and within appropriate budgetary considerations, stress tests to understand their ability to meet long-term obligations under different outcomes relating to investment return, actuarial demographic experience, and other factors." Given the suggestion above to consider a reduced investment rate of return, stress testing would provide valuable assistance to TESRS in analyzing the impact of actual investment returns differing from the assumed investment rate of return of 7.75%.

The Board and Rudd and Wisdom will consider stress testing as a part of the process of reviewing actuarial assumptions, to determine whether or not the benefits of such testing would outweigh the budgetary impact.