



California Public Employees' Retirement System

Parallel Valuation and Certification Report Judges' Retirement System Valuation

As of June 30, 2016

September 2017

August 1, 2017

David L. Driscoll
Principal, Consulting Actuary

Board of Administration
California Public Employees' Retirement System (CalPERS)
P.O. Box 942701
Sacramento, CA 94229-2701

Conduent HR Consulting, LLC
David.Driscoll@conduent.com
tel 310-226-1480
fax 888-496-9951

Members of the Board:

As provided in Contract 2015-8123, we have reviewed valuations prepared by the CalPERS professional actuarial staff in order to certify that such work satisfies applicable standards of the actuarial profession. In the following pages, we report the results of our review of the June 30, 2016 annual actuarial valuation prepared for the Judges' Retirement System (Judges').

We reviewed the assumptions, methods and procedures used by CalPERS staff to perform the Judges' valuation we examined, and in our opinion they conform to applicable Actuarial Standards of Practice.

In addition, we completed a parallel actuarial valuation for the Judges' Retirement System using the same assumptions and census, asset and benefit provision data that were used by CalPERS staff to prepare their June 30, 2016 valuation of the plan. We compared key results of our parallel valuations to those in the valuation report published by CalPERS.

Each actuarial organization has its own valuation model and applies actuarial assumptions and methods in its preferred way. There is rarely a single "right" answer when it comes to actuarial calculations. For a pension actuarial valuation, we consider one actuary's calculations to reasonably match another actuary's calculations when the present values (liabilities), normal cost contributions, and total employer contributions computed by the two actuaries are within 5% of each other.

For the Judges' Retirement System, our computations of the contribution rates matched those prepared by CalPERS staff within 5%, which was the target tolerance level specified by CalPERS. Our analysis also included a comparison of present value of future benefits, accrued liabilities and normal costs, which also matched within the required 5% threshold. We view the differences between our calculations as immaterial.

Although not required by our contract, we also compared key valuation results for each individual participant (active members, transferred and terminated members, and retired members and beneficiaries) in the Judges' Retirement System. This enhanced reconciliation process provides a deeper review of the calculations and may highlight differences in the handling of individual participants in the valuation process whose effects offset each other when results are aggregated at the level of the entire plan.


The Table of Contents, which immediately follows, outlines the material contained in the report.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions, applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this study.

This report was prepared for the Board and professional staff of CalPERS for their use in evaluating the preparation of actuarial valuations by the System. Use of this report for any other purpose or by other parties may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for other purposes. No one may make any representations or warranties based on any statements or conclusions contained in this report without prior written consent of Conduent HR Consulting, LLC (Conduent).

The undersigned are Fellows of the Society of Actuaries, Members of the American Academy of Actuaries and Enrolled Actuaries. We individually meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Respectfully submitted,



David L. Driscoll, FSA, EA, MAAA
Principal, Consulting Actuary



Aaron Shapiro, FSA, EA, MAAA
Principal, Consulting Actuar

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Section I - Introduction

Under the California Constitution, the Board of Administration has plenary authority and fiduciary responsibility to provide for actuarial services. The CalPERS Chief Actuary advises the Board and directs the activities of the CalPERS professional actuarial staff. The Board also retains the services of an outside actuarial firm to review the work of the CalPERS professional actuarial staff and to certify that such work satisfies actuarial professional standards.

Buck Consultants, LLC was contracted to provide parallel valuation and certification services to the Board. Please note that in 2017, Buck Consultants, LLC has changed its name to Conduent HR Consulting, LLC. The name change does not impact our services to the Board – the same employees will continue to provide the same services and all terms and conditions still apply.

This report summarizes our review of the Judges' Retirement System's actuarial valuation results as of June 30, 2016.

We first reviewed the actuarial assumptions and methods used for the June 30, 2016 Judges' valuation. Our review reflects recent changes in the Actuarial Standards of Practice (ASOP) applicable to the selection of economic assumptions (ASOP 27) and the selection of demographic assumptions (ASOP 35). The results of our review are discussed in Section II.

Next, we completed parallel actuarial valuations for the Judges' Retirement System in order to compare our key valuation results with those published in the valuation report prepared for the plan. CalPERS requested that we reconcile any differences of more than 5% between the two sets of valuation results. Section III contains a summary of our parallel valuation methodology. The results of our analysis are summarized in Section IV.

We have also reviewed the report for the Judges' Retirement System in light of the most recent guidance incorporated in ASOP 4, the standard of practice for measuring pension obligations and determining pension plan costs or contributions. ASOP 4 was significantly updated in late 2013 for valuations made on or after December 31, 2014.

Section II - Review of Actuarial Assumptions and Methods

We have reviewed the actuarial assumptions and methods used in the Judges' valuation. The key valuation assumptions include the following:

- Expected rate of return on investments, net of expenses: 3.25%
- Salary increases: 3.00% per year
- Inflation: 2.75%
- Decrement assumptions including mortality and rates of retirement: based on the latest experience study adopted by the Board

Actuarial Standard of Practice (ASOP) 27 discusses the selection of economic assumptions for the measurement of pension liabilities. Similarly, ASOP 35 discusses the selection of demographic assumptions for the measurement of pension liabilities. In our opinion, the assumptions used in the Judges' valuation are reasonable and the methodology used to select these assumptions is appropriate and consistent with the guidance provided in ASOP 27 and ASOP 35.

We have reviewed the assumed annual rate of return on plan assets of 3.25% using our own economic modeling tool and determined that it is a reasonable assumed long-term expected rate of return for the unfunded closed plan covered by this report. Our determination of the reasonability of the 3.25% assumed rate of return was based on the hypothetical fixed income asset allocation as stated in the Judges' valuation report produced by CalPERS. Alternative assumptions regarding the investment allocation may result in a different assumed investment return.

Section III – Parallel Actuarial Valuation Methodology

The steps followed in our parallel actuarial valuation are described below.

We requested a copy of the final June 30, 2016 valuation report for the Judges' Retirement System, and completed the following steps:

1. We requested:
 - a) The complete decrement tables used by CalPERS to prepare the valuation
 - b) The final participant data used in generating the valuation report
 - c) The key actuarial results presented in each valuation report (normal cost, actuarial accrued liability, present value of benefits, present value future salary, etc.) both in the aggregate and *on a per participant basis*.
2. Using the information provided in the valuation report and in 1(a) and 1(b) above, we produced a valuation for the plan using ProVal[®], a commercially available valuation system used worldwide by actuaries and investment professionals. We generated the key actuarial results for comparison to results published in the actuarial valuation report.
3. In the reconciliation process, using the data provided in 1(c) above and the output from ProVal[®], we compared the key results both on an aggregate basis and an individual basis. Reconciling results for individual participants as well as by plan may uncover multiple discrepancies that offset each other, producing

aggregate results that fall within the 5% tolerance level. Valuation results that differ by less than 5% in total may camouflage systematic errors with respect to particular types of participants. Comparing results by participant helps us to identify the reasons for differences in aggregate result that exceed the 5% tolerance and to identify hidden material discrepancies for results that are within the tolerance as well. As part of this enhanced reconciliation process, we provide in Schedule C a frequency distribution of the percentage difference in key actuarial results by participant.

4. We have communicated preliminary results to CalPERS via email and telephone discussions.
5. In our Summary of Findings in the next section, we provide the following:
 - A recap of issues found in the actuarial review
 - A discussion of how issues were resolved
 - A description of any outstanding issues

Section IV - Summary of Findings

Schedule B summarizes the results for the Judges' Retirement System.

In our parallel valuation and review, we compared present values of future pay, present values of future benefits, actuarial accrued liabilities, and total normal costs. We then used these key valuation results to compute and compare the total employer contribution rate. We are happy to report that our calculation of the employer contribution rates differed by less than 5% from the corresponding results reported by CalPERS.

While the results were within the required tolerance, we did note the following issues related to certain calculations that CalPERS may wish to address:

- Liabilities were not determined correctly for 12 members due to a problem with the underlying data for these individuals. Due to the small number of members for which this occurred (12 out of 2,125), the impact on the plan's total liability was not material.
- As noted in our findings for other CalPERS plans, it appears that for separated employees, no mortality assumption (decrement) is being applied in the period prior to retirement for participants who have separated from employment and are entitled to benefits at a future retirement age. We believe the pre-retirement mortality decrement should be applied in determining liabilities for all participants for all future years.

Neither of the findings above results in our parallel results exceeding the 5% tolerance threshold.

Section V – Additional Comments and Recommendations

Our review has indicated that the actuarial process followed by CalPERS is thorough, complete, and complies with applicable Actuarial Standards of Practice. In the prior section, we identified some technical aspects of the calculation of results that may be considered for further refinement, which are reiterated below. In this section, we also provide some additional comments and recommendations.

Recommendations

1. Add information to the reports to meet new ASOP 4 requirements.

Actuarial Standard of Practice 4 (ASOP 4), which provides guidance for measuring pension obligations and determining pension plan costs or contributions, was significantly revised in 2013 for measurements made as of dates on or after December 31, 2014. In accordance with Section 4.1(s) of the Standard, we recommend the inclusion of more detail on the rationale for changes in assumptions than was present in the report we reviewed.

2. Consider reflecting pre-retirement mortality for all separated participants.

As described in our findings, the valuation results can be refined by reflecting the pre-retirement mortality assumption for all separated participants. This will provide a more precise projection of expected possible outcomes in the future and, as a result, a more precise statement of the current liability of the plans. We recognize that this refinement would not be expected to have a material impact on the valuations' results.

Schedule A – Comparison of Active Member Data

| Plan | | Number of Actives | Average Age | Average Service | Average Pay |
|---------|----------|-------------------|-------------|-----------------|-------------|
| Judges' | CalPERS | 216 | 69.2 | 28.6 | \$196,435 |
| | Conduent | 216 | 69.2 | 28.6 | \$196,435 |

Schedule B – Comparison of Key Valuation Results

| Plan | | Present Value of Benefits | Accrued Liability | Projected Normal Cost (ER+EE) [@] | Employer Contribution Amount# |
|---------|------------|---------------------------|-------------------|--------------------------------------------|-------------------------------|
| Judges' | CalPERS | 3,543,516,613 | 3,428,743,441 | 25,318,403 | 438,155,620 |
| | Conduent | 3,571,406,495 | 3,458,465,490 | 24,679,015 | 441,145,176 |
| | Difference | 0.79% | 0.87% | -2.53% | 0.68% |

[@] Normal cost projected to fiscal year 2017-18.

Based on CalPERS recommended 10-Year amortization.

Schedule C – Comparison of Individual Participant Results

Present Value of Future Benefit Differences (Members Valued: 2,125)

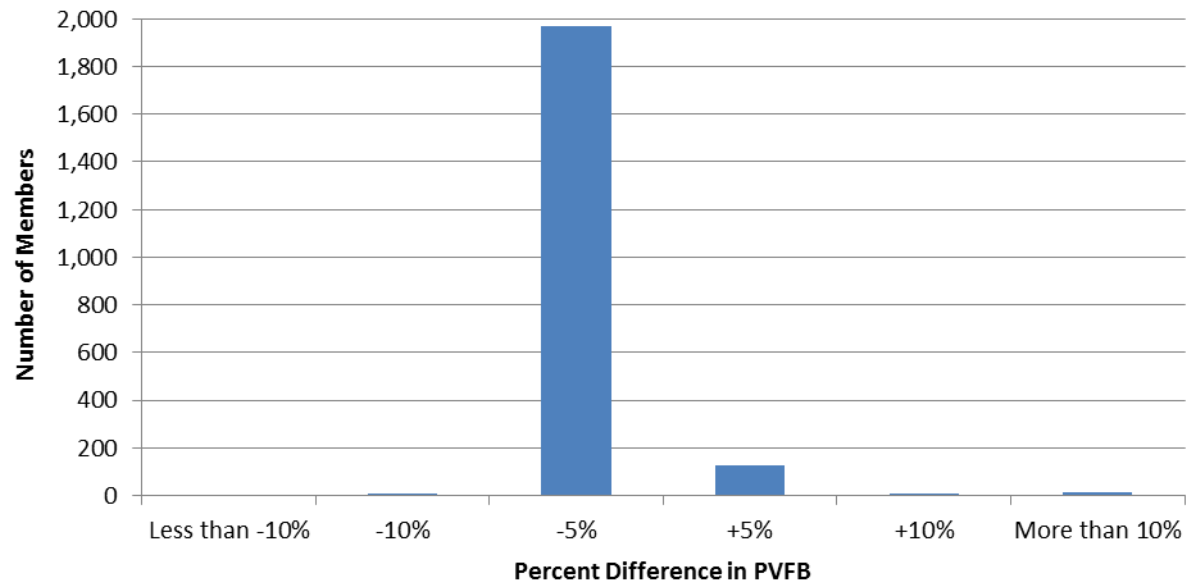


Chart Tabulation Method and Notation: The chart above reflects percent differences between Conduent and CalPERS results, rounded to the nearest hundredth of a percent, where -5% reflects Conduent results that were within the range from 0.00% to -4.99% compared to CalPERS results, where -10% reflects Conduent results within -5.00% to -9.99% of CalPERS results, etc.