

BEFORE THE
MARYLAND STATE BOARD OF CONTRACT APPEALS

In The Appeal of)
Milliman, Inc.)
)
Under MSRPS Contracts) Docket No. MSBCA 2609
for Actuarial Services)
Dated July 1, 1982,)
July 1, 1990, July 1, 1993,)
& August 4, 1998)

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OPINION BY BOARD MEMBER DEMBROW

This appeal seeks review of a final agency determination that petitioner breached contracts for the delivery of actuarial consulting services performed for the Maryland State Retirement and Pension Systems (MSRPS). Specifically, MSRPS asserts that beginning in 1982, petitioner made a coding interpretation error regarding the form and consequent duration of retirement benefits payable on behalf of certain public employees and that error was replicated annually for the next twenty-two (22) years until it

was finally discovered in 2004. As a result of this longstanding mistake, it is alleged that petitioner undervalued the amount of the obligations required by statute to be contributed toward three (3) of the State's ten (10) retirement and pension systems fully to amortize liability, namely, those established for judges and police; and because those particular retirement systems were inadequately funded from 1982 until 2004 as a result of petitioner's faulty advice to MSRPS contrary to and in violation of the appropriate professional standard of care, damages were sustained. While the coding error is admitted, MSRPS's allegation of breach of actuarial responsibility is vigorously contested by experts testifying on opposite sides of that issue.

Findings of Fact

1. The Maryland State Retirement and Pension System (MSRPS) is part of the executive branch of state government and is managed by a Board of Trustees comprised of fourteen (14) persons who serve as unpaid fiduciaries of the State's retirement funds, including five (5) elected members, each representing different retirement systems within the State system, six (6) members appointed by the governor, one of whom must be a member of the system and five (5) who cannot themselves be members of any State retirement system, as well as three (3) State officials who serve *ex officio*, namely, the Secretary of Budget and Management (DBM), the State Comptroller, and the State Treasurer. (State Personnel and Pensions Article of the Annotated Code of Maryland (SP&P) §§21-104(a), 21-201(b)(1), 21-203; State Treasurer Nancy Kopp (Kopp), Tr. (referencing trial testimony transcript volume and page number) II-101; Former Delegate Tim Maloney, Esq. (Maloney), Tr. VIII-40, 81.)
2. The State Treasurer is the custodian of MSRPS funds which are held and invested separately and apart from other State funds. (SP&P §§21-108, 124.)

3. MSRPS maintains its accounts separate and apart from the State's General Fund and other State funds because it holds its assets in trust on behalf of the participants of the various State retirement and pension systems. (SPP §21-123(b)(1); Respondent's Ex. No. 2; Kopp, Tr. II-115; MSRPS Board Member Major Morris Krome (Krome), Tr. III-10; Maloney, Tr. VIII-84.)
4. While the State's General Fund assets are invested in liquid or short-term instruments, MSRPS assets held in trust independent from the State's General Fund in accordance with MSRPS formal investment policy are ordinarily placed in highly rated safe financial institutions as constrained by the permissible investments list and are expected to earn significantly higher long-term rates of return than short-term assets held in the General Fund. (Deputy Treasurer of Maryland Anne Melissa Moye, Ph.D. (Moye), Tr. IX-89, 108.)
5. For fiscal years 1984 thru 2005, the mean average rate of return for monies invested short-term in the State's General Fund was 5.62% while the average rate of return for monies invested long-term by MSRPS over the same period of time was 11.10%, nearly double the rate of return for the State's short-term General Fund asses. (Respondent's Exhibit Nos. 22, 23, 25, 26; Moye, Tr. IX-97.)
6. MSRPS now consists of several independent retirement systems, namely: (1) the Correctional Officers' Retirement system, established July 1, 1974; (2) the Employees' Pension System, established January 1, 1980; (3) the Employees' Retirement System, established October 1, 1941; (4) the Judges' Retirement System, which includes a noncontributory plan established on April 7, 1904 and a contributory plan established on July 1, 1969; (5) the Legislative Pension Plan; (6) the Local Fire and Police System, established July 1, 1989; (7) the Law Enforcement Officers' Pension System (LEOPS), established on July 2, 1990; (8) the State Police

Retirement System, established on July 1, 1949; (9) the Teachers' Pension System established January 1, 1980; and (10) the Teachers' Retirement System, established August 1, 1927. (SP&P §21-102.)

7. Each fund within MSRPS is accounted for separately and transfer of funds between the constituent systems held in trust by MSRPS is statutorily prohibited. (SPP §21-301; Kopp, Tr. II-109.)
8. Of the ten (10) aforementioned pension and retirement systems that currently exist as more fully set forth from SP&P § 21-102 above, in 1982 there were only six (6) systems within MSRPS, including nos. 4 and 8 above, for State judges and State police, respectively.
9. The vast majority of the participants in the various retirement systems managed by MSRPS receive a straight life annuity (SLA, also referred to as a single life annuity) as the normal form of payment, but some of the systems also offer to their participants a joint 50% benefit for surviving spouses (J&S) as the normal form of payment, namely, the retirement systems for judges and police. (Article 73B § 56(d), Maryland Annotated Code, 1982, for judges' retirement benefits and Article 88B § 53, Maryland Annotated Code, 1982, for police retirement benefits; Pages 43, 47, Tab 28, Rule 4 File; Tabs 29, 73, Rule 4 File; Krome, Tr. III-13; Mowery, Tr. III-129; Custis, Tr. VII-107; E. 727, 739.)
10. Specifically, not counting the legislative retirement plan, of the ten (10) State retirement and pension systems set forth in SP&P § 21-102 and listed above, the three (3) retirement systems within MSRPS which offer or have offered automatic benefits payable to a surviving spouse without special election and expense are those for judges, law enforcement officers, and State police, identified respectively as Nos. 4, 7 and 8 above, each of which offers

and offered a 50% continuing benefit to the surviving spouse of a retiree in addition to the straight life annuity payable directly to the retiree until death.

11. The Maryland legislators' retirement and pension plan also includes the added J&S benefit, but because it is merged into the State employee retirement and pension system, the damages accruing to the legislative retirement and pension system are not separately quantified and therefore not made a part of the MSRPS claim against Milliman that is the subject of this appeal.
12. Also as set forth in the above recital from SP&P § 21-102, the judges' retirement system and the State police retirement system existed prior to 1982, while the law enforcement officers' pension system (LEOPS), covering certain local and special law enforcement agencies, was not created until 1991 as an enlargement of another more specialized retirement system established the year prior only for police personnel of the State Department of Natural Resources (DNR).
13. With respect to LEOPS, the most recently created of the three (3) affected systems here at issue, the funds held in trust by MSRPS include not only contributions from the State of Maryland as employer but also from a variety of other governmental employers such as local governments. (SPP § 21-309(c).)
14. The extra 50% spousal retirement benefit enjoyed by police officers is well known to employees engaged in that profession and attributed to the unique powers and risks associated with police work, justifying increased retirement benefits. (Krome, Tr. III-11.)
15. Certain public employees other than police officers, including educators, can opt for a survivor benefit instead of the SLA normal form of retirement payment, but the additional cost incurred by the exercise of that option is

offset and satisfied by a reduction in the amount of the retiree's benefits. (Krome, Tr. III-14; Thomas K. Custis, F.S.A. (Custis), Tr. VI-49.)

16. As a result of reforms to the State's retirement and pension systems implemented in the late 1970's in response to substantial concern over the potential of a public pension funding crisis foreseen at that time as a result of uncapped cost of living adjustments (COLA) then in force, the State enacted legislation in 1979 mandating full actuarial funding of MSRPS obligations in order to assure over the course of the following forty (40) years that all state employee retirement obligations would be fully funded by the year 2020. (1979 Laws of Maryland, Chaps. 23, 24; Maryland State Teachers Assoc., Inc. v. Hughes, 594 F.Supp. 1353 (D.Md. 1984); Tabs 97-99, Rule 4 File; Kopp, Tr. II-110; Custis, Tr. VI-25; Maloney, Tr. VIII-42, 48; E. (referencing the page number of respondent's two-volume Record Extract filed July 31, 2009) 667, 668.)
17. MSRPS is a "defined benefit" system by which the State guarantees the benefits paid to retirees, in contrast to a "defined contribution" system, by which an employer would commit to paying a certain amount into the retirement funds, but not guarantee the benefits ultimately paid to retirees. (Custis, Tr. VI-8.)
18. MSRPS is mandated by statute to designate an actuary to give it technical advice and provide an annual valuation of the assets and liabilities of the funds of the several state retirement systems based on actuarial assumptions adopted by the MSRPS Board of Trustees. (SP&P §21-125.)
19. SP&P 21-109 provides: "The Board of Trustees [of MSRPS] shall submit the budget for the several systems annually to the Governor for inclusion in the State budget."
20. Each year MSRPS is required by statute to certify to the DBM secretary and to the governor the required rates of State

contributions to the retirement systems necessary for allocation in the coming fiscal year for the State to remain on track to achieve full funding of future payment obligations as targeted by statute. (SP&P §21-125(b); Custis, Tr. VII-57; Maloney, Tr. VIII-87.)

21. Specifically, State law provides: "Beginning July 1, 2001, each year the Board of Trustees shall set contribution rates for each State system that shall amortize: (i) all unfunded liabilities or surpluses accrued as of June 30, 2000, over 20 years; and (ii) any new unfunded liabilities or surpluses that have accrued from July 1 of the preceding fiscal year over 25 years to reflect: 1. experience gains and losses; 2. the effect of changes in actuarial assumptions; and 3. the effect of legislation effective on or after July 1, 2001." (SP&P §21-304(d)(1).)
22. The essential purpose of annual actuarial valuations is to project an estimate of future liabilities of the retirement systems in order to establish a level of present year funding contributions sufficient to satisfy those liabilities. (Krome, Tr. III-20; Custis, Tr. VI-27.)
23. Like most state retirement systems, the Maryland State retirement systems are designed to be "pre-funded" rather than "pay-as-you-go," the intent of which is to reduce costs and increase the return on investment while at the same time avoiding the possibility of incurring unfunded retirement or pension liability. (Kopp, Tr. II-109; Moye, Tr. V-10, 22; Kimberly Nicholl, F.S.A. (Nicholl) Tr. IX-20.)
24. Another deliberate design element of Maryland's advance funded retirement systems is to achieve "inter-generational equity" by requiring those who receive future benefits to pay the cost of those future benefits during the course of their employment, rather than transferring the cost of future liabilities to future generations. (Kopp, Tr. II-

- 112; Moyer, Tr. V-13; Nicholl, Tr. IX-20; Jeremy Gold, F.S.A. (Gold), Tr. IX-193; E. 532, 533.)
25. There are three (3) sources of revenue held in trust by MSRPS for payment of retirement and pension obligations: (1) the State of Maryland as employer, (2) the individual employees, and (3) income derived from fund investments.
 26. The annual budgetary allocation by the Governor to the state retirement systems as certified by MSRPS based on the recommendation of its actuary is subject to annual appropriation from the General Fund by the General Assembly. (Article III, Section 52, Constitution of Maryland; Maryland Action for Foster Children, Inc. v. State, 279 Md. 133, 367 A.2d 491 (1977); Maloney, Tr. VIII-41; Boland, Tr. X-63.)
 27. The pension and retirement appropriations proposed by the Governor in the annual State budget are made separately for each system. (SPP §21-308(a)(2)(i).)
 28. The State is guarantor of the payment of MSRPS pension and retirement benefits and therefore has an obligation to fund the retirement and pension benefits it owes. (SPP §21-302; Kopp, Tr. II-143; Moyer, Tr. V-39; Krome, Tr. II-48; Maloney, Tr. VIII-70, 81.)
 29. By consistent custom over the course of history in Maryland prior to 2002, neither the Governor nor the General Assembly attempted to change the contribution rates to the State retirement systems as recommended by MSRPS based upon the contribution rate established by its actuary. (Kopp, Tr. II-124; Maloney, Tr. VIII-41, 57.)
 30. For the first time, the State's 2002 Budget Reconciliation and Financing Act (BRFA) included only "corridor funding" of the State's retirement and pension obligations, such relaxation of the custom of minimum funding requisites adopted in prior budget practice newly affording the Governor and General Assembly extra discretion in allocating retirement funding not with precision but instead, within a

- 10% variance, higher or lower, from MSRPS recommendation. (Kopp, Tr. II-127; Kalwarski, Tr. XI-78.)
31. Although corridor funding did not apply to the three (3) comparatively smaller pension systems here at issue, but instead, only to the larger pension systems, the 2002 shift to corridor funding represented a significant change in state budgeting practices, which MSRPS opposed but which its actuary, appellant, acting within the scope of a separate contract for a separate State agency, supported. (Respondent's Ex. Nos. 5, 17; Tab 157, Rule 4 File; Kopp, Tr. II-129; Krome, Tr. III-42; Maloney, Tr. VIII-89; Kalwarski, Tr. XI-121; E. 23.)
32. Milliman & Robertson, Inc. is the predecessor in interest to Milliman, Inc., also known as Milliman Global USA and Milliman USA, each and all of which are herein referred to as "Milliman."
33. In 1981 MSRPS was confronted with the potential of billions of dollars in future unfunded retirement liabilities and was dissatisfied with the actuarial services being provided to it at that time by its then actuary, George Buck Consulting Actuaries, Inc. (Buck).
34. In this time frame MSRPS sought actuarial advice with the goal of establishing an amortization schedule that would level the percentage of payroll required fully to fund retirement obligations and stabilize contribution rates or at least minimize the likelihood of wild fluctuations in contribution rates from year to year.
35. The initial 1982 procurement solicitation issued by MSRPS for actuarial services was a Request for Proposals (RFP) which specifically sought evaluations of "Pensions for Judges and Their Surviving Spouses" among other actuarial valuation tasks. (Respondent's Ex. 11 at §3-A-6; Tab 31, Rule 4 File; Brent Mowery, F.S.A. (Mowery), Tr. III-60, 108; E. 746.)

36. In response to this MSRPS solicitation for actuarial services, by correspondence dated March 19, 1982, Milliman proposed to perform the actuarial accounting services MSRPS sought. (Respondent's Ex. No. 11; Tab 1-A, Rule 4 File; Custis, Tr. VI-12, E. 500.)
37. Milliman was awarded the MSRPS contract for actuarial services in 1982 for which Milliman was paid \$96,000 for services rendered during the first year of the contract. (Custis, Tr. VI-16.)
38. Between July 1, 1982 and August 4, 2006, Milliman entered into four (4) contracts with MSRPS to provide professional actuarial services including valuations of the various MSRPS pension and retirement systems, culminating in an annual certification of the employer contribution rate required to fund each retirement system for the coming year. (Tabs 1-4, Rule 4 file.)
39. Each of the aforesaid actuarial contracts entered into between MSRPS and Milliman contained a Disputes Clause that subjected the contracts to dispute resolution pursuant to the State Finance and Procurement Article of the Maryland Annotated Code (SF&P) §15-215 *et seq.* and the Code of Maryland Regulations (COMAR) §21.10.
40. A Fellow of the Society of Actuaries (F.S.A.) is the highest designation of competence and proficiency in the actuarial profession, enjoyed only by those actuaries who pass ten (10) examinations. (Mowery, Tr. III-60, 108.)
41. Milliman proposed four (4) fellows of the Society of Actuaries to have supervisory responsibility in the performance of actuarial advice to MSRPS namely, Thomas P. Bleakney, F.S.A., Fenton R. Isaacson, F.S.A., Eugene M. Kalwarski, F.S.A. (Kalwarski), and Thomas K. Custis, F.S.A. (Custis). (Page 5, Tab 1-A, Rule 4 file; Custis, Tr. VI-13, VII-65, 70; Kalwarski, Tr. XI-8.)

42. In 1982 Kalwarski was a new employee of Milliman hired to develop its office in Washington, D.C., which opened in June 1981. (Custis, Tr. VI-15, VII-75; Kalwarski, Tr. XI-97.)
43. Most of Milliman's actuarial work for MSRPS was performed in its new D.C. office as well as its home office in Milwaukee, Wisconsin, with data extraction by computer processing performed through a separate entity known as M&R Services, Inc. (M&R) which operated out of an office in Seattle, Washington using a mainframe computer located there for which the use of computer resources was charged to Milliman based upon the computing time required for the work conducted, which totaled about \$20,000 for the computerized data processing services required to perform the MSRPS contract in 1982-83, a sum higher than initially anticipated. (Tabs 46, 84, 110, Rule 4 File; Custis, Tr. VI-15, 34, VII-78, 81, 133; E 909.)
44. At the inception of the Maryland contracts here at issue, Milliman had a protocol in place to handle communications between Milliman and MSRPS, but no formal documented policies or protocols governing prescribed methods of information sharing between employees working out of different Milliman offices. (Tab 47, Rule 4 File; Custis, Tr. VII-69, 83; Kalwarski, Tr. XI-11.)
45. Milliman's 1982 actuarial proposal to MSRPS provided: "We subscribe to the concept that the annual actuarial valuations are the cornerstone of all financial planning of a retirement system. As such we take great care in assuring that all technical aspects of the valuation are completed accurately..." (Page 16, Tab 1-A, Rule 4 file; Custis, Tr. VII-45, 72.)
46. When MSRPS initially determined to retain Milliman in 1982 to satisfy its actuarial needs, that decision was based in part by MSRPS's reasonable reliance upon Milliman's assurances that it was a firm presenting a "national

reputation of integrity and work of the highest professional standards" with "internal quality control procedures in the pension area," that "[a] plan of peer review has been established under which the work of each actuary is periodically reviewed by another actuary," and that Milliman would "take great care in assuring that all technical aspects of the valuation are completed accurately, and equal care that the results are presented in an understandable and meaningful manner." (Tab 1A, Rule 4 File.)

47. At the start of its first contract with MSRPS, Milliman's staff at its new D.C. office consisted only of Kalwarski and one (1) actuarial student, namely, Martha Moeller (Moeller), neither of whom had prior professional experience valuing large multi-employer public pension systems. (Custis, Tr. VII-75; Moeller, Tr. VII-160; Kalwarski, Tr. XI-103.)
48. Milliman presented its first written actuarial reports and recommendations to MSRPS on November 30, 1982 and its first oral presentation to MSRPS was made on February 8, 1983. (Tabs 89, 102, Rule 4 File; Custis, Tr. VII-142.)
49. Milliman determined MSRPS total actuarial liability to be approximately \$8.1 billion in 1982, a figure considerably greater than Buck's calculation the preceding year of only \$7.3 billion. (Custis, Tr. VI-83, VII-17.)
50. Approximately \$600 million of the \$800 million difference between 1981 and 1982 in increased liability calculated by Milliman was attributed to teachers' retirement and pension funds obligations, and approximately \$100 million of the increased liability was attributed to State employees. (Tab 236, Rule 4 File; Custis, Tr. VI-83, VII-10.)
51. In stark contrast to the two (2) larger MSRPS retirement systems referenced above for teachers and state employees, Milliman's calculation of the total liability for State Police increased only slightly, by about \$14 million, or 7%,

- from \$194,464,819 to \$208,497,000. (Tab 236, Rule 4 File; Custis, Tr. VI-84.)
52. Naturally, the focus of most all of the persons concerned about the funding status of the State's retirement plans when Milliman first undertook its work for MSRPS was on the dramatic increase in liability of the State's larger plans such as those for teachers and state employees, rather than the smaller plans such as those only for judges and police.
53. As a result of its actuarial calculation of increased liability in 1982, Milliman recommended that MSRPS dramatically increase the State's contribution to state employee retirement funds, from approximately \$329 million to approximately \$432 million annually, an increase of \$103 million, slightly more than 30%, from the recommendations of MSRPS's predecessor actuary, Buck. (Tab 102, Rule 4 File; Custis, Tr. VII-13; Nicholl, Tr. IX-54.)
54. On February 28, 1983 Milliman's written valuation report assured MSRPS that its calculated contribution rate of 14.07% of payroll for State Police was "sufficient to fully liquidate the unfunded accrued liability as of June 30, 1982, or \$111,085,000, within 38 years from June 30, 1982." (Tab 42, Rule 4 File; Custis, Tr. VII-153; E. 804, 823.)
55. To place into perspective the comparative insignificance of Milliman's coding error, if Milliman had correctly calculated the total liability for the State Police retirement and pension fund in 1982, Milliman's correction of Buck's calculation of \$194 million should have risen an additional 3.5% to about \$215 million, rather than only 7% to about \$208 million, as Milliman did recommend and certify. (Custis, Tr. VI-88.)
56. Milliman's valuation report to MSRPS on the State Police plan that year did not include a summary of that plan's provisions as required by Milliman's contract with MSRPS. (Kalwarski, Tr. XI-133.)

57. On February 28, 1983 Milliman's written valuation report to MSRPS on judges' retirement plan was accompanied by a cover letter which opened, "At your request, we have made an actuarial valuation of The Pension Plan of Judges and Their Surviving Spouses of the State of Maryland as of June 30, 1982." (E. 779.)
58. The valuation report which accompanied the aforementioned cover letter assured MSRPS that Milliman's calculated contribution rate of 21.11% of payroll for judges was "necessary to liquidate the unfunded accrued liability of [\$]64,008,000 over 38 years from June 30, 1982 on a level percent of payroll basis." (Tab 16-1982, Rule 4 File; E. 778, 787.)
59. A note made by Moeller to another Milliman employee in 1982 with respect to evaluating the judges' pension plan and for which there is no evidence of any follow-up stated, "Why is the liability for them this year so much different from prior year? Do we care?" (Tab 85, Rule 4 File; Kalwarski, Tr. XI-137.)
60. Table 2 accompanying Milliman's initial February 28, 1983 valuation report for the judges' retirement plan showed a total of 141 retiree participants for whom 47 were correctly valued beneficiaries of deceased members then enjoying the 50% joint annuity residual, but 92 others were incorrectly valued as surviving retirees for whom benefit cost was calculated as if the normal form of payment was single life annuity rather than SLA plus joint and 50% survivor benefits. (Tab 16-1982, Rule 4 File, E. 786.)
61. Had Milliman correctly calculated the total liability of the judges and State police retirement and pension systems, it would have recommended to MSRPS additional contributions of about half a million dollars (\$500,000) in fiscal 1982, comprised of about \$200,000 for judges and another \$300,000 for police. (Custis, Tr. VII-5.)

62. Actuaries are professionally and contractually obligated to perform their work consistent with the applicable standards of care in force at the time and in the place where their work is done.
63. The chronological steps ordinarily employed by actuaries are to: (1) obtain necessary information from the client, (2) create valuation file summaries, (3) test methodology design, (4) perform a production run by computer using the intended data and methodology, (5) review the results, and finally, (6) present the results and recommendations to the client. (Tab 86, Rule 4 File; Custis, Tr. VI-38, VII-86, 102.)
64. Actuarial tools have advanced dramatically since 1982. (Custis, Tr. VI-34, VII-52; Moeller, Tr. VII-163; Gold, Tr. IX-156.)
65. In performing actuarial evaluations of retirement systems, the actuary must value two (2) separate and distinct sets of data in the course of the actuary's valuation methodology: (1) known factual data set forth in precise descriptive information obtained from a plan provider, such as numbers and ages of employees, amounts of salary, and nature of retirement benefits; and, in contrast to such definitively known data, (2) economic assumptions projected for the future, which in the case of Milliman's work for MSRPS, are certified to the actuary by the client and are understood by both parties to be inexact predictions rather than commodities whose precise values are known in the present. (Mowery, Tr. III-170; Moye, Tr. V-15; Custis, Tr. VII-21; Maloney, Tr. VIII-61; Nicholl, Tr. VIII-235, IX-18.)
66. In the exercise of reasonable professional care, the actuary should be and is reasonably expected to know and use in its valuation methodology the correct data for both the known factual information as well as the economic assumptions provided to the actuary. (Mowery, Tr. III-124; Custis, Tr.

- VII-84, 111; Nicholl, Tr. VIII-245, IX-6, 17; Gold, Tr. IX-150; Kalwarski, Tr. XI-96.)
67. In the performance of the contracts for actuarial services here at issue, MSRPS reasonably expected Milliman to know and use in its valuation methodology the correct data for both the known factual information as well as the economic assumptions provided to the actuary. (Krome, Tr. III-26.)
 68. Future economic projections are imprecise predictions upon which actuaries must rely but for which actuaries are not responsible when those projections turn out to be incorrect, unlike present factual data which is reasonably expected to be knowable and known by actuaries subject to the exception set forth in the immediately following Finding of Fact.
 69. The known factual data associated with retirement files for tens of thousands of individuals is reasonably expected to contain occasional errors which neither the actuary nor the client providing the data can be expected to discover and for which the actuary is not responsible. (Gold, Tr. IX-151; Kalwarski, Tr. XI-86.)
 70. A modification of calculation presumptions, either the known factual data or the projected economic assumptions used by the actuary, can effect the actuary's valuation conclusions for the purpose of setting a contribution rate.
 71. The retroactive occurrence and retrospective observation of an economic climate or investment strategy which inevitably gives rise to gains or losses different from those anticipated at a prior time does not alleviate an actuary's responsibility to use correct factual data when calculating contribution rates based on estimates of unknown future funding status of retirement and pension trust funds.
 72. Calculation of liability for retiree benefits is subject to very different actuarial computations than those for active employees because the current retiree benefit already being paid is or should be precisely known by the actuary, subject

only to extrapolation based on mortality projections; but by contrast, liability associated with active employees must be projected based on such more uncertain estimated quantities as number of future retirees, forms and amounts of payment, and dates, amounts, and duration of monies to be paid long in the future. (Mowery, Tr. IV-43; Custis, Tr. VI-44.)

73. Improper calculation of retiree benefits is "self-correcting" in the sense that when a retirement beneficiary expires, that retiree's benefits may terminate and he or she may be removed from data rolls or be modified to a new form of continuing residual payment. (Gold, Tr. IX-184.)
74. For the reason set forth in the foregoing Finding of Fact explaining the phenomenon of "self-correction" for retirees, an error in the actuarial methodology for valuing retiree benefits may result in a mistake quantified as less than that which might otherwise result from a similar error in the methodology for valuing liability for active employees.
75. In contrast to accounting valuations which are snapshots of the present, actuarial advice approximates future liabilities and is by nature therefore imperfect and as a result, the reason that annually revised recommendations are routinely sought by pension and retirement fund trustees is to provide continuing course correction in order to supplement or reduce contributions to retirement trust funds based in part on actual past performance as well as emerging economic forecasts and projections of future need. (Gold, Tr. IX-183.)
76. As actuarial customs and practices have evolved and become generally accepted standards of care, they have been reduced to writing and adopted by appropriately accredited professional associations as statements of duties and responsibilities required to be employed by actuaries in the course of rendering reasonable actuarial care and advice. (Mowery, Tr. III-82; Nicholl, Tr. IX-12.)

77. The actuarial Guides to Professional Conduct originally written in 1969 was replaced in 2005 by the actuarial Code of Professional Conduct and in addition to those learned treatises expressing accepted written statements of actuarial professional standards, since the late 1980's, the generally accepted professional standards of care for the actuarial profession have been established, written and promulgated by the Actuarial Standards Board (ASB), the successor professional organization to the American Academy of Actuaries. (Mowery, Tr. III-85; E. 663.)
78. In addition to the officially adopted and promulgated written standards of care for the actuarial profession, there are also generally accepted standards of practice for actuaries which are unwritten but nonetheless constitute professional standards of care which contribute to expert assessment of how the requisite standard of professional care must be exercised in particular actuarial settings. (Mowery, Tr. III-101.)
79. The following written expressions of standards of professional actuarial care in these Findings of Fact were applicable at all times relevant to the issues presented in this appeal even though they may not have been formally written and adopted until after the time at which breach of the written standard is here alleged to have occurred. (Mowery, Tr. III-88, 92, 97.)
80. The historic Guides to Professional Conduct adopted by the American Academy of Actuaries states: "The actuary will act for each client or employer with scrupulous attention to the trust and confidence that the relationship implies and...[t]he actuary will exercise his best judgment to ensure that any calculations or recommendations made by him or under his direction are based on sufficient and reliable data." (Tab 17-A, Rule 4 File; Page 445, §2(b), Appendix 1, Tab 18B, Rule 4 File.)

81. Actuarial Standard of Practice (ASOP) No. 4 pertaining to recommended practices for data analysis, developed by the Pension Committee of the Actuarial Standards Board, and adopted by the full Actuarial Standards Board in October 1993 provides, "5.2.2 - All provisions of the plan adopted and effective on or before the start of the plan year should be taken into account in measuring pension obligations." (Page 5, Tab 17-G, Rule 4 File; Mowery, Tr. III-92; E. 631.)
82. ASOP No. 4 further provides: "5.2.3(a) - The actuary will generally rely on the plan administrator, plan sponsor or other qualified third party for asset and participant information. While not responsible for auditing the information, the actuary should verify its reasonableness both directly and against other available information, such as prior years' data and reported benefit payments. If the actuary is not satisfied as to the reasonableness of the information, further inquiry should be made until the actuary is so satisfied." (Page 5, Tab 17-G, Rule 4 File; Mowery, Tr. III-95, IV-113; Nicholl, Tr. VIII-216, IX-15; E. 631.)
83. ASOP No. 23 pertaining to data quality was initially written in the mid 1990's, refined by the General Committee of the Actuarial Standards Board, and adopted by the full Actuarial Standards Board in December 2004 to apply to all actuarial practice areas, stating: "3.4 -- Reliance on Other Information Relevant to the Use of Data - In many situations, the actuary is provided with other information relevant to the appropriate use of data such as contract provisions, plan documents and reinsurance treaties. The validity and comprehensiveness [as contrasted to clarity] of such information are the responsibility of those who supply such information. The actuary may rely on such information supplied by another, unless it is or becomes apparent to the actuary during the time of the assignment that the

information contains material errors or is otherwise unreliable... [and] 3.5 - Review of Data - A review of data may not always reveal existing defects. Nevertheless, whether the actuary prepared the data or received the data from others, the actuary should review the data for reasonableness and consistency..." (Page 4, Tab 17-L, Rule 4 File; Custis, Tr. VII-47, 54; Gold, Tr. IX-152.)

84. In 1982 Milliman had no internal guidelines concerning the handling of data quality concerns. (Custis, Tr. VII-69.)
85. The central role of the actuary retained in the context of the needs of MSRPS by its contract with Milliman was to determine the value of assets and the cost of defined benefits and other liabilities in order to compute the amount of contributions required to be paid each year as the amortized employer contribution rates necessary to achieve and maintain solvency in the State's various retirement accounts. (Kopp, Tr. II-120; Krome, Tr. III-20; Custis, Tr. VI-17, 21.)
86. By the express terms of the actuarial services contract entered into and transmitted by MSRPS to Milliman on October 22, 1982 and thereafter renewed on February 7, 1986, Milliman was obligated to "[p]repare an annual actuarial valuation...for the following retirement plans and certify the employer retirement contribution rates to the Board of Trustees.
1. Teachers' Retirement System of the State of Maryland
 2. Pension System for Teachers of the State of Maryland
 3. Employees' Retirement System of the State of Maryland
 4. Pension System for Employees of the State of Maryland
 5. State Police Retirement System of the State of Maryland [and]
 6. Pensions for Judges and Their Surviving Spouses."
- (E. 507, 511.)
87. As required by SPP § 21-125(b)(1), in 1982 Milliman began making such separate and independent valuations of each of the State's retirement and pension systems, just as Buck had

- done before Milliman. (Tab Nos. 25-27, Rule 4 File; Custis, Tr. VII-72, 131; Kalwarski, Tr. XI-50, 147.)
88. Milliman continued to serve as actuarial consultant to MSRPS by additional contracts effective July 1, 1990 and July 1, 1993, both of which also required Milliman to perform individual and separate valuations of each MSRPS system, which Milliman did each year. (E. 513, 520.)
89. In response to a certain MSRPS Request for Proposals (RFP) dated March 27, 1998 and known as MSRPS Solicitation #98-09, Milliman submitted a proposal on May 1, 1998 which was approved by the Board of Public Works (BPW) on August 5, 1998 creating a fourth contract for actuarial services with a term through August 4, 2003, later extended to August 4, 2006 by which Milliman promised to continue to perform annual plan valuation services for each of the several systems within MSRPS which ultimately grew from six (6) systems in 1982 to ten (10) by 2005 to present. (E. 525.)
90. In addition to the annual valuation of each retirement system's assets and liabilities, at least once every five (5) years the actuarial consultant to the MSRPS Board of Trustees is required to make an actuarial investigation into the compensation, mortality and service experience of the participants of each of the several retirement systems within MSRPS. (SP&P §21-125(c).)
91. Milliman never conducted for MSRPS a rigorous study of beneficiary mortality. (Mowery, Tr. III-178.)
92. The primary records initially provided by MSRPS to Milliman consisted of two separate reel-to-reel magnetic computer tapes listing beneficiaries of the State retirement systems, one containing approximately 140,000 active employees and the other an additional 30,000 retirees. (Tabs 34, 36, Rule 4 File; Custis, Tr. VI-42, VII-89; Moeller, Tr. VII-169; Gold, Tr. IX-160; Kalwarski, Tr. XI-14.)

93. The tape of active members was separate from the tape of retirees and each tape had its own coding and separate written coding explanation recital. (Mowery, Tr. IV-35.)
94. All of the retiree data for all six (6) of the State retirement systems that existed in 1982 was set forth on the single retiree tape.
95. Subject to the exception noted above for the occasional errors which inevitably appear in large, constantly changing descriptive data files, and except for an error discovered and reported by MSRPS to Milliman in November and December 1990 for some 5,600 employees who worked only ten (10) months annually rather than twelve (12), the data set forth on the tapes provided to Milliman by MSRPS was accurate. (Tabs 126, 127, Rule 4 File.)
96. There were over 800 data positions on the retiree tape, which included positions 59-60, identified as "option," positions 235-237, identified as "normal option factor," and positions 435-438, identified as "beneficiary allowance at retirement." (Tab 36, Rule 4 File.)
97. As it began its data collection and analysis, Milliman was not sure where the form of payment was located on the MSRPS tape. (Custis, Tr. VI-52; Moeller, Tr. VII-172; Nicholl, Tr. VIII-211; Kalwarski, Tr. XI-17.)
98. It was reasonable and appropriate for Milliman to inquire of MSRPS into the meaning of the codes on the tapes and in particular, the location of the form of payment. (Custis, Tr. VI-53; Thomas DeLutis, Ph.D. (DeLutis), Tr. VIII-180, 184; Nicholl, Tr. VIII-212, IX-8; Gold, Tr. IX-161.)
99. The form of payment specifying retiree benefits appeared at positions 59-60 of the magnetic tape, identified in the file description as "option" and that code location was ultimately determined and correctly understood by Milliman. (Custis, Tr. VI-61; DeLutis, Tr. VIII-157.)

100. Retiree liability for only three (3) of the ten (10) retirement systems was understated by Milliman, or put another way, all employees for all but three (3) of the ten (10) systems were calculated correctly, and active employees for those three (3) affected systems were also properly valued. (Mowery, Tr. III-177.)
101. Of the approximately 170,000 persons represented on the two (2) tapes, Milliman properly calculated correct retirement benefits for all 140,000 of the active employees and all of the 30,000 retirees except for 480 individuals, or in other words, Milliman's calculations were correct for about 99.7% of the total number of individuals on the MSRPS tapes. (Appellant's Ex. No. 38.)
102. Milliman made no error in the amounts paid to retirees of the three (3) affected systems, only the form of benefit, which should have included benefits payable to surviving spouses of judges and police officers rather than single life annuities for those particular retirees.
103. The "normal" form of retirement benefit payment, also referred to as the "default" form of payment, was also identified by MSRPS in 1982 as the "maximum" benefit for the system in which the employee or retiree was enrolled, that designation identifying the retiree's automatic form of payment as compared to alternative "optional" forms of benefits, for which the retiree in some systems enjoyed the option of selecting and paying for some form of payment other than the normal form.
104. In 1982 MSRPS used retirement code "00" to designate "maximum" retirement benefits. (DeLutis, Tr. VIII-178.)
105. While coding of benefits by numerical or alphabetical designation is common, "maximum" as a designation of retirement benefits is not an ordinarily used term for actuarial purposes. (Moeller, Tr. VII-202; DeLutis, Tr. VIII-186.)

106. For MSRPS purposes in 1982, code "00" or "maximum" meant straight life annuity for the great majority of the participants of all of the retirement systems, but not for judges and police, whose maximum benefits also included 50% payments to surviving spouses.
107. Milliman incorrectly interpreted retirement code "00" for all retirement systems as a single life annuity without spousal benefits. (Custis, Tr. VI-64, VII-92, 98, 111.)
108. Code "00" was in fact a straight life annuity form of benefit payment for most MSRPS participants, but not for employees enrolled in the judges or police retirement systems, who also were provided a 50% surviving spousal benefit in addition to the single life annuity enjoyed by other retirees. (Custis, Tr. VI-65.)
109. At the hearing in this appeal, a competent, qualified, practicing actuarial professional offered expert testimony to support the legal conclusion that the foregoing incorrect interpretation of MSRPS codes constituted a breach of the applicable standard of professional care on the part of Milliman as the expert actuarial consultant retained by MSRPS for actuarial advice and support in 1982. (Mowery, Tr. III-130, 136.)
110. Milliman was provided by MSRPS with a booklet describing the benefits payable under the State police pension plan in which it was stated, "A member of the Maryland State Police Retirement System with a spouse as of the date of retirement must elect the maximum retirement allowance...At the retiree's death, one-half of the monthly retirement allowance will be paid to the surviving spouse for life." Tab 22, Rule 4 File; Kalwarski, Tr. XI-109.)
111. Among the written materials provided to Milliman to permit the actuary fully to understand the meaning of the numerical coding on the computer tape record were two documents, the

Annual Valuation Record for active employees which stated that the form of payment was coded as follows:

00 = MAXIMUM
01 = OPTION 1
02 = OPTION 2
03 = OPTION 3
04 = OPTION 4
05 = SPECIAL OPTION 4;

and the "Codes and Flags" memo associated with the magnetic tape for retirees, which identified the meaning of codes as follows:

0 - maximum
1 - single life (less than 4)
2 - joint life (smallest allowance - beneficiary allowance same as retiree)
3 - joint life (higher than 2 - beneficiary allowance $\frac{1}{2}$ retiree allow.)
4 - single life (lower than maximum)
5 - special (anything)

(Tab Nos. 33-42, Rule 4 File; Custis, Tr. VI-67;
E. 750-777.)

112. Because the nature of the retirement benefit identified by code "00" varied depending on the particular retirement system in which the participant was enrolled, "00" on the retirement coding tape meant a straight life annuity for teachers, for example, but for judges and State Police "00" meant a straight life annuity plus a 50% benefit for surviving spouses as the maximum or normal form of payment.
113. In its evaluation methodology Milliman failed to recognize that the code "00" for retired judges and State police included a 50% benefit for surviving spouses in addition to a straight life annuity.
114. In the course of Milliman's calculations from 1982 until 2004, Milliman regarded the code "00" as meaning only a straight life annuity for all of the State's retirement systems even though Milliman should have known that the code "00" actually was not just a straight life annuity for judges and State police but also included a continuing 50%

benefit for surviving spouses of participants enrolled in those two (2) particular retirement systems.

115. Some of the beneficiaries coded as "00" on the MSRPS retiree data files were indeed single life annuitants, namely, surviving spouses of deceased retirees then receiving the 50% survivor benefit as the remaining single life annuitant, but Milliman misinterpreted the coding for the great majority of the beneficiaries coded "00," namely, those who were living retirees with living spouses, for whom Milliman incorrectly valued the liability due these persons on the retiree tapes of the affected retirement systems as if they were only single life annuities rather than single life annuities plus a joint and 50% survivor benefit, which should have been calculated at a slightly higher amount of liability. (Mowery, Tr. IV-82; Custis, Tr. VI-75.)
116. In 2004 MSRPS prepared a new explanation of the various codes set forth in its computerized pension and retirement data files, in which code "00" was no longer referred to as "maximum," but instead, as "basic allowance." (Tab 200, Rule 4 File; Mowery, Tr. IV-62; DeLutis, Tr. VIII-196.)
117. In 1982 in addition to the original Annual Valuation Record and the Codes and Flags memoranda provided to Milliman by MSRPS to explain the meaning of the codes set forth in its computerized pension and retirement data files, Milliman had at its disposal a variety of additional sources describing the retirement benefits enjoyed by Maryland State employees, including the benefit handbook for the State Police, which gave a detailed explanation of State Police retirement benefits, stating, "maximum allowance means that the retiree shall receive in retirement while living the largest monthly retirement allowance over any of the four optional retirement allowances. At the retiree's death, one-half of the monthly retirement allowance will be paid to the

- surviving spouse for life." (Tab 22, Rule 4 File; Kalwarski, Tr. XI-115; E. 686.)
118. When Milliman reviewed Maryland statutes in order to plan its valuation methodology Milliman was again informed of the default and optional benefits associated with each of the State's retirement systems, including that the judges' plan had no options because it automatically included a 50% surviving spouse benefit and State Police retirement benefits also included the same benefit payable to surviving spouses, allowing only unmarried participants to forego the maximum benefit and choose instead an option. (Art. 88B § 53, Maryland Annotated Code, 1982; E. 727.)
119. Milliman had to know MSRPS members' maximum retirement benefits in order to calculate Special Option 4 allowances, which Milliman did in 1982. (Tab 62, Rule 4 File; E. 861.)
120. In 1982 MSRPS's lead representative in communications with Milliman concerning the meaning of the codes on the retirement tapes was MSRPS employee John King (King), who served at that time as MSRPS's Director of Systems Development.
121. Representatives of Milliman, including Custis and Moeller, routinely spoke by phone with King concerning the meaning of the codes on the magnetic tape. (Tabs 51, 59, 60, Rule 4 File; Custis, Tr. VI-53, VII-47, 94, 122, 127; Moeller, Tr. VII-173; Kalwarski, Tr. XI-21.)
122. Milliman's primary focus in the initial development of its evaluation methodology was with the largest of the MSRPS constituent systems, namely, the teachers' retirement fund, because it presented a \$600 million discrepancy between the 1982 and 1981 pension liability calculations as compared to much smaller discrepancies for the other retirement plans. (Tab 59, Rule 4 File; Custis, Tr. VII-134.)
123. Shortly after Moeller spoke to Kalwarski about the teachers' retirement fund, Moeller telephoned King with questions

about the meaning of the codes on the MSRPS retirement tapes and memorialized that conversation with a cryptic handwritten note the last line of which stated specifically: "code 0 = SLA [single life annuity]." (Tab 60, Rule 4 File; Moeller, Tr. VII-189; E. 859.)

124. Not surprisingly, at the present time neither Moeller nor King recall the telephone discussion that occurred over 25 years ago from which Moeller was left with the documented impression that "00" meant single life annuity, though King knew the forms of payment for the retirement systems at the time that he answered Moeller's questions about the meaning of the codes on the retirement tape. (Moeller, Tr. VII-187.)
125. Prior to discovery of its coding error in 2004, Milliman never communicated in writing from or to MSRPS concerning Milliman's impression that "00" mean single life annuity for judges and police. (Moeller, Tr. VII-196.)
126. For the teachers' retirement fund, Code "00" did mean single life annuity because that was the basic allowance for retired teachers, but Code "00" did not mean single life annuity for all of the retirement systems because the basic allowance varied between retirement systems, most of which afforded only a single life annuity, unlike those for judges and police, which also included a survivor benefit.
127. Moeller's note also reflects that she incorrectly notified Don Rogers, an employee of M&R, Milliman's data processing agent in Seattle, that Code "00" meant single life annuity, thereby incorporating the coding error into Milliman's valuation program. (Tab 60, Rule 4 File.)
128. Although Milliman correctly understood the benefits payable and actually paid to Maryland retirees, when it developed its methodology to calculate future liabilities, Milliman did not correctly understand the meaning of the codes on the

- retiree tape indicating retirees' normal form of payment for judges or State police.
129. The initial incorrect methodology developed by Milliman in 1982 was replicated annually until the error was discovered in 2004. (Kalwarski, Tr. XI-93.)
 130. For twenty-two (22) years Milliman failed to recognize the applicable plan provisions for police and judges in its methodology correctly to calculate the proper amount of required employer contributions to fund those systems.
 131. In 1982 Milliman failed properly to review its methodology and results for calculating employer contributions toward the affected retirement and pension systems and failed to follow-up on information then detected that indicated the existence of an error in Milliman's calculation methods.
 132. At the time of its initial data interpretation process and continuing until the discovery of the error more than twenty (20) years later, Milliman believed that code "03" would be inserted in position 59-60 of the magnetic tape if a survivor benefit existed for state police and judges, but in fact, Milliman's interpretation in this regard was incorrect because the code "03" appeared at this position only if the retiree was unmarried. (Custis, Tr. VII-105; Gold, Tr. IX-165.)
 133. If "03" had meant joint and survivor benefits for police as Milliman believed, over 90% of State police at the inception of Milliman's work on the Maryland contract should have been coded "03" but in fact, the vast majority of State Police were coded "00." (Custis, Tr. VII-118.)
 134. Milliman should have promptly recognized its erroneous understanding of codes "00" and "03" for retired State police because if "03" had meant joint and survivor benefits as Milliman believed, over 90% of State police at the inception of Milliman's work on the Maryland contract should

- have been coded "03" but in fact, the vast majority of State police were coded "00."
135. Similarly, if "03" had meant joint and survivor benefits for judges as Milliman believed, all State judges at the inception of Milliman's work on the Maryland contract should have been coded "03" but in fact, most were coded "00." (Custis, Tr. VII-114.)
136. Milliman should have promptly recognized its erroneous understanding of codes "00" and "03" for judges because if "03" had meant joint and survivor benefits as Milliman believed, all State judges at the inception of Milliman's work on the Maryland contract should have been coded "03" but in fact, most were coded "00."
137. In 1982 Bruce Klug (Klug) was an actuarial student working for Milliman on the Maryland contract out of its Milwaukee office. (Tab 92, Rule 4 File; Custis, Tr. VII-77.)
138. On or about November 10, 1982, after reviewing Moeller's benefit formulas, Klug interlineated onto Moeller's handwritten worksheet the following note: "Payable as a J + $\frac{1}{2}$ S benefit". (Tabs 69, 70, 72, Rule 4 File; Moeller, Tr. VIII-8; E. 877.)
139. Klug also prepared a hand-written document dated 11/10 [1982] which he titled, "Changes to Valuation Formula" and therein noted under the heading, "Judges," the following: "Death Benefit split into 2 decrements (50% married per phone call from Tom Cavanaugh - Buck)" and "both = 50% total deaths" and under the heading "State Police," Klug noted "Normal Form is J + $\frac{1}{2}$ S." (E. 878.)
140. Klug's notes appear to have been intended to alert others at Milliman of the correct forms of payment for Maryland judges and police prior to Milliman's valuation calculations.
141. Despite Klug's notes, there is no indication that the change from single life annuity to benefits including joint and one-half survivor for the judges or police retirement

systems was relayed to Milliman's data processing affiliate in Seattle.

142. The applicable standard of actuarial professional care required Milliman to compare its calculations in 1982 against Buck's calculations the prior year. (Page 5, Tab 17-G, Rule 4 File.; Mowery, Tr. III-105, 142, 146; Nicholl, Tr. IX-11; Gold, Tr. IX-170.)
143. Milliman did compare its 1982 calculations to those of Buck from the preceding year. (Respondent's Ex. No. 14; Tabs 24-27, 79, 89, Rule 4 File; Custis, Tr. VI-79; Nicholl, Tr. VIII-221; Kalwarski, Tr. XI-35.)
144. Klug analyzed Milliman's preliminary 1982 calculations and compared them to Buck's 1981 calculations, noting that although the number of State police retirees increased from 288 to 339 or 341, their total retirement liability decreased from \$67 million to \$65 million (Respondent's Ex. No. 13; E. 387; Tab 79, Rule 4 File; Custis, Tr. VII-129, 138; Kalwarski, Tr. XI-114.)
145. The foregoing finding should have alerted Milliman to the potential existence of an error, though without further examination, it was unknown at that time whether any computation error might have been attributable to Milliman's calculations or Buck's.
146. A prudent actuary noting the aforesaid discrepancy may have deemed it appropriate to investigate further. (Gold, Tr. IX-176; Kalwarski, Tr. XI-114.)
147. In addition, Klug calculated 15.897 as the average annuity factor for Buck's 1981 valuation of the police retirement system, comparing that number to Milliman's 1982 valuation of 11.817 as its average annuity factor (which Milliman later adjusted to 12.46 based on cost of living adjustments and decades later Mowery corrected to 13.83, but the point here is that in 1982 Klug initially noted an even greater discrepancy from actuarial expectations but no one followed

- up); and Klug calculated 10.852 as the judges' average annuity factor computed by Buck in 1981, compared to an average annuity factor of 8.399 computed by Milliman in 1982; discrepancies which were unexpected and surprising, but which remained unexplained and unexplored as the actuarial advice afforded MSRPS transitioned in 1982 from Buck to Milliman. (Tab 79, Rule 4 File; Mowery, Tr. III-148, 154, 157; Custis, Tr. VI-91, VII-140; Nicholl, Tr. VIII-222; Gold, Tr. IX-180; Kalwarski, Tr. XI-27; E. 883-884.)
148. The aforesaid comparisons of average annuity factors were appropriate pursuant to ASOP No. 4, which directs the actuary to make further inquiry when the prior year's data does not match the current year's.
149. A hand-written worksheet note written by Klug on or about November 16, 1982 and transmitted to M&R in Seattle stated, "Enclosed is a copy for the State Police. Benefit Definitions - Last page (Death Benefits is Changed). There was also a Post Retirement Death Benefit that we overlooked. Basically the benefits are the widow or widower benefits under 5.c.Sec. (Pg. 17. [sic] of Buck's benefit description." (E. 880.)
150. By correspondence dated November 30, 1982, Milliman reported its first actuarial valuations to MSRPS as of June 30, 1982 noting increases in liabilities and requisite contribution rates for most MSRPS systems. (Respondent's Ex. No. 12; Tab 89, 90, Rule 4 File; E. 895.)
151. Milliman's initial calculation of total MSRPS liabilities as of June 30, 1981 was about \$7.3 billion, compared to Buck's calculation of \$5.4 billion the year prior. (Pages 1, 2, Tab 236, Rule 4 File.)
152. Accounting for the dramatic increase in Milliman's calculations as compared to Buck's were increases of about 30% or \$600 million in liability valuation for the teachers' retirement and pension plan, from Buck's \$2.7 billion in

- liabilities to Milliman's valuation of \$3.47 billion, and an increase of about 20% or nearly \$200 million in liability valuation for the state employees' plan. (Tab 236, Rule 4 File; Kalwarski, Tr. XI-31.)
153. As a result of Milliman's increased calculation of MSRPS total liabilities to about \$8.1 billion in 1982 compared Buck's calculation of total liabilities of \$7.3 billion the prior fiscal year, Milliman recommended to MSRPS dramatically higher rates of contribution to the retirement systems than those recommended by Buck, MSRPS anticipating the necessity of contributing \$329 million in FY-'83 based on Buck's recommendations, which were revised upward by \$132 million that year to \$432 million based on Milliman's calculations, representing a one-year increase of over 30%, higher than any increase that occurred over the course of the next twenty (20) years. (Tab 94, Rule 4 File; Kalwarski, Tr. XI-33, 43.)
154. According to the Minutes of the MSRPS Board of Trustees, the deficient liability calculated by Buck as compared to Milliman was explained on February 1, 1982 by an actuary for Buck to be the result of Buck's use of simple interest rather than compound interest in valuing post-retirement payment obligations. (Tab 19-6, Rule 4 File; Custis, Tr. VI-100.)
155. Representatives of the State and its employees, including the Director of the Department of Fiscal Services, were greatly concerned about the dramatic one-year increase in contribution rates to MSRPS pension and retirement funds arising from Milliman's initial calculations and notified Milliman that they sought stability and predictability. (Kalwarski, Tr. XI-41.)
156. Milliman transmitted to MSRPS its 1982 valuation report for the State police retirement fund on February 28, 1983, including a transmittal letter signed by Kalwarski which

assured MSRPS of the sufficiency of the data provided by MSRPS to Milliman, stating specifically: "the data furnished to us are, in our opinion, sufficient and reliable for the purposes of our calculations." (Page 3, Tab 42, Rule 4 File; Custis, Tr. VII-151; E. 804, 806.)

157. In response to the discovery of the coding error and in defense to the instant claim, Milliman now contends that the codes used on MSRPS's data tape were unusual, confusing, and not in compliance with industry standards, and furthermore, that the meaning of the codes on the MSRPS tapes was misrepresented in statements made by agents of MSRPS.
158. In September 1983 during the course of Milliman's second valuation of Maryland's retirement systems, which was the first valuation for which Milliman's annual computations could be compared with one another rather than against calculations made by another actuary, Klug wrote that "[d]etermining which fields to add and how to handle Δ [different] options was handled by Gene [Kalwarski] in D.C. per a phone call to Maryland personnel. Confirm procedure & check it out." (E. 908.)
159. With respect to the aforesaid second apparent attempt by Klug to assure that Milliman was accurately evaluating judges and police retirement benefits to include a joint and 50% survivor benefit, again there is no evidence to suggest that anyone else at Milliman acted in response to Klug's notes and recommendations.
160. Another opportunity for Milliman to discover its coding error in the methodology it used to calculate future retirement liability for State judges and police arose when Milliman performed its first valuation for DNR police, a system established July 1, 1990, but instead, Milliman merely duplicated its earlier coding error incorporated by the methodology it used to evaluate the two (2) pre-existing retirement systems affording joint and 50% survivor

- benefits. (Mowery, Tr. III-161; Nicholl, Tr. IX-57; Kalwarski, Tr. XI-65.)
161. As evidenced by Milliman's Summary of Plan Provisions set forth as Appendix D-27 attached to its December 4, 1991 report to MSRPS, Milliman correctly understood that "normal form is a 50% joint and survivor annuity with spouse" but did not recognize that other optional forms of payment could only be selected if the member had no spouse. (Tab 16-1992, Rule 4 File; E. 983.)
162. In 1991 Milliman was specifically informed by MSRPS that "DNR allows all of the optional forms of payment found in ERS [State employees retirement system] or EPS [State employees pension system] only if the member has no spouse at retirement" and "Normal form is 50% joint and survivor annuity with spouse, if any, or if there's no spouse could be the other options." (Tabs 16-1991 and 130, Rule 4 File; Kalwarski, Tr. XI-152; E. 991.)
163. On May 16, 1991 Milliman confirmed its correct understanding of benefits payable to DNR police when it wrote to MSRPS, "Even though DNR's normal form of benefit is a 50% joint and survivor annuity, (similar to the State Police plan), DNR allows all the optional forms of payment found in ERS [State employee retirement system] or EPS [State employee pension system]." (Pages 2, 9, Tab 129, Rule 4 File; E. 976.)
164. On July 15, 1991, MSRPS sent correspondence to Milliman clarifying that "DNR allows all the optional forms of payment found in ERS or EPS only if the member has no spouse at retirement." (Tab 130, Rule 4 File.)
165. Formerly consisting only of DNR police employees, in 1991 the newly created Law Enforcement Officers' System (LEOPS) had only 230 active employees and an additional 20 retirees. (Tab 16-1991, Rule 4 File; Kalwarski, Tr. XI-62; E. 365.)
166. An additional opportunity for Milliman to discover its coding error was presented in 1993 when Milliman was asked

to evaluate the cost of legislative changes to the judges' retirement system to permit retirees for the first time conditionally to select optional benefits, but Milliman still did not discover its mistaken interpretation of the meaning of Code 3 in the data associated with the judges' retirement system. (Tab 137, Rule 4 File; Kalwarski, Tr. XI-155; E. 1021.)

167. As a part of its May 1, 1998 technical proposal to continue to provide actuarial services to Maryland, Milliman stated: "At the time when M&R [Milliman] was first retained, the State incurred several economic costs due to erroneous actuarial calculations and communications from the prior actuary. During our tenure we believe our cost estimates have been exceptionally good...It has been noted in several national publications that actuarial errors have occurred elsewhere (e.g., Los Angeles) which in the end do cost the taxpayers money." (Page B-48, Tab 4-B, Rule 4 File; Maloney, Tr. VIII-95.)
168. Reasonable inquiry of MSRPS on the part of Milliman would have revealed and did reveal the true and correct form of benefits for all MSRPS participants, including benefits payable to surviving spouses of judges and police officers.
169. At all times relevant to the instant claim Milliman should have known that beneficiaries of the State's judges and police retirement systems enjoyed a surviving spousal benefit.
170. Despite MSRPS argument to the contrary, Milliman did know that beneficiaries of the State's judges and police retirement systems enjoyed a surviving spousal benefit. (Krome, Tr. III-19, 22, 46; Custis, Tr. VI-46, 69, VII-50; Moeller, Tr. VII-167; Kalwarski, Tr. XI-113.)
171. Although Milliman understood the normal form of payment for all Maryland retirees, the methodology encoded in the course of its data extraction processing incorrectly calculated the

- liability of the judges and police retirement and pension funds as if the retirees in those systems did not have a joint and 50% survivor benefit.
172. Liability cost of joint and 50% survivor benefits is greater than for a single life annuity alone without joint and 50% survivor benefits.
 173. Milliman discovered in 2004 that it made a coding error in its methodology for evaluating the Maryland State police retirement system initiated 22 years earlier. (E. 1051.)
 174. As a result of Milliman's discovery in September 2004 of the coding error for the Maryland State police due to the replication audit conducted by Milliman's Philadelphia office, Milliman reviewed its methodology on other of Maryland's retirement systems and learned that the same error was made for LEOPS, judges and legislators, which, like the State police, had been evaluated on the assumption of recipients' entitlement only to straight life annuity rather than the more costly benefits associated with dual lifetime benefits.
 175. Milliman admits that it made a coding error in 1982 on a small fraction of the named beneficiaries and that that coding error was subsequently replicated each year until October 17, 2004, when the error was discovered and promptly reported to MSRPS.
 176. As a result of the aforementioned coding error, the MSRPS police and judges retirement and pension plans were underfunded from 1982 until 2004.
 177. The coding error was discovered by Milliman during a replication audit conducted by Milliman's Philadelphia office in 2004. (Mowery, Tr. III-179; Custis, Tr. VII-28.)
 178. Milliman's 2004 replication audit was performed to implement certain new corporate policy recommendations from Milliman's Employee Benefit Review Oversight Panel (EBROP) in order to reduce exposure to potential actuarial malpractice claims.

(Tab 158, Rule 4 File; Custis, Tr. VII-33; Moeller, Tr. VIII-18; E. 1023-1048.)

179. The replication audit conducted by Milliman's Philadelphia office in 2004 was based upon the same sets of data and information that MSRPS annually provided each year to Milliman since Milliman's first valuation work in 1982.
180. Internal communications between Milliman's Philadelphia and D.C. offices include an e-mail transmission dated September 27, 2004 identifying the coding error in Milliman's calculation of the liability of the State Police retirement system by stating: "the deferred vested, inactive and retiree data files are all coded with single life annuities even though the normal form is a J&S." (Tab 172, Rule 4 File.)
181. Although the same coding error was made by Milliman in its evaluation of the legislative pension plan as for judges and police, MSRPS is not pursuing any claim for damages sustained by the pension plan for State legislators because the funding associated with that smaller plan was valued as a part of the valuation of the larger Employee's Retirement System, so the data necessary to calculate losses to the legislative pension plan is merged with and cannot be segregated from other State employees precisely to quantify an *ad damnum*.
182. Each year from 1982 until discovery of the coding error in 2004, the contribution rates certified by Milliman to MSRPS were not set in compliance with Maryland's statutory requirements for funding the retirement systems enjoyed by judges and State police.
183. During Milliman's annual valuation presentation to MSRPS on October 19, 2004, Milliman orally reported its discovery of the additional liabilities associated with the survivor benefits enjoyed by judges, State police, and local and special law enforcement officers which had not been

accounted for by its valuations of the previous 22 years.
(Krome, Tr. III-28; E. 681, 1059.)

184. In response to Milliman's notice to MSRPS of the error, MSRPS declined to certify the contribution rates recommended by Milliman on October 19, 2004 and instead posed a number of questions to the actuary and scheduled a follow-up meeting to receive additional requested information from Milliman.
185. At the follow-up meeting on October 27, 2004, Milliman presented written responses to MSRPS questions from the previous meeting, indicating that liabilities for the three (3) affected systems had been understated by the amount of \$131.7 million and recommending that the annual contributions into those systems be increased by \$7.7 million in the following fiscal year. (Respondent's Ex. No. 6; Tab 194, Rule 4 File; E. 1072.)
186. When the coding error was finally detected, MSRPS discovered that the three (3) affected retirement systems were not on track to achieve full funding as statutorily scheduled, but instead, the state police retirement system was funded at a level of 84% of liability, judges at 74%, and local law enforcement at 60%, as a result of which the principle of inter-generational equity was violated and increased future contributions to the retirement systems became necessary to restore full funding by amortizing the newly discovered deficiencies, increasing the amount of contributions needed to be paid in the future into those three (3) retirement systems for judges and police. (Moye, Tr. V-42.)
187. To assist MSRPS in its consideration of what course of action to follow in response to the discovery of the coding error, and upon the advice of its legal advisor, the Office of the Attorney General, MSRPS retained the Hay Group, a global human resource management consulting firm, to examine Milliman's work, render expert actuarial conclusions about

- it, and otherwise provide advice to MSRPS concerning the longstanding actuarial error. (Kopp, Tr. II-132, 146; Mowery, Tr. III-64; Moye, Tr. V-59.)
188. Mowery issued a report on behalf of the Hay Group dated October 31, 2005 describing shortfalls in Milliman's work and consequent losses to MSRPS. (Respondent's Ex. No. 7, Tab 210, Rule 4 File; E. 1092.)
189. Milliman was invited by MSRPS to participate in their investigation by responding to a detailed explanation of the MSRPS claim and subsequent requests for follow-up information as set forth in correspondence dated February 9, April 6, and June 16, 2006. (Tabs 7, 9, 11, Rule 4 File.)
190. Milliman responded to MSRPS requests for information and presented its defenses to the MSRPS claim. (Tabs 8, 10, 12, 13, Rule 4 File, E. 557.)
191. As set forth by counsel for Milliman in correspondence received by MSRPS on May 11, 2006, part of Milliman's defense was the allegation that "Milliman's files indicate that an Agency representative [MSRPS Retirement Administrator], Larry Bach, informed Mr. Custis that the 00 code meant a single life annuity and failed to clarify that the code had a duplicate meaning for the smaller systems. The notes state: "Per Larry Bach to Tom Custis 10.4.82 Normal form - SLA [single life annuity]." [Appearing at Tab 63 of the Rule 4 File.] Further, Milliman's Don Rogers appears to have received the same information from the Agency's John King." (Page 7, Tab 10, Rule 4 File.)
192. The Hay Group determined and advised MSRPS with respect to prospective liability concerning the coding error that had occurred between 1982 and 2003 that "Milliman's errors did result from their failure to apply reasonable standards of care as would have been expected of an actuary at that time." (Mowery, Tr. III-69; Moye, Tr. V-60.)

193. MSRPS approved the filing of a liability claim against Milliman by formal authorization of its Board of Trustees. (Krome, Tr. III-39; Mowery, Tr. III-72.)
194. Milliman claims that its incorrect interpretation of MSRPS codes was caused by communications Milliman received from MSRPS in 1982.
195. On February 14, 2008 the Procurement Officer issued a final decision finding that Milliman breached its contracts with MSRPS, asserting that Milliman's mistakes were significant and should have been detected, and concluding that as a proximate consequence of the breach, Milliman was liable to MSRPS in the amount of \$72,965,148 in compensatory damages. (Respondent's Exhibit 8; Tab 5, Rule 4 File; Mowery, Tr. III-76, E. 539.)
196. On March 13, 2008, Milliman noted the instant appeal before the Maryland State Board of Contract Appeals (Board), for which evidentiary hearing was conducted beginning May 12, 2009 and concluding May 28, 2009, with final briefs due and filed by August 28, 2009.
197. A qualified actuarial expert, Brent M. Mowery, FSA (Mowery) of the Hay Group, Inc., authored an expert report to MSRPS dated August 1, 2008 in which he opined: "Based upon the extensive investigation I (and my team) have completed, I have concluded that Milliman committed significant calculation errors in performing its actuarial work for the Several Systems [of MSRPS]. These errors resulted in Milliman's understatement of the amounts of annual employer contributions required for the affected systems over the 22-year period from July 1, 1983 through June 30, 2005. As a consequence of Milliman's commission of these calculation errors, and its failure to detect and correct those errors, for a period of 22 years, contributions that should have been made to fund the affected systems were not made, and investment earnings on those contributions that should have

been earned were not earned. Thus, I have concluded, the affected systems have suffered a significant financial loss. It is my actuarial expert opinion that the calculation errors committed by Milliman and the resulting financial loss to the affected systems could have, and should have, been avoided...[and] that the Milliman actuaries, in performing the duties required of the consulting actuaries for the affected systems (in particular, in performing the annual actuarial valuations), failed to comply with the standards of practice applicable to U.S.-based actuaries." (Respondent's Ex. No. 9; Page 5, Tab 18A, Rule 4 File; E. 634.)

198. Mowery specifically identified Milliman's breach of applicable professional standards of actuarial practice as: "Failure to identify, and factor into its determination of the liabilities and required contribution, that the normal form of payment applicable to the retirees for each of three affected systems was a 50 percent joint and survivor annuity, not a straight life annuity; Failure to discover that, as a result of the normal form error, the results of its initial valuations of the affected systems were unreasonable relative to the results of the last actuarial valuations of the affected systems performed by the predecessor actuarial firm, and Failure to deduct, for a period of 22 years, that these calculations errors existed, despite many opportunities to identify the problem, including annual reconciliations of the retiree census data in connection with the ongoing actuarial valuations of the affected systems." (Page 5, Tab 18A, Rule 4 file; E. 640.)
199. In a Supplemental Report dated March 25, 2009, Mowery also concluded that Milliman violated the official actuarial Guides to Professional Conduct with specific reference to "Section 4b: The actuary did not exercise his best judgment to ensure that any calculations or recommendations made by

him were based on sufficient and reliable data...[and] Section 2B: The actuary did not act for each client or employer with scrupulous attention to the trust and confidence that the relationship implies..." (Respondent's Ex. No. 10; Page 4, Tab 18B, Rule 4 File; Mowery, Tr. III-87; E. 660.)

200. When Mowery reviewed Milliman's work for MSRPS, he knew in advance the specific nature of the putative error he was to examine which at that time constituted a comparatively minute anomaly of about \$2 million out of a total liability of around \$8 billion. (Mowery, Tr. IV-30; Custis, Tr. VI-97.)
201. Precept 13 of the Code of Professional Conduct adopted by the American Academy of Actuaries applicable to its members effective January 1, 2001 provides: "An Actuary with knowledge of an apparent, unresolved, material violation of the Code by another Actuary should consider discussing the situation with the other Actuary and attempt to resolve the apparent violation. If such discussion is not attempted or is not successful, the Actuary shall disclose such violation to the appropriate counseling and discipline body of the profession, except where the disclosure would be contrary to Law or would divulge Confidential Information" and further provides in "Annotation 13-2. An Actuary is not expected to discuss an apparent, unresolved material violation of the Code with the other Actuary if either Actuary is prohibited by Law from doing so or is acting in an adversarial environment involving the other Actuary." (Page 128, Tab 17-K, Rule 4 File; Mowery, Tr. IV-11.)
202. In the course of Mowery's analysis and notwithstanding Precept No. 13 as set forth above, Mowery did not make inquiry of either Milliman or King concerning the source of or explanation for the alleged Milliman error. (Mowery, Tr. IV-7, 48.)

203. Mowery was not obliged to share his investigation or findings directly with Milliman pursuant to Precept No. 13 because Mowery was acting in an adversarial environment involving the other Actuary for which right of inquiry and discovery from Mowery was provided to counsel for Milliman.
204. The Honorable Timothy F. Maloney, Esq. (Maloney), a former member of the Maryland General Assembly and recognized expert on the State budget process, authored a report accurately outlining the history thereof since 1970 with respect to MSRPS funding and opined, "Fluctuation in unfunded accrued liability does not result in losses to the State. To the extent that the State's contribution rate decreases or is lower than actuarially required, the State continues to have the use of those funds in the general fund for such public purposes as are legislatively determined...In short, the State is not damaged by the identification of an unfunded liability. By statute, these liabilities are obligations of the State, both before and after the identification...The State has not lost money as a result of the identification of the unfunded liabilities." (Pages 8, 9, Tab 18F, Rule 4 File; E. 667.)
205. In a responsive written report, Maryland State Treasurer Nancy Kopp (Kopp) refuted the foregoing contentions by Maloney. (Respondent's Ex. No. 4; Tab 18C, Rule 4 File; E. 665.)
206. Qualified actuarial expert Jeremy Gold, F.S.A. (Gold) reviewed Milliman's 1982 work for MSRPS and concluded that it was "as good as anything I've seen," authoring a report dated October 15, 2008 in which he differed dramatically with Mowery's expert opinions, stating "Milliman met all applicable actuarial standards of care. My review of the work performed by Milliman in the 1982 valuation reveals a meticulous effort to get everything right...Mowery applies a standard of care that does not exist. His standard of care

amounts to a standard of perfection." (Pages 3, 4, Tab 18H, Rule 4 File; Gold, Tr. IX-159.)

207. Qualified actuarial expert Kim Nicholl, F.S.A. (Nicholl) of PricewaterhouseCoopers also reviewed the pertinent files and testified that Milliman "did meet all the applicable standards of care in 1982" and authored a report dated October 15, 2008 in which she notes, "the definition of Retiree Option Code was something that Milliman needed and that the State had. It is clear that there was a miscommunication between the State and Milliman of the definition of Retiree Option Code 00. This miscommunication may have been caused by the State. At a minimum, it is evident that there was no clear explanation of what the Retiree Option Code meant and as a result Milliman should not be criticized for the misinterpretation of this code", Nicholl concluding also that "the amortization payments for the \$72,965,148 [in damages calculated by Mowery] of additional contributions, plus interest, is small when compared to the contributions to the State Police, Judges and LEOPS plans and immaterial when compared to the total contributions." (Nicholl, Tr. VIII-204, IX-13; Pages 17, 40, Tab 18I, Rule 4 File; E. 671.)
208. Qualified information systems expert Thomas G. DeLutis, Ph.D. (DeLutis), President of ENX Group, Inc., authored a report dated October 15, 2008 in which he reviews the responsibility of a data owner to develop a succinct and unambiguous "data dictionary" to inform other users of the correct meaning of the information contained in a data record, concluding that "[M]SRPS did not adequately document the meaning or semantics for the Retirement Option Code value "00" and phrase "00 = Maximum" in 1982...[and] failed to meet [the] appropriate standard of care when it did not adequately document the semantics for the Retirement Option Code data field values in 1982", though his specific trial

testimony was not couched for the purpose of establishing a violation of any professional standard of care but instead, an inconsistency with industry standards and a failure on the part of MSRPS to exercise reasonable care in documenting and communicating the meaning of the "00" code in MSRPS data records on retirees. (Appellant's Ex. Nos. 7-16; Pages 13-14, Tab 18K, Rule 4 File; DeLutis, Tr. VIII-129, 139, 166, 168.)

209. Johns Hopkins University Professor Emeritus of applied economics and qualified expert in the fields of applied economics and the financial aspects of environmental issues, John J. Boland, Ph.D. (Boland), authored an initial report dated October 15, 2008, a Supplemental Report dated March 2, 2009 and an Addendum thereto dated April 23, 2009 in which he posits that economic theory suggests no difference in the returns gained by long-term and short-term investments and limits the hypothetical economic damage accruing to MSRPS by Milliman's coding error on the basis of a .33% risk of default, reducing the total value of unpaid contributions to \$2,290,718, in his Supplemental Report stating not only that "there should be no long-term advantage to investing contributions in the pension funds as opposed to the General Fund investment pool" but also that "funds deposited in each of the last 13 years would have produced larger earnings to date in the General Fund investment pool than in the pension funds." (Appellant's Ex. No. 29; Respondent's Ex. No. 24; Tab 18L, Rule 4 File; Pages 2, 3, Tab 18M, Rule 4 File; Tab 18N, Rule 4 File; Moye, Tr. IX-114; E. 676.)
210. Milliman claims that MSRPS sustained no damages as a result of its coding error. (Maloney, Tr. VIII-66, 90; Gold, Tr. IX-189, 194; Boland, Tr. X-55, 65; Kalwarski, Tr. XI-95.)
211. Milliman claims that the employer contribution rates it recommended to the MSRPS Board of Trustees were not set too low, but instead, that the overall results established by

- Milliman for MSRPS were actuarially sound, falling within a "range of reasonableness." (Custis, Tr. VII-60; Nicholl, Tr. VIII-218, 232, IX-24, 32, 64, 78; Gold, Tr. IX-188.)
212. In October 2004 an internal e-mail at Milliman stated, "Technically, the contributions required to fund these benefits will be higher because they'll be paid later, and hence will be increased to reflect the time-value of money. I doubt that the Board [of Trustees of MSRPS] will think of a higher contribution later as being the same as a lower earlier contribution just because both figures are equivalent when adjusted for interest." (E. 388.)
213. The total accrued liability due to Milliman's repeated coding error beginning in 1982 and continuing each year until it was discovered in 2004 was in the range of \$130 million, which reduced the unanticipated 2004 gain of the combined MSRPS pension investments from about \$650 million to about \$525 million for that year. (Custis, Tr. VII-24.)
214. As a result of the coding error, Milliman reported to MSRPS that the liabilities of the three (3) affected retirement systems had to be increased as follows: \$87.2 million for the State Police, \$24.8 million for judges, and \$16.1 million for local law enforcement personnel, for a total increase in liability of approximately \$131.7 million. (Tabs 6, 194, Rule 4 File; Krome, Tr. III-32.)
215. For fiscal year 2006 the total actuarial asset valuation of the retirement and pension plan for State police was \$1.302 billion; for judges, \$274 million; and for LEOPS, \$352 million; while the total of all MSRPS assets that year amounted to \$33.293 billion. (Pages 1-3, 8, 9 and 10, Tab 16-2006, Rule 4 File.)
216. The previously unamortized liability of MSRPS arising from Milliman's coding error is now amortized to achieve full funding in accordance with SP&P §21-304(d)(1). (Respondent's Exhibit No. 18.)

217. Had Milliman correctly calculated the required employer contributions at the times that they were certified to MSRPS to be presented to the governor and appropriated from the State budget, the total required cost incurred by State taxpayers between 1982 and 2004 would have been approximately \$34 million, compared to current and future liability valuation totaling approximately \$180 million which is now being incurred and will continue to be incurred over the course of about the next twenty (20) years to make up for the underfunded status of the retirement and pension systems for which Milliman incorrectly calculated required employer contributions for twenty-two (22) years. (Moye, Tr. V-36; Gold, Tr. IX-202; E. 166, 167.)
218. According to the Proof of Costs submitted by MSRPS, damages accruing from 1982 as a result of the Milliman coding error was corrected effective July 1, 2005. (Mowery, Tr. IV-107.)
219. The aforesaid correction was made by amortizing the \$131 million total additional liability determined to have resulted from Milliman's coding error, for which extra contributions toward the three (3) affected MSRPS systems commenced in fiscal year 2006, continue to date, and are projected for the future. (Maloney, Tr. VIII-63; Boland Tr. X-54, 100.)
220. The schedule for repayment of the shortfall arising from Milliman's error calls for payments of about \$4.5 million in fiscal year 2006, \$4.7 million in fiscal year 2007, \$4.9 million in fiscal year 2008, \$5.3 million in fiscal year 2009, and rising to \$10.9 million in fiscal year 2030, the final year of the twenty-five (25) year amortization. (Respondent's Ex. No. 18.)
221. For fiscal year 2005, prior to the discovery of the coding error, the employer contribution rate for State Police was zero, but in the following fiscal year after adjustment in part to make up for the deficiency in funds caused by

Milliman's underestimate of pension liability, the employer contribution rate was set at 8.22% of salary. (Krome, Tr. III-33.)

222. Also for fiscal year 2006, the necessary contribution rate certified by DBM after discovery of Milliman's calculation error was 41.12% for judges and 38.47% for LEOPS, but 5.76% for state employees. (Respondent's Ex. No. 3; E. 386.)
223. Calculated on the basis of the sum needed to make MSRPS whole from the losses sustained as a result of Milliman's errors, and determined within a reasonable degree of certainty, the damages incurred by MSRPS to the three (3) affected systems totaled \$72,965,148 as of 2005, that figure representing all funding contribution deficiencies since 1983 resulting from Milliman's actuarial calculation errors. (Mowery, Tr. III-190; E. 634, 653.)
224. The aforesaid \$72,965,148 total loss incurred by MSRPS includes \$34,208,960 in deficient contributions over the course of the 22-year period during which the coding error was made plus \$38,756,188 in lost interest on the investment return on that deficiency during the period involved, each year compounded. (E. 634, 635.)
225. Specifically, the total loss claimed by MSRPS in the amount of \$72,965,148 includes \$48,209,405 to the State Police retirement fund, \$21,082,926 to the judges retirement fund, and \$4,672,817 to LEOPS.
226. Included in the aforementioned aggregate figures from the MSRPS Proof of Costs are: for the State police, \$23,523,891 in additional contributions that would have been received but for Milliman's calculation errors plus \$24,685,514 additional interest that would have been earned on the unpaid contributions; for judges, \$7,715,436 in additional contributions and \$13,367,490 in additional interest; and for LEOPS, \$2,969,633 in contributions and \$703,184 in interest; for a total of \$34,208,960 in lost additional

contributions and \$38,756,188 in lost interest for the three (3) affected funds. (Respondent's Ex. 15.)

227. Between 1982 and 2008, actual MSRPS liabilities varied from predictions made a year earlier by as much as \$998 million less in fiscal year 1992 and \$964 more in projected liability in fiscal year 2005. (Appellant's Ex. No. 6.)

228. The total of lost contributions in the amount of about \$34 million as more specifically set forth above constitutes only about one quarter of one percent (.25%) of the \$13 billion in total contributions recommended by Milliman to MSRPS to be paid and actually paid as a result of Milliman's annual actuarial evaluations for MSRPS.

Decision

Because of the unusual magnitude and posture of the instant appeal, some preliminary words about the jurisdiction and authority of the Maryland State Board of Contract Appeals (Board) may be in order. Contracts for the State to procure goods or services from private vendors are subject to a statutorily established dispute resolution procedure mandated by Subtitle 2 of Section 15 of the State Finance and Procurement Article of the Annotated Code of Maryland (SF&P). COMAR §21.07.01.06 requires that state procurement contracts contain among other mandatory provisions a clause by which the parties agree to resort to this procedure for resolution of any claim that may arise concerning breach, performance, modification or termination. It is admitted that the four (4) contracts here at issue entered into by and between MSRPS and Milliman in 1982, 1990, 1993 and 1998 included that provision and agreement. Jurisdiction of the Board is properly invoked pursuant to SF&P §15-211 and COMAR §21.02.02.02 and is not contested. Essentially the Board serves in a capacity separate and autonomous from any other State agency, hearing formal evidence of record, whether physical, documentary or testimonial, and thereafter determining and then applying its

findings of fact in accordance with law, including statutes and regulations as well as judicial and procurement precedent, in order to render an independent final determination as to the legitimacy and sufficiency of claims set forth by a state agency or contractor.

In the instant dispute, a final determination was made by respondent MSRPS via correspondence dated February 14, 2008, contained at Tab 5 of the voluminous multiple binders of thousands of pages of documents produced by the State pursuant to COMAR 21.10.06.04 and collectively referred to in common parlance as the Rule 4 File, introduced into evidence in this proceeding and more easily found in respondent's post-hearing two-volume Record Extract (E.) beginning at page 539. That determination on behalf of MSRPS was made by its authorized procurement officer and includes factual and legal findings that Milliman breached its four (4) consulting contracts for professional actuarial services and that as a result of that breach, which was ongoing for more than twenty (20) years, MSRPS was caused to sustain damages in the amount of \$34.2 million in contributions that MSRPS would have received but for Milliman's errors, plus \$38.8 million in lost income that MSRPS would have earned on those contributions but for Milliman's errors.

MSRPS duly authorized the Office of the Attorney General to pursue this claim against Milliman, which had been formally initiated by MSRPS correspondence dated February 9, 2006. MSRPS thereafter invited and considered Milliman's defense in response to the claim and the aforesaid final agency decision was ultimately rendered and approved by the Executive Director of MSRPS and set forth in writing two (2) years later. That correspondence, affirming a claim for damages by MSRPS against Milliman in the total sum of \$73 million commenced the tolling of the administrative statute of limitations for the noting of an appeal before this Board, and Milliman properly noted its appeal in timely fashion. Pursuant to SF&P §15-223 and COMAR 21.10.01,

the instant decision completes exhaustion of administrative remedy and constitutes a final enforceable judgment subject only to judicial review in a court of competent jurisdiction in accordance with Title 10, Subtitle 2 of the State Government Article of the Annotated Code of Maryland, the State Administrative Procedure Act (APA).

Presented for determination by this Board is the question of whether Milliman is indebted as alleged by MSRPS. In making that determination the Board is not bound by any previously rendered finding or conclusion. The Board must review all probative evidence admitted, afford each aspect of that evidence the weight to which it is entitled, and in light of that factual evaluation render a fair and just decision as dictated by law. While MSRPS has previously determined Milliman to be liable, this Board reviews its claim anew as a first impression. Though Milliman is the appealing party, in order to recover, MSRPS must bear its burden of establishing by a preponderance of the evidence all requisite elements of proof, in this case, (1) that Milliman was negligent, (2) that Milliman's negligence constituted a breach of contract, and (3) that such negligent breach was the proximate causation of known, quantifiable and proven material damages.

Thus, the claim is a hybrid in the sense that it is founded in contract, but also requires a determination of negligence in the performance of contractual duties. The contracts at issue are the four (4) agreements under which Milliman provided actuarial services to MSRPS from 1982 until 2005, also admitted into evidence, contained in the Rule 4 File and set forth at E. 500-538, according to which, for good and valuable consideration paid and received, Milliman owed to MSRPS certain express obligations as set forth in the written provisions contained in Milliman's contracts arising from MSRPS work solicitations and Milliman's responses thereto. In addition, the contractual agreements between the parties include various implied responsibilities and duties owed by Milliman to MSRPS, including

that Milliman's actuarial consulting services would be performed in compliance with all applicable professional standards of care in force at the time and place the services were rendered.

As a result, to determine whether Milliman breached its contract with MSRPS, this Board is tasked first to evaluate whether Milliman's actuarial consulting services rendered at the request of or on behalf of MSRPS were performed consistent with the applicable standards of professional actuarial care. As more elaborately detailed in the foregoing Findings of Fact, on this point a robust disagreement among highly competent experts sheds considerable light on the question, albeit from conflicting points of view.

On the one hand, respondent's chief expert, Mowery, examined Milliman's work and rendered a thorough, thoughtful, and definitive conclusion that Milliman violated the applicable standards of professional care when its actuarial methodology misinterpreted the meaning of the codes on the MSRPS retirement tapes and thereby underestimated correct liabilities, a mistake which was replicated for 22 years. On the other hand, appellant produced a litany of competent expert witnesses, some of whom had first hand knowledge of the facts at the time of the original commission of the error that is the subject of this appeal. Naturally, the experts offered by Milliman reach the opposite conclusions as Mowery's *post hoc* critique of Milliman's job performance. In pointing out the disparity in number of supporting witnesses, one of Milliman's witnesses testified that because so many actuaries supported Milliman's defense in comparison to Mowery's lone opinion to the contrary, this Board should be compelled to find for appellant. However, simply outnumbering experts is surely not the best manner of rendering an intelligent evaluation of the worth of their opinions. It may be fairly said that all actuaries have a stake in the outcome of the instant proceeding, which poses the possibility of a variety

of significant future challenges to the profession, both foreseeable as well as unanticipated in present light.

As Milliman's multiple witnesses properly emphasized, persons examining this dispute more than 25 years after the alleged error enjoy the enormous benefit of 20/20 hindsight. That is to say that Mowery knew about the coding error at the time that he conducted his critical evaluation. And this Board knew about it too. So it is easy at the present time to point the finger of fault at Milliman now that Milliman itself has appropriately discovered and disclosed the error it initiated in 1982. Like Mowery, after such discovery and disclosure, this Board is powerless to erase that knowledge; but also like Mowery, it is entirely possible and incumbent upon this Board to look back in time to evaluate what precisely Milliman did and did not do over the course of its work for MSRPS and retroactively to determine whether Milliman's work complied with the applicable standards of professional actuarial care then in force.

Such an analysis must begin with the Board's identification of the applicable standard of care. In this regard, the historic Guides to Professional Conduct adopted by the American Academy of Actuaries and in force in 1982 offers guidance in requiring that the "actuary will act...with scrupulous attention...to ensure that any calculations or recommendations made by him...are based on sufficient and reliable data." This early statement of actuarial responsibility seems plainly intended to transfer to some extent from the client to the actuary the duty of insuring that the actuary correctly knows and properly uses in its methodology the information provided by the client. As stated, the actuary bears the obligation of ensuring that all calculations are based on sufficient and reliable data. In other words, actuaries bear an affirmative obligation to make whatever inquiry of the client may be necessary depending on the circumstances to assure that the actuary correctly understands the client's data, which is ordinarily made available by computerized coded information.

While the actuary may be blameless for the client's incorrect information, the actuary is responsible for securing clarification of the client's confusing information.

Even more directly instructive to the Board's understanding of actuarial responsibility in connection with the instant dispute is the obligation set forth in ASOP No. 4. This ASOP was not written and adopted until after 1982 but, though it was then unwritten, expert testimony substantiated the uncontested view that the duties set forth therein were nevertheless binding in spirit and practice upon all of the actuarial work done by Milliman for MSRPS. The express statement of that responsibility as formally established in 1993 in §5.2.2 of ASOP No. 4 is simple and straightforward: "All provisions of the plan adopted and effective on or before the start of the plan year should be taken into account in measuring pension obligations." Between 1982 and 2005 Milliman failed to take into account in measuring MSRPS pension obligations the correct payment provisions of three (3) of the plans for which they were hired to perform actuarial calculations, not including the legislative retirement plan. Whether viewed by hindsight or foresight, this constitutes a plain violation of ASOP No. 4. As MSRPS representatives testified, understanding and fully taking into account in its actuarial calculations the correct pension plan provisions is what the actuary is hired to do. Failing correctly to account for the form and duration of retirement payments represents a fundamental flaw in actuarial analysis. Unless excused, failure accurately to include the correct payment provisions of a pension plan constitutes professional negligence for which the actuary may be justifiably found in breach of contractual obligation and professional duty.

Harking back to the historic Guides to Professional Conduct, ASOP No. 4 offers further direction to support the Board's examination in this regard. As set forth in §5.2.3(a), "If the actuary is not satisfied as to the reasonableness of the

information [provided by the client], further inquiry should be made until the actuary is so satisfied." In the case at bar it is readily admitted that the data provided by MSRPS to Milliman in 1982 was confusing to Milliman. That is why Milliman made inquiry into the meaning and location of the codes on the MSRPS data tapes, as it had to do and well it should have done. So the question that must be answered in evaluating Milliman's level of professionalism in its work for MSRPS is whether Milliman did enough. The above quoted excerpt from §5.2.3(a) of ASOP No. 4 cannot be interpreted absolutely to absolve the actuary of all responsibility of making further inquiry whenever the actuary may be unilaterally satisfied with or without good cause. Only in those cases where the actuary is *reasonably* satisfied, that is, where there may exist sufficient cause for the actuary not to make the further inquiry mandated by ASOP No. 4, should the actuary be found immune from liability for its errors.

Here, in 1982 as Milliman undertook its first calculations for MSRPS it relied for critical work components upon the efforts of one of its employees, Moeller, an actuarial student at that time who was not yet a Fellow of the Society of Actuaries and had limited prior experience. It is not contested that Moeller, in accordance with applicable ASOPs, contacted the appropriate MSRPS representative, King, as she attempted to decipher MSRPS codes identifying forms of payment and their location on MSRPS data tapes. Miraculously and to the credit of both Moeller and Milliman, Moeller left a written memorialization of one of those telephone conversations when she noted, "0 = SLA."

Though she cannot now recall that particular telephone conversation in 1982, Moeller insists that at the time she noted her understanding of the pertinent MSRPS Code, her discussion with King concerned MSRPS pension plans for police and judges. However it is also undisputed and quite natural that the focus of everyone then working on the actuarial calculations, whether they worked for Milliman or MSRPS, was on the substantially larger

plans, namely, those for teachers and state employees, with many times the liability at stake as the comparatively slight total pension obligations arising from future payments due the much smaller numbers of retirees and active employees included in the State police and judges' pension plans.

Without other evidence except by mere unsubstantiated speculation, it is impossible at the present time to determine with any degree of confidence or certainty whether Moeller indeed asked King in 1982 on the phone specifically if code "0" meant straight life annuity for State police and judges. The Moeller note itself does not reflect that. Her note is accurate only to the extent that it refers to MSRPS pension systems other than the ones for judges and police. Contrary to Moeller's recollection decades later, it is indeed possible that she asked King if code "0" on the retiree tape meant straight life annuity for teachers, in which case her notation would have been correct. It is also possible that Moeller asked about the meaning of code "0" without specifying which particular disparate plan was intended to be the subject of her inquiry. More importantly, irrespective of what Moeller now thinks she may have asked King in 1982, and irrespective of what she may have intended to ask King at that time, it is impossible at the present time to determine whether King reasonably believed in 1982 that Moeller's inquiry of him during that particular telephone conversation pertained to benefits payable to the participants of the teachers' retirement system, which was by far the largest of the six (6) MSRPS systems that were then under evaluation and therefore of principal concern to both Moeller and King.

As the person on behalf of the plan sponsor primarily responsible for the MSRPS coded data tape, King presumably understood correctly the meaning of the codes on the tapes he created and maintained. He surely had no motive to misrepresent that understanding to Milliman and every reason to assure that Milliman correctly interpreted the meaning of the codes. The

most reasonable explanation for the terrible misunderstanding that undisputedly occurred between Moeller and King in 1982 is that Moeller may well have believed that her inquiry about the meaning of the "0" code pertained only to State police and judges, while King believed that her inquiry pertained to the other pension plans which were also the subject of their communications.

Moreover, the extraordinary ordeal to which both parties to this appeal have been subjected could have been averted in its entirety if Moeller had simply shared with MSRPS her notes or some other memorialization of her conversation with King that could have revealed her false understanding of the meaning of the MSRPS "0" code. Today it is easy to imagine that instead of a telephone conversation, Moeller might have communicated with King via e-mail, a record of which might well illuminate the true fault that caused the coding error that occurred. Or prior to the advent of e-mail, a fax might have been sent by Moeller to MSRPS for timely review, stating something to the effect that, "per your advice, we understand that 0 = SLA form of payment for all six (6) MSRPS pension plans."

Of course, the Board fully appreciates that neither e-mail nor fax communication technology existed in 1982, but the postal service has been around for some time and it would have been a very simple matter for Moeller or anyone else at Milliman to have written a memo or jotted a note to MSRPS, translating or supplementing the shorthand set forth on the MSRPS Annual Valuation Record and Codes and Flags memorandum and confirming its interpretation of MSRPS codes to make sure that Milliman's inquiries had led to a correct understanding of the meaning of the MSRPS data codes. This was Milliman's duty and responsibility, if needed to avoid an interpretation error. Had such a letter been sent to MSRPS, Milliman may well have avoided any liability whatsoever, possibly because the error in Milliman's methodology would have been caught by MSRPS and after

detection, corrected before the first computer batch run; or at the very least because Milliman could today justifiably point the finger at MSRPS as the culpable party in causing the mistake by misinforming Milliman and thereafter failing to correct their documented misinterpretation. But no such documentation exists, nor allegation by Milliman that it notified MSRPS that Milliman interpreted code "00" as SLA for all systems. Milliman did not undertake the simple step of sharing with MSRPS Milliman's continuing confusion regarding the meaning of MSRPS codes and as a result, MSRPS did not have an opportunity to correct Milliman's error. To sum, this Board finds that it was a violation of the applicable standard of professional actuarial care for Milliman, without further notice to nor inquiry of MSRPS, to make the decision to proceed with its flawed methodology arising from the coding error when Milliman could and should have taken further steps to assure the accuracy and reliability of its interpretation of the data it was provided, namely, by sending a letter or memo confirming Moeller's phone conference with King and the misunderstanding that occurred at that time which is the gist of the entire claim.

Much was made in the testimony of experts on each side of this contest concerning Milliman's obligation to review its initial calculations in 1982 with those made by the predecessor actuary, Buck, the year prior, and whether the discrepancies thereby noted should have alerted Milliman to its error from the outset. The duty to compare one year's calculations against the prior year's calculations is expressly suggested in the sentence of §5.2.3(a) of ASOP No. 4 immediately prior to the provision of that section just discussed. As applied to the instant case, specifically with respect to the information provided by MSRPS to its actuary, ASOP No. 4 requires that Milliman "should verify its reasonableness, both directly and against other available information, such as prior year's data and reported benefit payments." However, the Board finds that this aspect of the

actuarial obligations contained in ASOP No. 4 should be fairly and reasonably relaxed under the circumstances that existed here in 1982. That is because when Milliman undertook its first actuarial evaluation for MSRPS, both Milliman and MSRPS understood that Buck's calculations were flawed. Therefore, to expect or require that Milliman's anticipated correct evaluation of MSRPS liabilities match up against Buck's incorrect calculations would have been folly. That Klug calculated 15.897 as the average annuity factor for Buck's 1981 valuation of the police retirement system, while Milliman calculated a factor of 11.817 for the following year, is not sufficient in and of itself to fault Milliman for not catching its coding error.

Some degree of mystery does remain with respect to Milliman's apparent recognition that the number of retired police increased between 1981 and 1982 from 288 to 339 or 341, a jump of about 20%, while strangely, Milliman's calculation of liability decreased slightly from Buck's tabulation even though it was well understood at that time that Buck's calculations were undervaluations, not overvaluations of MSRPS liability. Why did Milliman simply accept without closer examination its determination of decreased liability for this plan, when Milliman's calculations gave rise to dramatic increases from Buck's determination of liability for other plans? One would have expected the opposite result, namely, that Milliman would have to increase Buck's valuation of police retirement liabilities and that the increase for this particular group should have been especially sharp due to the sudden increase in the pool of retirees between 1981 to 1982. But somehow this discrepancy failed to raise any concerns that might have been evident at that time from a closer examination of the disparate average annuity factors. Even one of Milliman's own expert actuarial witnesses, Gold, testified that he would have probed further faced with such a discrepancy. While this Board does not conclude that Milliman's failure to act as Gold would have acted

rises to a level constituting a negligent violation of the applicable standard of care *per se*, Milliman's failure to undertake any additional investigation in this regard is nonetheless indicative of a cumulative climate of missed opportunities which permitted Milliman to correct its error had red flags been adequately addressed rather than ignored.

A more powerful example of those missed opportunities is evidenced by the hand-written notes made in 1982 by another of Milliman's employees working on MSRPS valuations, namely, actuarial student Klug, who repeatedly supplemented Milliman's early worksheets, observing that the normal form of payment for judges and police was not single life annuity, but instead, joint and one-half survivor benefits. Klug's notations point directly to the valuation error that Milliman's calculation methodology contained by wrongly classifying judges and police with SLA as normal form of payment when it should have valued those liabilities higher as J & $\frac{1}{2}$ S. Yet, despite Klug's notes to that effect, at one point during Milliman's second year of valuations for MSRPS even stating in writing, "how to handle Δ [different] options...Confirm procedure & check it out", Milliman apparently never did take any action to investigate whether its calculation methodology was correct nor to assure that the full liability associated with judges and police was properly tallied for their requisite extra retirement benefits and costs. Instead, Milliman simply repeated the same error year after year, wrongly classifying the normal form of payment for judges and police retirement benefits as single life annuities. To sum, Milliman failed to deliver its promise of coordinated supervision and peer review by FSAs to conduct and assure accurate actuarial analysis for MSRPS.

Finally, Milliman missed another patent opportunity to correct its error when it began valuing the new liability arising from the creation of LEOPS in 1991. At its inception, LEOPS had only twenty (20) retired members. Even if the smaller retirement

systems were misconstrued by Milliman during the rush, confusion and funding dilemma faced in the early couple of years of their work during the course of the difficult initial transition period when actuarial responsibility was transferred from Buck to Milliman in 1982 and Milliman thereafter performed its second annual valuation in 1983, enabling that actuary its first chance to compare its own calculations from one year to the next; someone at Milliman should have noted a problem with LEOPS nearly ten (10) years later, when Milliman had gained considerable experience working with MSRPS well after the activity in response to the retirement funding crisis of the late 1970's had subsided.

Milliman contends that it expected code "03" to appear in MSRPS retiree data records when the normal form of payment was a joint and one-half survivor benefit. Someone at Milliman therefore could have inspected the mere twenty (20) records contained in the new LEOPS retirement data file in 1991 and observed that those retirees generally were not coded "03" as Milliman might have expected, but instead were coded "00," which Milliman thought it would find only for those limited number of retired police who were unmarried, widowed, or otherwise single at the time of their death, thus abrogating the continuing one-half survivor residual benefit to which all police are entitled by law as their normal form of payment. Did Milliman in 1991 note this discrepancy and accept that LEOPS retirees had no surviving spouses, in direct conflict with the probabilities known from its own tables of statistical expectation for retirement, marriage and mortality? More probable, in the absence of evidence of some investigation, it would appear that no one at Milliman looked at the LEOPS retirement data for those twenty (20) retirees contained in the initial file transmission in 1991. Milliman simply replicated its prior flawed methodology without taking the time to check so few a number of retirees as would have been necessary to assure that the methodology it developed and applied in 1982 was based on a correct

understanding of MSRPS retirement codes, which Milliman continued simply to assume to be correct. Once again, this failure constituted a breach of the applicable standard of professional actuarial care in violation of the obligations set forth by ASOP No. 4.

Having noted by the foregoing discussion repeated instances of breach of the applicable standard of care, the Board turns next to an analysis of whether those breaches were excused. On this point Milliman argues that MSRPS was contributorily negligent because its retiree data tape was inadequately explained, not up to industry standards, and was otherwise created and maintained in a negligent fashion. The only direct evidence on this important point is provided by Milliman's retained expert witness on data records, DeLutis, but that is not to imply that the Board is bound to accept his views even though they were not formally rebutted by another expert. A noteworthy deficiency of Milliman's presentation through DeLutis is that this witness has no actuarial expertise and his opinion is therefore without due regard to the unique responsibilities borne by actuaries with respect to their special duty to understand the data provided by their clients.

In his report and by his initial testimony DeLutis seemed to contend that MSRPS violated some established, industry-accepted standard of care because MSRPS failed sufficiently to document what MSRPS meant when it reported to Milliman that "00 = Maximum" in the pertinent data file position describing normal form of retirement payment. But when pressed, he conceded that at least one of the principal statements of the applicable standard of care upon which he relied was simply a recommended guideline for use when providing data to federal agencies. That standard is not imposed upon anyone and was not written to govern state or private entities at all. Persons or agencies that maintain data records can format their data as they please. Indeed, to the extent that the testimony of DeLutis was effectively asserted, it

established that there is no particular standard for coding data. The requirements of a data dictionary vary depending on innumerable factors. Absent a showing of an applicable standard of care, it is impossible to demonstrate that MSRPS violated an applicable standard of care.

It is true that the data dictionary used by MSRPS in 1982 was not a model of clarity, and also that its statement explaining MSRPS codes was rewritten in 2004 eliminating the word, "maximum," and substituting for it, "basic allowance." It is further substantiated that "maximum" is not a term ordinarily used by actuaries to describe normal form of payment. But again, this is not to assert that the MSRPS codes here questioned were false, faulty or otherwise negligent as a matter of law.

MSRPS might have rejected numerals altogether and instead employed alternative codes, such as "SLA" for straight life annuity and "J&S" for joint and one-half survivor benefits. In that fashion, teachers, for example, would generally be assigned the code "SLA" unless they selected an option, while police and judges would generally be assigned the code "J&S" unless they were unmarried at the time of retirement. While it may have avoided the confusion that occurred here, however, this example is purely hypothetical. No one is contending that MSRPS had the obligation to code retirement payments in this fashion. MSRPS was and remains free to assign numerical rather than alphabetical codes to denote forms of payment. MSRPS also was and remains free to use the code "00" to denote the normal form of payment even though that form varies between pension systems, constituting SLA for teachers, but J&S for judges and police.

The only qualifying obligation on the part of MSRPS as plan sponsor is accurately to reflect the meaning of its codes as a part of its data dictionary, which MSRPS achieved when it provided to Milliman its written Annual Valuation Record and Codes and Flags memorandum. Those documents, viewed in light of the pertinent statutes and employee brochures describing

retirement payment provisions, were sufficient to notify Milliman fully and fairly of the meaning of relevant MSRPS codes. Milliman has undoubtedly seen and continues to encounter innumerable variances in the meaning of a multitude of alphanumeric codes used by disparate pension plan sponsors. Indeed, as more elaborately discussed above in this Decision, to the extent that the coding used by MSRPS was confusing to Milliman, the actuary bore the obligation of soliciting further clarifying information until it accurately understood the information provided to it by its client. Having previously asserted, "the data furnished to us are, in our opinion, sufficient and reliable for the purposes of our calculations," Milliman is estopped from asserting today that the data furnished to it by MSRPS was deficient. Though it is certainly true that MSRPS might have done a different and even a better job with its data dictionary, it cannot be said as a fair or fitting legal conclusion that MSRPS was negligent in the development or transmission of the coded data it provided to its actuary. As a consequence, Milliman's breach of contract is not excused by any conduct on the part of MSRPS. Thus, we turn finally to the question of damages.

Having found by a preponderance of the evidence that MSRPS is entitled to recover losses arising from Milliman's negligent breach of contract, this Board must decide whether damages were incurred, whether they were sufficiently proven, and if so, ascertain what certain sum MSRPS should receive in order to place it in the position that it would have been in had Milliman not breached its contracts for actuarial consulting services with MSRPS. This is the generally accepted standard for quantifying losses arising from breach of contract. Beyond this opening point, the parties to this dispute agree on little. Milliman claims that damages should be calculated as of the date of the instant Decision even though the Board has no evidence before it regarding market performance since the close of the hearing, or

more importantly, MSRPS return on investment since that time. MSRPS claims that damages should be fixed as of the date they were determined, amortized, and for which future payments commenced. MSRPS claims \$73 million; Milliman contends that even assuming *arguendo* that there may be any liability justified by a prospective finding of negligent breach of contract, damages are nil.

Milliman's argument against damages is supported by another of its experts, Boland, who is highly experienced in academic economic theory and financial aspects of environmental issues, but whose testimony and reports are of very limited usefulness to the instant dispute. Boland asserts that there should be no difference in rates of return on long-term investments, such as those used by MSRPS, as compared to short-term investments, such as those used by the General Fund of the State of Maryland. This contention may stimulate academic discussion, but it flies in the face of common knowledge as well as demonstrated rates of return. Moye testified at the time of the hearing that the current annual rate of return of the General Fund is the three (3) month Treasury rate of 2.5%, while the benchmark over the longer term investments held by MSRPS is 7.75%. This is because assets held for a longer term by MSRPS can take advantage of higher performance opportunities than the statutorily restricted short term lower-risk investments required of the General Fund.

Another example of the weakness of Boland's academic argument in this regard is publicly well known and readily available to anyone who seeks to examine rates of return for United States government bonds, which in the present time frame are about .4% for one-year bonds, .9% for two-year bonds, 2.3% for five-year bonds, 3.4% for ten-year bonds, and 4.2% for 30-year bonds. Much more significant to the instant analysis, however, is the *actual* rate of return enjoyed by MSRPS during the period of the Milliman breach, namely 1984 to 2005, compared to

the *actual* rate of return of the General Fund. Those rates are identified without dispute. General Fund investments earned an average of 5.62% over the relevant time period while MSRPS investments earned 11.10%. Though it is conceivable that certain short-term investments could outperform certain long-term investments depending on the particular investment and the times of deposit and withdrawal, that possibility is irrelevant to the calculation of actual damages here sustained. Speculative damages are not allowed.

A third aspect of Boland's theoretical economic analysis is similarly postulated without regard to the statutory and policy investment restrictions placed upon the General Fund as compared to MSRPS investments, by which he compares risk-free investments by the General Fund against risk-free investments in pension funds. Again, while providing interesting insights into abstract economics, such an analysis has little if any utility to an examination of the instant dispute, in which this Board is tasked to analyze and determine damages actually sustained, not an academic hypothetical ignoring the disparate investment strategies and resulting rates of return which are allowed for public funds by Maryland law.

Even farther removed from reality, in another portion of his analysis, Boland takes the 21% drop in value of MSRPS funds during the first six (6) months of FY-'09, extrapolates that loss for the second half of the year fallaciously asserting a 42% estimated total decline for the past fiscal year, and declares therefore that the return on investments for MSRPS funds underperforms the rates of return for the General Fund. As more professionally expressed at the hearing, this aspect of Boland's conclusions does not pass the most rudimentary sniff test. Instead of making his calculations based upon incorrect pessimistic projections of future market performance at the trough of the greatest market decline in decades, Boland could have instead used known rates of return through the end of fiscal

2008, for example, in which case the MSRPS rate of return would total 8.7% compared to 5.5% for the General Fund. The notion that long-term investments perform worse than short-term investments is not only counterintuitive, it is demonstrably false.

The Board also rejects Milliman's request to ascertain damages as of the date of the instant Decision. The amount of MSRPS losses was fixed and definitively known on June 30, 2005. When the certified rates of pension and retirement contribution took effect the following day at the beginning of the first fiscal year that the correct actuarial calculations for the three (3) affected systems commenced is the date that damages were determined with certainty and the enduring process of restoring the deficiency began. It is also the date that the quantum of MSRPS losses here vested. How the market may have performed for MSRPS since July 1, 2005 is irrelevant to this appeal.

A more persuasive position on the question of damages was posited by Maloney, explained during his testimony using a "right pocket/left pocket" analogy referenced in Milliman's brief as the "unitary creditor doctrine." By this argument Milliman asserts that the State is a single entity comprised of many constituent agencies like MSRPS. Funds that are taken from the General Fund, or right pocket, and deposited into sub-entities like MSRPS, the left pocket, do not result in any gain or loss to the entity itself, only transfers from one pocket to another in a single pair of pants.

This conception is accurate to the extent that MSRPS is an appendage of the State of Maryland. MSRPS is indeed a component of the State. It is created by State law. MSRPS carries out an important State function upon which State employees, retirees and their families rely. The full faith and credit of the State stands behind MSRPS liabilities. The State lists and includes MSRPS funds as a part of its fiduciary assets. The State is guarantor of MSRPS obligations. The Governor of the State

authorizes state revenue to be allocated to MSRPS as a part of the annual State budget in accordance with State law and that appropriation is authorized by approval of the State legislature.

However, the State of Maryland is not a party to this proceeding. As fully substantiated by examples and succinctly but effectively expressed by counsel for Milliman in its brief at page 68, "The System [MSRPS] cannot be heard here to complain on behalf of the State. The claim before the Board is a claim by the System on behalf of the System. The System has been adamant in the position that the State is not a party to this proceeding and has repeatedly taken the position in pleadings and correspondence that the State is not a party to the claim and plays no role in this case...The Board heard no evidence from the State, or any witness purporting to speak on behalf of the State..." and at page 21 of its reply brief, "the System does not speak for the State, or the taxpayers, neither of whom are parties to this case." Or as one might assert using Maloney's pants pocket analogy, only the left pocket is a party to this proceeding. Impact of the instant decision upon the right pocket, the General Fund, is irrelevant to the specifically and deliberately limited claim of the left pocket, MSRPS.

As a matter of law, funds held by MSRPS are quite distinct from all other State funds. As Maloney intimates, the State maintains many funding pools for which various program supporters are inclined to view such funds as separate and independent from the General Fund, sacrosanct from expenditures other than those for which revenue has been specifically directed and restricted, the Transportation Trust Fund or Program Open Space, for example. Yet, Maloney would correctly assert, whenever the legislature is in session, it is conceivable and possible to change the rules, repeal restrictions and raid funds intended for one purpose in order to use them for another. In this sense restricted pots of revenue are all part of the State's assets and may legally be transferred for General Fund use should the Governor and

legislature so desire and therefore facilitate enactment of a change in law, irrespective of whether or not such action would constitute good public policy.

But this Board is not convinced that MSRPS funds may be classified as just another of the State's special funds. MSRPS funds are unique in several ways. All of the State's retirement and pension system funds are assets held in trust as governmental plans under the Internal Revenue Code (IRC) 26 U.S.C. §§ 401(a) and 414(d), which confer tax benefits under IRC §§ 414(h)(2) and 501(a) to such qualifying funds held not on behalf of the State but instead, on behalf of the participating members and their beneficiaries. MSRPS funds are held not for public use as other special funds are held to be used to build or acquire such public amenities as roads or newly purchased park property, for example. MSRPS holds its funds strictly in a fiduciary capacity to be paid to private individuals for use as they please, upon the occurrence of a certain future condition, namely employee retirement, presumably as set forth in current law and employment contract provisions establishing binding contractual obligations. Legislative encumbrance of vested retirement benefits or those promised to become vested at a future time certain, could well be subject to effective court challenge and reversed as retroactive impairment of contract. This Board does not reach such a conclusion today, but only notes that assets held by MSRPS are not assets of the State in the ordinary meaning of State assets. Instead, they are uniquely held by MSRPS in fiduciary trust on behalf of others.

Contrary to MSRPS assertions, Maloney is correct in his global view without regard to the confines of process in the instant proceeding that damages incurred by MSRPS by virtue of underfunded contributions to one pocket may be offset by the resulting extra revenue therefore available in the other pocket, the General Fund, at least to the extent of the principal amounts for which appropriation of properly amortized MSRPS allocation

should have been made but wasn't. In future legal proceedings concerning this dispute (and it would be naïve for the Board not to anticipate the same), it may be possible for Milliman to pursue a subrogation claim against the State or to name the State as a party defendant or co-defendant in a newly filed cause of action by way of an appeal from this Decision, though that is not to suggest that a Court could assert primary jurisdiction over such a claim prior to exhaustion of administrative remedy, nor to say whether such a claim would be timely filed.

It is also conceivable pursuant to Rule 2-211 or 2-212 of the Maryland Rules of Procedure for the Circuit Court (or Rules 19 or 20 of the Federal Rules of Civil Procedure, assuming the presence of federal jurisdiction) or otherwise, for a party to seek to join the State or another party or parties in this contest in order to pursue a set-off claim to the extent that such a joinder and set-off may be allowed. On the other hand, it is also possible that neither joinder nor set-off may be permissible at this late date. If the State had been a party to these proceedings, and that assumption is not to suggest that that would or would not have been allowed in the instant claim, it is likely that the Board would have heard specific testimony from Milliman in an effort to eliminate the MSRPS principal contribution deficiency by set-off in the same amount of additional revenue remaining on hand in the General Fund in the State's favor, and possibly also to limit damages to investment losses arising only from the spread of interest gains between the rate of return on investment of MSRPS funds and those of the General Fund, for a total liability of only about \$19 million. But such issues are not before this Board and in the absence of a request by a named party, this Board will take no action *sua sponte* to include currently unnamed parties in this proceeding nor to determine whether others may be joined now or at some future time or what set-offs may or may not be proper or

necessary in the hypothetical event a third party may have been or may yet be included in this claim. At present the Board may and must fairly determine the instant dispute as pleaded only between MSRPS and Milliman.

An additional one of Milliman's alternative arguments against the award of any damages even in the face of a determination of breach and liability is that MSRPS is not harmed because, notwithstanding 22 years of Milliman's actuarial errors, it is undisputed that ultimately the retirement and pension systems will be fully funded in accordance with law. Of the \$132 million shortfall of which \$73 million needs to be repaid over time in order to accrue with interest and restore the full amount of that \$132 million deficiency by the year 2030, nearly \$20 million has already been paid to make up for that deficit. This position has some merit in that State tax revenue is used to achieve future full funding of MSRPS liability, whether or not the allocation of those State funds is or was made at the appropriate time, or at some other time. However, this perspective subverts the entire function and purpose of actuarial analysis, which is to determine how much to contribute and when.

If the Board were to accept this argument, an actuary could satisfy its contractual obligations to a client by training a monkey to punch random keys on a calculator. MSRPS, the Governor, and legislature could agree to appropriate the amount thus randomly determined to be allocated toward pension funding, with the understanding that some group of State taxpayers sometime in the future would make up the difference in the event of a deficit or reap the rewards in the event of a surplus, and the actuary would always be held harmless for any calculation error, no matter its basis or magnitude. Certainly this is not an acceptable standard of professionalism for actuaries, nor is it the one in force, nor would its adoption benefit any actuarial firm, nor does such a lax standard characterize the usual excellent work of the competent, impressive, highly trained,

skilled, and careful actuarial experts engaged by Milliman. Instead, the approval of such an argument would render actuarial calculations pointless.

Adopting this position would also undermine the extremely important statutory objectives of leveling contributions, protecting inter-generational equity, and pre-funding defined benefits. That the losses incurred by MSRPS have now been amortized and already partially restored is irrelevant to Milliman's responsibility because the reimbursement made to date is from a collateral source, namely budgets adopted in years subsequent to the years and in different amounts than the appropriations that should have been made and would have been made but for Milliman's error.

Also advanced as an argument to defeat any award of damages is a notion which is absolutely correct but utterly without import to this proceeding, namely, that with or without calculation errors, the overall value of retirement and pension assets and liabilities vary dramatically from expectations made at the time that actuarial analyses are used to predict and prepare for the future. Milliman accurately observes that this is the reason that actuarial projections are made each year, to provide course correction on an ongoing basis. That is true. Economic forecasts are frequently wrong and indeed expected to be imperfect, as became all too evident in the previous fiscal year, during which occurred an unprecedented worldwide collapse of corporate and private finance and entire market sectors, with untold trillions of dollars worth of equity unexpectedly wiped out in the span of just a few months. The extraordinary 20% loss from approximately \$30 billion in assets suffered by MSRPS last year as the result of the national economic downturn was highly unusual, but it is not unusual for the year-to-year asset valuation of large pension funds such as those managed by MSRPS to be at variance by hundreds of millions of dollars from anticipated and projected annual targets. So, says Milliman, a

calculation error of a mere \$34 million or even \$132 million is inconsequential when viewed in comparison to the dramatic swings in actual market performance on huge investments which are expectedly unpredictable with any degree of prescient certainty.

Again, adopting such a view would diminish the importance of the careful and complex work that is painstakingly performed by the application of specialized professional actuarial expertise. If actuarial calculations are to be considered unimportant because long-term financial planning is by nature bound to be off target and subject to the unknown vagaries of future investment performance, then seeking expert consultation and advice from actuaries would be completely unnecessary. Actuarial analysis is not meaningless, but instead, indispensable to proper and prudent fiscal planning. Simply because economic projections are imperfect and imprecise in no way diminishes the imperative or value of precision in making actuarial estimates fully and accurately predicated upon whatever known and correct objective data may be available to actuaries, nor does it diminish the necessity for actuaries to make their calculations accurately using that data.

Finally, related to this perspective is perhaps Milliman's most powerful point against an award of any damages in this proceeding, namely, that the contribution rates recommended to MSRPS by Milliman were consistently reasonable, or as stated by some of Milliman's counsel and witnesses, "fell within a range of reasonableness." The Board concurs with Milliman that it may not be fairly held to a standard of perfection. Milliman is not liable for any errors that are not material, nor for any errors that resulted in underfunding any retirement or pension system in an amount that does not reflect material damage. Had Milliman's error existed only for a year, for example, it is entirely foreseeable that this Board could deem the resulting nominal funding deficiency immaterial and therefore not recoverable. But the error complained of in this instance did not exist for just a

year. It continued year after year with compound interest over the course of more than two (2) decades and thereby grew to a total deficiency in excess of \$130 million.

Nonetheless, it is correct that a mere \$34 million in lost total contributions toward MSRPS pension systems is not a great deal of money in the context of many years of funding recommendations toward total pension liabilities amounting to tens of billions of dollars. But the sheer magnitude of assets held in trust by large pension funds does not alleviate or excuse the necessity for actuarial experts to exercise reasonable care to assure that actuarial calculations are based on an accurate understanding of pension plan provisions and to use that knowledge correctly when developing actuarial calculation methodology. Because Milliman failed to exercise reasonable care, and did so each year for 22 years, what would and should have amounted to a taxpayer liability of \$34 million then is now instead \$132 million, of which \$73 million in damages is today amortized and being repaid in order to remedy the calculation error and make MSRPS whole. This is material damage.

These are not nominal sums. The aforementioned deficiencies are particularly damaging to the three (3) relatively small pension and retirement systems that present the instant claim. It is admitted by both parties that the determination of whether actuarial negligence gives rise to losses sufficiently material to justify an award of damages for breach of contract must be evaluated in light of the losses sustained by each component system, not the consolidated total of MSRPS systems as a whole. That is because rendering individual and separate valuations of each retirement plan was an essential part of the actuary's contract obligation. Moyer testified that the three (3) affected retirement systems were funded only to the extent of amounts between 60% and 84% of full liability. The Board calculates that as of July 1, 2005, of the total \$132 million MSRPS deficit resulting from Milliman's negligent breach of contract prior to

amortization reduction to present value, the level of retirement and pension funding for State police was deficient in the sum of \$87 million out of a total actuarial asset valuation in the amount of \$1.302 billion for fiscal 2006, or about 7%; for judges, \$25 million out of a total actuarial asset valuation of \$274 million for fiscal 2006, or 9%; and LEOPS, \$16 million out of \$352 million for fiscal 2006, or 5%. The coding error with respect to these three (3) MSRPS pension and retirement systems resulted in material losses not within a range of reasonableness for those three (3) systems even though those systems constitute only a small fraction of the MSRPS gross liability for all MSRPS retirement systems for which its aggregate assets in fiscal 2006 amounted to \$33.293 billion.

For all of the reasons stated above, it is the determination and ruling of the Board that this appeal be and hereby is dismissed with prejudice and the February 14, 2008 final determination of the MSRPS procurement officer holding Milliman in breach of contract and liable for damages be and hereby is affirmed in its entirety except for the following modification that is required for proper quantification of precise damages. As previously expressed in this Decision, the specific claim by MSRPS as set forth in its final agency determination is for \$34.2 million in damages that MSRPS would have received but for Milliman's errors, and \$38.8 million in lost income that MSRPS would have earned on those contributions but for Milliman's errors. Damages proven to the satisfaction of the Board, however, are more precisely itemized as \$34,208,960 in lost contributions plus \$38,756,188 in lost return on that investment. The Board therefore awards to MSRPS not the proven claim in the amount of \$34,208,960, but instead, only \$34,200,000, as set forth in the February 14, 2008 decision that is the subject of the instant appeal. The Board also approves the MSRPS claim for lost income on those contributions, but not for \$38,800,000 as claimed, only for \$38,756,188 as proven, for liability award of

recovery in this matter in favor of respondent MSRPS against appellant Milliman in the total amount of seventy-two million nine hundred and fifty-six thousand one hundred and eighty-eight dollars (\$72,956,188). Respondent's request for pre-decisional interest is denied.

Dated:

Dana Lee Dembrow
Board Member

I Concur:

Michael W. Burns
Chairman

Michael J. Collins
Board Member

Certification

COMAR 21.10.01.02 **Judicial Review.**

A decision of the Appeals Board is subject to judicial review in accordance with the provisions of the Administrative Procedure Act governing cases.

Annotated Code of MD Rule 7-203 **Time for Filing Action.**

(a) Generally. - Except as otherwise provided in this Rule or by statute, a petition for judicial review shall be filed within 30 days after the latest of:

- (1) the date of the order or action of which review is sought;
- (2) the date the administrative agency sent notice of the order or action to the petitioner, if notice was required by law to be sent to the petitioner; or
- (3) the date the petitioner received notice of the agency's order or action, if notice was required by law to be received by the petitioner.

(b) Petition by Other Party. - If one party files a timely petition, any other person may file a petition within 10 days after the date the agency mailed notice of the filing of the first petition, or within the period set forth in section (a), whichever is later.

* * *

I certify that the foregoing is a true copy of the Maryland State Board of Contract Appeals decision in MSBCA 2609, appeal of Milliman, Inc. under MSRPS Contracts for Actuarial Services Dated July 1, 1982, July 1, 1990, July 1, 1993, & August 4, 1998.

Dated:

Michael L. Carnahan
Deputy Clerk