

TEACHERS' RETIREMENT BOARD

REGULAR MEETING

SUBJECT: Impact of Further Delays in Funding
Defined Benefit Program Shortfall

ITEM NUMBER: 8

CONSENT:

ATTACHMENT(S): 1

ACTION:

DATE OF MEETING: February 6, 2014 / 60 mins.

INFORMATION: X

PRESENTER(S): Ed Derman

PURPOSE

The purpose of this item is to review the financial implications of continuing delays in addressing the shortfall in the Defined Benefit Program.

BACKGROUND

As of June 30, 2012, the Defined Benefit (DB) Program had an unfunded liability of about \$71 billion, an amount that would increase by about \$22 million for each day in 2012-13 that contribution rates were not increased to amortize the shortfall, assuming the DB Program met its actuarial assumptions. Although the board has stated that the definitive approach to addressing the shortfall is an increase in contributions necessary to fully fund the program in 30 years, the board has recognized that the Legislature and the Governor could address the shortfall with a series of incremental contribution rate increases imposed on members, employers and/or the state, with the first increase taking place in a future year. The June 30, 2012, valuation identified the total required contribution if the increase occurred in one step, but was implemented in different years between 2012 and 2027, with full funding occurring 30 years after the contribution rate increase became effective. As the valuation indicated, delaying implementation significantly enlarges the required increased contribution rate from an additional 14.6 percent of pay, if the increase occurred in 2012, to an additional 23.7 percent of pay, if the increase was delayed until 2027.

The Governor's Budget proposes that the Governor, Legislature, employers and member organizations begin working on a funding plan, to be enacted as part of the 2015-16 budget that gradually increases contributions paid by the state, employers and members to fully fund the DB Program within 30 years. This item provides information that will facilitate development of that plan by identifying the implications of deferring the contribution rate increases to future years, either by having the rate increase take effect in different years, or having those rates increase at differing amounts per year. The analysis is based on the results of the June 30, 2012, valuation, but also reflects the impact of the 13.8 percent investment return in 2012-13.

ANALYSIS OF IMPACT

As the attached analysis from Milliman indicates, the 13.8 percent return in 2012-13 did have a positive impact on the long-term funding needs of the DB Program. The additional contribution needed to be 100 percent funded within 30 years of the beginning of the increased contribution declined from an additional 16.1 percent, if the DB Program had earned 7.5 percent in 2012-13 and annually thereafter and if the increase occurred in 2015, to an increase of 14.17 percent, given that the DB Program earned 13.8 percent in 2012-13. Nonetheless, the impact of delayed implementation continues to be significant. According to the Milliman analysis, every two-year delay increases the required increase in contribution rates by a minimum of 0.9 percentage points of compensation (or about \$15 billion in additional contributions over 30 years), with the requirement increasing by an enlarging percentage of pay as implementation continues to be delayed. By 2021, the increase in the required contribution rate would grow by over one percentage point of compensation with a further two-year delay in the increase.

These figures assume that CalSTRS meets its investment return assumption of 7.5 percent annually each year. If there is a substantial slowdown in the market for the next two years, the required contribution rate increases significantly. For example, the DB Program realizes a 0 percent return in both 2014-15 and in 2015-16, a return that, based on the DB Program asset allocation will occur once in every five two-year periods, the required increase in contribution rates in 2014-15 to achieve 100 percent funding in 30 years increases from 14.17 percent, if the DB Program earns 7.5 percent annually, to 18.38 percent, if the DB Program earns a 0 percent return in both 2014-15 and 2015-16, but 7.5 percent annually thereafter. Similarly, the marginal impact of delaying implementation has a greater impact on the required contribution rate increase if there is a market downturn. Rather than having the required contribution rate increasing by a range of 0.9 percentage to over one percentage point for every two-year delay, the required increase enlarges by a range of 1.18 percentage points to 1.41 percentage points for every two-year delay if there is a market downturn.

Implementation Date of July 1	Meet Actuarial Assumption		0% Return in 2014-15 and 2015-16	
	Increase in Contribution Rate Needed (First Year Cost in Billions)	Increase From Prior Implementation Date	Increase in Contribution Rate Needed (First Year Cost in Billions)	Increase From Prior Implementation Date
2015	14.17% (\$4.2)		18.38% (\$5.5)	
2017	15.08% (\$4.8)	0.91%	19.56% (\$6.3)	1.18%
2019	16.06% (\$5.5)	0.98%	20.87% (\$7.2)	1.31%
2021	17.11% (\$6.3)	1.05%	22.28% (\$8.3)	1.41%

Delaying implementation, although providing short-term savings for those who contribute to the DB Program, has long-term fiscal consequences to those same entities because the required contribution rate would be higher if implementation is delayed. For example, if the DB Program earns 7.5 percent annually in its investments, delaying implementation of a contribution rate increase from 2015 to 2017 would increase the amount spent in 2017-18 on higher contributions

by about \$300 million. That amount would increase each year thereafter as compensation subject to the increased contribution increased. The additional amount spent in 2029-30 due to the two-year delay would equal over \$450 million. If the DB Program has no investment earnings in the next two years, the increased cost of delay would be almost \$375 million in 2017-18 and almost \$600 million in 2029-30.

Similarly, delaying full implementation of a contribution rate increase by extending the length of time that the increases are phased in would affect long-term costs. The table below shows how the ultimate final contribution rate would be affected by differing annual rates of increase, if the first rate increase takes place in 2015, assuming both a 7.5 percent annual investment return and a 0 percent return in both 2014-15 and in 2015-16. Similar to the impact of delayed implementation, more gradual increases in contribution rates also result in larger long-term costs. The difference between a 3 percent annual total increase in contribution rates, and a 4 percent annual total increase would be \$225 million in 2020-21, when the ultimate contribution rate would be in effect, and almost \$315 million in 2029-30, if the DB Program earns 7.5 percent annually. If the DB Program has no investment earnings in the next two years, the increased cost of a more gradual increase in contribution rates would be about \$475 million in 2022-23, when the ultimate contribution rate would be in effect, and over \$600 million in 2029-30.

Annual Total Rates of Increase Beginning in 2015	Meet Actuarial Assumption		0% Return in 2014-15 and 2015-16	
	Ultimate Increase in Contribution Rate Needed	Difference From Lower Rate of Annual Increase	Ultimate Increase in Contribution Rate Needed	Difference From Lower Rate of Annual Increase
3%	15.95%		21.78%	
4%	15.32%	-0.63%	20.55%	-1.23%
5%	14.96%	-0.36%	19.90%	-0.65%
6%	14.78%	-0.18%	19.54%	-0.36%

Another measure of the increased risk to the DB Program of increasing delays in a contribution rate increase is the impact on the funded ratio. Page 3 of the Milliman analysis has two graphs that show how the funded ratio changes over time with a delayed implementation of a contribution rate increase in different years with different investment markets during the next two years. As the graphs indicate, the funded ratio will continue to decline until the increased contribution rates are implemented. The table below shows the lowest funded ratio occurring in the DB Program, based on different implementation dates and short-term investment experience. The reduction in the funded ratio when the market underperforms increases each year that implementation is delayed, and would approach or be under 50 percent if implementation was delayed to 2019 or beyond.

2015 Implementation		2017 Implementation		2019 Implementation		2021 Implementation	
Meet Actuarial Assumption	0% Return in 2014-15 and 2015-16	Meet Actuarial Assumption	0% Return in 2014-15 and 2015-16	Meet Actuarial Assumption	0% Return in 2014-15 and 2015-16	Meet Actuarial Assumption	0% Return in 2014-15 and 2015-16
64%	60%	62%	55%	60%	51%	57%	47%

CONCLUSION

No matter how it is measured, the risk associated with excessive delays in implementing the funding solution for the DB Program shortfall is that the cost of that solution could result in contribution rates that would have a major impact on the budgets of those who pay those contributions. Historically, most of the resources available to the DB Program derive from the earnings generated by investing contributions. If the receipt of those contributions is delayed, there is less time to generate those earnings. As a result, to secure the resources needed to pay the benefits owed to members, the amount contributed will have to increase. Although contribution rate increases can be phased in over a period of time to allow budgets to adapt to the increased costs, the longer that phase-in period, the more it ultimately costs future budgets. As was stated in the [report submitted to the Legislature pursuant to Senate Concurrent Resolution 105](#), however, “[b]etween the timing of the contribution rate increase and the number of years over which that increase takes place, the rate of speed of the increase in contribution rates can have a more substantial impact on the effectiveness of a contribution rate increase than would the commencement of the increase, if the contribution rates are increased significantly.”



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January 14, 2014

Teachers' Retirement Board
 California State Teachers' Retirement System

Re: Impact of FYE2014 & FYE2015 Return on CalSTRS' Projected Funded Status

Dear Members of the Board:

Per staff's request, we have estimated the impact certain asset returns in the following two fiscal years would have on CalSTRS' projected funded status. Specifically, we have looked at how various returns would affect the additional contributions needed for CalSTRS to be projected to reach a 100% funded ratio over a 30-year period.

Current DB Program Status

As of the June 30, 2012 actuarial valuation, the DB Program had an unfunded actuarial obligation (UAO) of approximately \$71 billion, and the UAO was expected to increase each year going forward. To pay off the UAO over a 30-year period beginning in 2012, the additional revenue needed was 14.6% of payroll. If action was delayed until July 1, 2015, the calculated additional revenue needed increased to 16.1% of payroll. The actual return for CalSTRS for the fiscal year ended June 30, 2013 (estimated to be 13.8%) significantly exceeded the assumed 7.5% return; however, even after reflecting this, an increase in contributions of 14.2% of payroll would still be needed as of July 1, 2015 to have a projected funded ratio of 100% as of June 30, 2045.

Study Results – Additional Revenue Needed for Various Implementation Dates

Actual future returns will continue to affect the additional revenue needed. Per your request, we have shown the additional revenue needed under two return scenarios and four different implementation dates for the additional contributions. The following chart shows the additional funding needed beginning on the given effective date for CalSTRS to be projected to be 100% funded in 30 years from the implementation date. The return in all years is assumed to be 7.5%, except for FYE2015 and FYE2016 in the 0.0% return scenario.

Contribution Increases Projected to Meet Specific Funding Targets				
Returns in FYE2015 & FYE2016	Additional Contribution Needed to Meet 100% Funded Target Based on July 1, 20XX Implementation Date			
	2015	2017	2019	2021
7.5%	14.17%	15.08%	16.06%	17.11%
0.0%	18.38%	19.56%	20.87%	22.28%

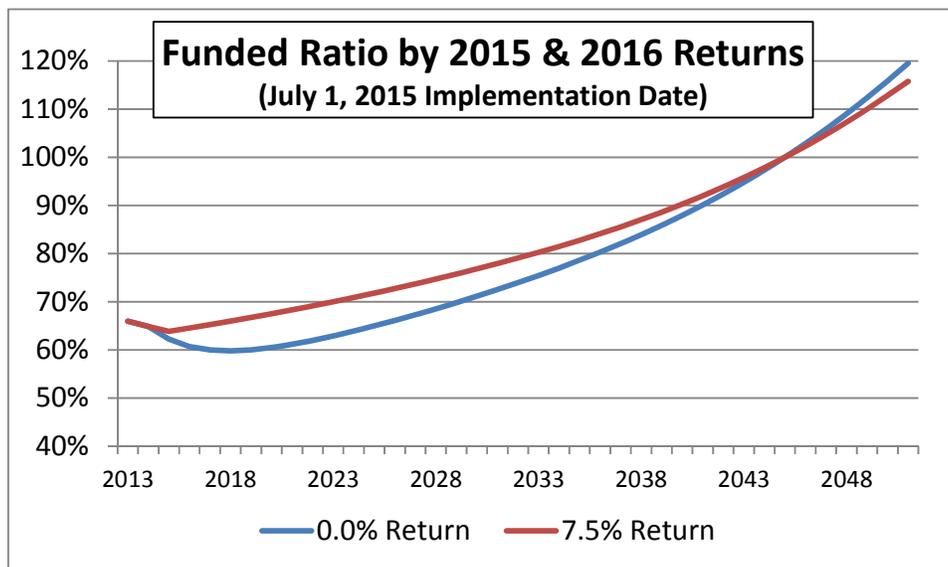
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Note that the additional contribution needed is shown as a percentage of payroll and is in addition to the currently scheduled contribution rates payable to the DB Program of approximately 20% of payroll (8.00% employees / 8.25% districts / 3.522% state ultimate rate).

The return scenarios shown are those specifically requested by CalSTRS staff. It should be noted that the 0.0% return is approximately equivalent to the 80th percentile return over the two-year period, which you requested. The 80th percentile indicates that there is approximately an 80% probability that the average return over the next two years will equal or exceed 0.0%. This analysis of the return percentile is based on Milliman's capital market assumptions for June 30, 2013 and CalSTRS current target asset allocation.

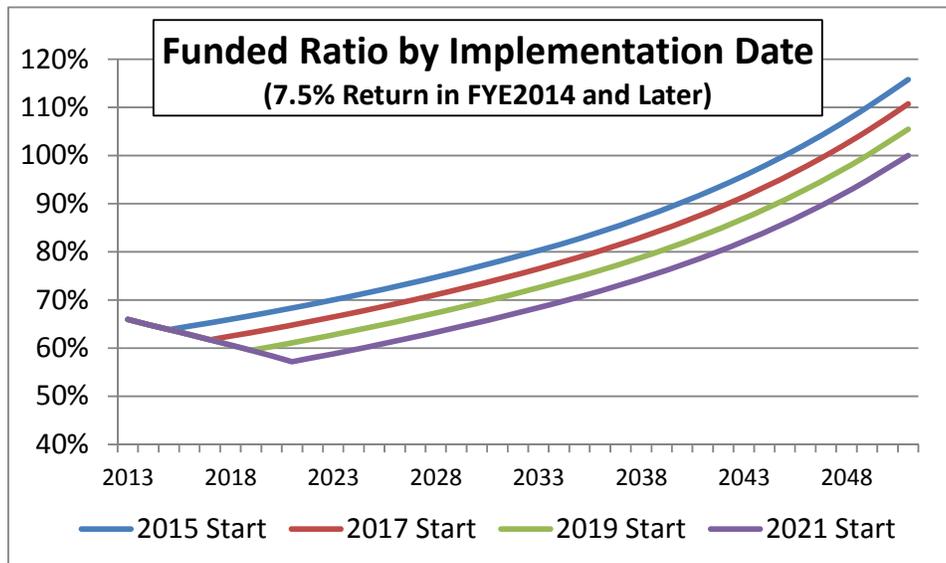
Study Results – Projected Funded Ratio

The actual returns over the next two years will have a significant impact on CalSTRS' funded ratio in the short term. The following graph shows how the funded ratio is projected to dip below 60% over the next few years if the return for the next two years is 0.0%. Note that in each case the funded ratio is projected to be 100% at June 30, 2045, as each scenario assumes there will be adequate additional revenue; however, scenarios with the lower initial returns will require a larger contribution rate increase.

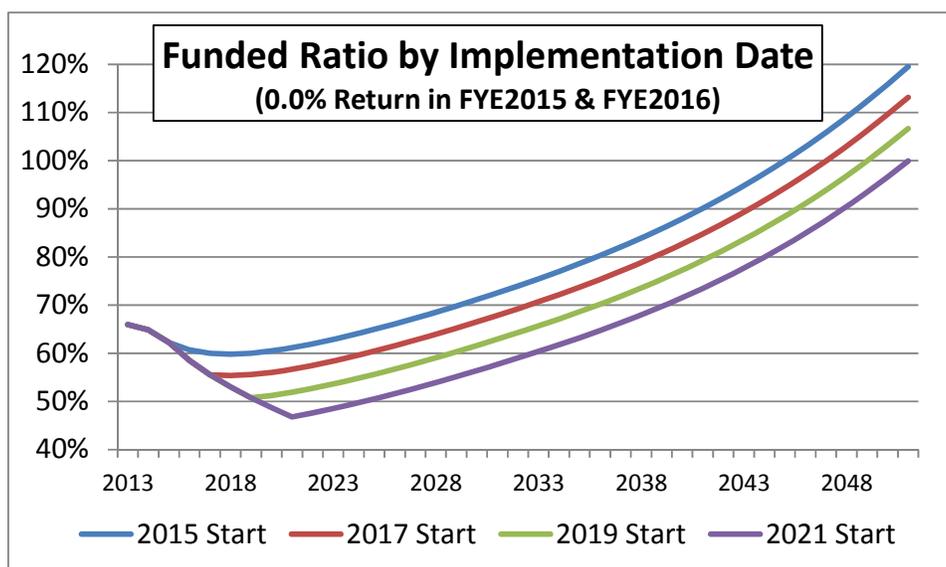


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Similarly, when the contribution rates increase occurs will also have a significant impact on CalSTRS' funded ratio. The following graph shows how the projected funded ratio is about 5% lower for each two years the implementation date is delayed, even with the higher contribution rates calculated for the later implementation dates.



Combining a delayed implementation date with lower than expected returns results in a further decline in the funded ratio. As shown in the following graph, the funded ratio is projected to decrease below 50% if the return is 0.0% in the following two years and the implementation date of the contribution rate increase is delayed until 2021.



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Study Results – Additional Revenue Needed for Various Rates of Increase

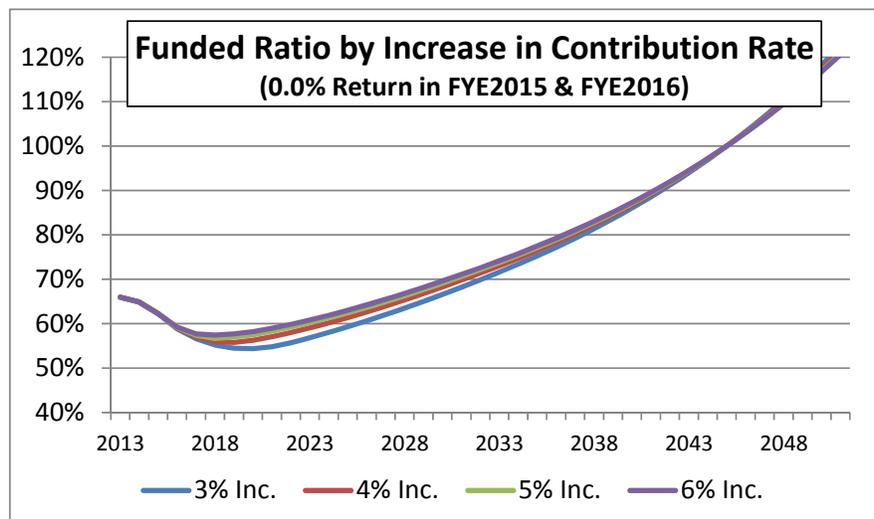
As shown in the previous example, how quickly a funding solution is implemented will impact the ultimate increase needed. Per your request, we have shown the additional revenue needed under two return scenarios and four different rates of increase in the additional contributions. The following chart shows the additional funding needed beginning on July 1, 2015 for CalSTRS to be projected to be 100% funded in 30 years based on different rates of increase. For example, in the 7.5% return scenario, annual increases of 3% per year would be needed until the total increase in the contribution rate was 15.95% (approximately 6 years). The return in all years is assumed to be 7.5%, except for FYE2015 and FYE2016 in the 0.0% return scenario.

Contribution Increases Projected to Meet Specific Funding Targets				
Returns in FYE2015 & FYE2016	Additional Contribution Needed to Meet 100% Funded Target Based on July 1, 2015 Implementation Date and X% Annual Increase			
	3%	4%	5%	6%
7.5%	15.95%	15.32%	14.96%	14.78%
0.0%	21.78%	20.55%	19.90%	19.54%

Note that the additional contribution needed is shown as a percentage of payroll and is in addition to the currently scheduled contribution rates payable to the DB Program of approximately 20% of payroll (8.00% employees / 8.25% districts / 3.522% state ultimate rate).

Study Results – Projected Funded Ratio

The following graph shows the projected increase in the funded ratio under the four alternative contribution increase scenarios (if the return for the next two years is 0.0%). Note that in each case the funded ratio is projected to be 100% at June 30, 2045, as each scenario assumes there will be adequate additional revenue. Scenarios with the lower initial contribution increases will initially have lower funded ratios, although the difference is not as significant as delaying the implementation date.



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Actuarial Assumptions

All data, methods, and assumptions are the same as those used in our June 30, 2012 actuarial valuation of the DB Program, with the following supplemental assumptions used in the projection of funding.

- The actual investment return for the year ended June 30, 2013 has been reflected in the projections. CalSTRS has estimated this to be 13.8%. Variable returns for fiscal year ended 2015 and 2016 are assumed as described in this letter. The return in FYE2014 and all future returns after 2016 are assumed to be 7.5% each year.
- All new hires after December 31, 2012 are assumed to receive the lower benefits specified in the California Public Employees' Pension Reform Act of 2013 (PEPRA). Please see our letter dated October 23, 2012 for details.
- The amortization calculation assumes that the full percentage of total payroll will be used to fund the UAO. A 1% of payroll contribution made by the state does not equate to a 1% contribution on the current payroll (which we have shown in our calculations) as it is made on an older payroll; a percent of payroll contribution made by the members is less valuable, because there is some probability these contributions will be refunded to the member. Therefore, to the extent additional contributions came from these sources, a higher percentage of payroll would be needed.

Actuarial Certification

All data, methods, and assumptions are the same as those used in our June 30, 2012 actuarial valuation of the DB Program, except where noted. Please refer to those reports for further details. It should be noted that member behavior may change as a result of PEPRA. We have not anticipated any changes in member behavior in the assumptions used in our analysis.

In preparing the valuation upon which this letter was based, we relied without audit, on information (some oral and some in writing) supplied by CalSTRS staff. 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. It should be noted that if any data or other information is materially inaccurate or incomplete, our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for CalSTRS have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of CalSTRS and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting CalSTRS.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: 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

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perform an analysis of the potential range of future measurements. The Retirement Board has the final decision regarding the appropriateness of the assumptions and adopted as shown in Appendix B of the 2012 Valuation report. Please see our letter dated October 23, 2012 for additional details regarding the assumptions and methods used in our PEPRA analysis.

Actuarial computations presented in this report are for purposes of assessing the funding impact of various return scenarios. Determinations for other purposes may be significantly different from the results contained in this letter. Accordingly, additional determinations may be needed for other purposes.

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- (a) CalSTRS may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.
- (b) CalSTRS may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

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. These possible changes should be reviewed by counsel. Note that we have not explored these or any other legal issues with respect to the potential changes in contribution rates.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this cost study letter is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We 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 this analysis and we look forward to discussing it with you.

If you have any questions, please contact us.

Sincerely,

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

Nick J. Collier, ASA, EA, MAAA
Principal and Consulting Actuary

NJC/nlo

Enclosure

cc: Mr. Ed Derman
Mr. Rick Reed
Mr. Mark Olleman