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CORRESPONDENCE MEMORANDUM

DATE: May 5, 2015
TO: Group Insurance Board
FROM: Deb Roemer, Director
Benefit Services Bureau
Division of Retirement Services

SUBJECT: Long-Term Disability Insurance (LTDI) Actuarial Valuation

Staff requests the Group Insurance Board (Board) approve the Long-Term Disability Insurance Actuarial Review as of December 31, 2014.

ETF staff recommends Scenario 1, an increased contribution rate of 0.52% effective January 2016, and then set to 0.35%, effective January 2017 and beyond.

A brief summary is found on page six of the report.

Staff from ETF and Milliman will be at the Board meeting to answer any questions.

Attachment: LTDI Actuarial Valuation

Reviewed and approved by Matt Stohr, Administrator, Division of Retirement Services.

Electronically signed:
5/8/15

Board	Mtg Date	Item #
GIB	5.19.15	4B

**Annual Actuarial Valuation
for
The Long-Term Disability Insurance Plan**

As of December 31, 2014

Prepared by: Daniel D. Skwire, FSA, MAAA
Principal and Consulting Actuary
Milliman, Inc.

Paul L. Correia, FSA, MAAA
Consulting Actuary
Milliman, Inc.

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May 1, 2015

Ms. Deb Roemer
Director of the Benefit Services Bureau
Division of Retirement Services
Wisconsin Department of Employee Trust Funds
Madison, WI 53707

RE: Actuarial Valuation of Long-Term Disability Insurance Plan as of December 31, 2014

Dear Deb:

At your request, we have performed an actuarial valuation of the Long-Term Disability Insurance (LTDI) Plan as of December 31, 2014. Our findings are set forth in this report.

The State of Wisconsin Department of Employee Trust Funds (ETF) has determined that the LTDI Plan is not subject to the provisions of GASB 43 or 45, which govern the financial reporting of Other Post-Employment Benefits (OPEB's), and which require the use of pension accounting methods, including the calculation of a liability for active lives. We have therefore performed this valuation according to the requirements of GASB 10 ("Accounting and Reporting for Risk Financing and Related Insurance Issues"), which does not require the calculation of a liability for active lives. This approach is consistent with prior valuation work performed on the plan. Ultimately it is the responsibility of ETF and its auditors to determine the applicable accounting standards for the plan.

This report is prepared solely for the internal business use of ETF. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

- a) ETF may provide a copy of Milliman's work, in its entirety, to ETF's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit ETF.



- b) ETF may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

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

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by ETF, including historical claims data from Aetna and ETF. While Milliman has not audited this data, we have reviewed it for reasonableness and it is, in our opinion, sufficient and reliable for the purposes of our calculations. If any of this information as summarized in this report is inaccurate or incomplete, the results shown could be materially affected and this report may need to be revised.

The discount rate used for this valuation was prescribed by ETF and is specified in this report. The annual benefit increase rate for the LTDI plan was also specified by ETF. We have performed no independent assessment of the reasonableness of these assumptions. ETF is solely responsible for establishing these assumptions and communicating any changes to Milliman for the purpose of this valuation.

This analysis is only an estimate of the Plan's financial condition as of a single date. It can neither predict the Plan's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of Plan benefits, only the timing of employer contributions. While this report is based on the assumptions documented here, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. ETF has the final decision regarding the appropriateness of the assumptions and actuarial cost methods.

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

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

I, Daniel D. Skwire, FSA, MAAA, am a consulting actuary for Milliman, Inc. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I, Paul L. Correia, FSA, MAAA, am a consulting actuary for Milliman, Inc. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely,



Daniel D. Skwire, FSA, MAAA
Principal and Consulting Actuary
Milliman, Inc.



Paul L. Correia, FSA, MAAA
Consulting Actuary
Milliman, Inc.

Section I: Introduction and Executive Summary

This report contains the 12/31/2014 valuation for the Long-Term Disability Insurance (LTDI) Plan administered by the Wisconsin Department of Employee Trust Funds (ETF).

Summary of Actuarial Liabilities

The actuarial liabilities for the LTDI Plan as of 12/31/2014 are summarized below:

Liability Component	Basic Benefit	Retirement Contribution	Total Liability Amount
Open Claims	\$219,515,743	\$35,182,325	\$254,698,068
IBNR Claims	\$22,813,723	\$3,656,411	\$26,470,134
Loss Adjustment Expense	\$11,247,032	\$0	\$11,247,032
Total	\$253,576,498	\$38,838,736	\$292,415,234

The liability for loss adjustment expenses is included for the first time in the 12/31/2014 valuation. Although this liability was not included in the 12/31/2013 valuation, performed by the plan's prior actuary, it is our view that it is required by the applicable accounting standards.

We have also included a calculation of the liability for retirement contributions for the first time. These contributions are a supplemental benefit provided by the LTDI plan. The supplemental benefit is 7% of final average salary, contributed by WRS into the participant's retirement account. It is unclear why no liability was recognized for these contributions in prior valuations, and ETF may wish to review the accounting for this benefit with its auditors and/or its pension actuaries.

A further discussion of these actuarial liabilities, including a description of methods and assumptions, a comparison to prior year values, and an assessment of the adequacy of the liabilities, is included in the body of this report.

Summary of Funding Analysis

We performed a funding analysis on this plan, involving only the basic benefit and not the supplemental retirement contribution benefit (since the LTDI fund does not include contributions or disbursements related to the supplemental benefit). As shown in the following table, the LTDI plan was in a deficit as of 12/31/2014:

Table 1.2 LTDI Fund Balances: Basic Benefit Only			
	12/31/2012	12/31/2013	12/31/2014
Beginning Balance	\$262,265,728	\$232,381,871	\$215,938,543
Closing Adjustments	(\$4,085,687)	(\$4,854,393)	(\$6,148,059)
Adjusted Beginning Balance	\$258,180,041	\$227,527,478	\$209,790,484
Plus: Premium Contributions	\$0	\$0	\$42,301,135
Plus: Investment Earnings	\$5,130,023	\$22,919,771	\$18,377,826
Less: Insurance Claims	\$28,732,557	\$32,067,487	\$37,052,195
Less: Administrative Expenses	\$2,195,636	\$2,441,219	\$2,351,154
Ending Balance	\$232,381,871	\$215,938,543	\$231,066,095
Actuarial Liability	\$213,067,974	\$233,508,752	\$253,576,498
Surplus / (Deficit)	\$19,313,896	(\$17,570,209)	(\$22,510,403)

According to our financial projections, which are consistent with the plan's valuation assumptions, the plan's deficit is expected to increase if the current premium contribution rate of 0.32% of covered payroll remains unchanged. ETF has indicated, however, that its funding objective for the plan is to eliminate the deficit by 12/31/2017. We have developed two scenarios under which this objective can be achieved, according to our financial projections:

- Scenario 1: The current contribution rate of 0.32% is increased to 0.52% for 2016, and then set to 0.35% for 2017 and beyond.
- Scenario 2: The current contribution rate of 0.32% is increased to 0.43% for 2016 and 2017, and then set to 0.35% for 2018 and beyond.

Scenario 1 is projected to eliminate the deficit by 12/31/2016 and Scenario 2 is projected to eliminate the deficit by 12/31/2017. We believe that either scenario would be a reasonable approach to achieving ETF's funding objectives for this plan.

Section II: Actuarial Valuation

The actuarial liability for the LTDI Plan discussed in this report contains three components:

- **Open Claims:** The expected present value of future benefits payable to members disabled prior to the valuation date whose claims had been reported to ETF on or before that date
- **Incurred but not Reported (IBNR) Claims:** The expected present value of future benefits payable to members disabled prior to the valuation date, but whose claims had not yet been reported to ETF as of that date
- **Loss Adjustment Expenses:** The expected present value of future expenses related to the ongoing management and payment of disability claims

The 12/31/2013 valuation performed by the plan's prior actuary included the first two items, but not the liability for loss adjustment expense. It is our view that the applicable accounting standards explicitly require the calculation of a liability for loss adjustment expenses. Consequently, we have included it in our valuation.

We have also included a calculation of the liability for retirement contributions for the first time. These contributions are a supplemental benefit provided by the LTDI plan. The supplemental benefit is 7% of final average salary, contributed by WRS into the participant's retirement account. It is unclear why no liability was recognized for these contributions in prior valuations, and ETF may wish to review the accounting for this benefit with its auditors and/or its pension actuaries.

The following table compares the 12/31/2013 and 12/31/2014 liabilities for the LTDI plan:

Component	12/31/2013	12/31/2014		
		Basic	Supplemental	Total
Open Claims	\$203,051,089	\$219,515,743	\$35,182,325	\$254,698,068
IBNR Claims	\$30,457,663	\$22,813,723	\$3,656,411	\$26,470,134
Loss Adjustment Expense	N/A	\$11,247,032	\$0	\$11,247,032
Total	\$233,508,752	\$253,576,498	\$38,838,736	\$292,415,234

Appendix C of this letter provides the detailed valuation assumptions used to compute the 12/31/2014 liabilities for the LTDI plan. A comparison of the current and prior liabilities is provided below.

Open Claims

The liability for open claims (considering only basic benefits in order to provide an appropriate comparison with the prior valuation) increased by about 8% due primarily to an increase in the number of open claims, partially offset by the change in the annual benefit increase assumption discussed below. This liability is expected to increase over time as an increasing proportion of members are covered under the LTDI plan rather than the Section 40.63 disability annuity benefit (i.e., the disability benefit within the WRS retirement plan).

There was one change to the valuation assumptions for this liability. This year, annual benefit increases of 2.10% were assumed in the liability calculations, which is the assumption specified by ETF for the annual core annuity adjustment for retirement benefits, which is used to index the LTDI benefits. The prior valuation of this plan assumed annual LTDI benefit increases of 3.20%. The impact of using the lower benefit increase assumption was a reduction of approximately \$15.4 million to the total actuarial liability for this plan.

In order to assess the adequacy of the liability for open claims, we performed a retrospective runoff test to determine whether the liabilities held at prior valuation dates for the basic benefits had been sufficient to cover the emerging costs of LTDI claims. The study used LTDI claims experience from 1/1/2012 through 12/31/2013. The results represent two 12-month studies that were combined: (1) 1/2012 through 12/2012, and (2) 1/2013 through 12/2013. The results are shown in the following table:

Duration at Beginning of Study	Margin %
1 – 12 months	(6.1%)
13 – 24 months	1.0%
25 – 36 months	1.6%
37 – 48 months	1.8%
49 – 60 months	2.8%
61 + months	5.3%
Total	2.2%

In the preceding table, a positive margin indicates the liability was adequate to cover the runoff of open disability claims during the study period, while a negative margin indicates a deficiency. The cost of the claim runoff is computed as the present value of paid claims during the study period, plus the present value of the liability for these claims at the end of the study period. For this type of plan, we typically target a positive overall margin of 1% to 5%, with reasonably consistent patterns by claim duration. The preceding table indicates that the LTDI plan meets that objective, albeit with a negative margin for the first year of disability. Since volatility is common from year to year, we did not feel this one

negative amount justified a change in valuation assumptions for this plan, but we will monitor it in the future to determine if this is a recurring pattern.

IBNR Claims

The liability for IBNR claims, again focusing only on basic benefits in order to compare with the prior valuation, decreased by about 25% due to a change in valuation methodology. In the prior valuation, the IBNR liability was computed as a percentage of the plan's open claim reserve, which we do not feel is the best index, since the IBNR liability relates to annual claim activity while the open claim liability reflects the cumulative liability from all prior plan years.

The liability for IBNR claims reflects the expected portion of the total cost of claims incurred in a given year that is attributable to those claims that had not been reported as of the end of the year. If, on average, claims are reported 6 months after the date of disability, then the IBNR liability would likely be approximately 50% of the expected total cost of new claims for the year. We therefore computed the IBNR liability by estimating the total cost of incurred claims for 2014 (based on recent trends) and by using historical claim data to determine the proportion of claims that were typically unreported at each year end.

Our IBNR calculation for the LTDI plan is summarized below:

Estimated Incurred Claims	\$41,479,496
Estimated Proportion of Unreported Claims	55.0%
IBNR Liability as of 12/31/2014	\$22,813,723

The IBNR liability for supplemental retirement contribution benefits was developed using the same ratio of IBNR to open claim liabilities as for basic benefits.

Loss Adjustment Expense

The liability for loss adjustment expenses was computed by comparing the annual fees payable to Aetna, which are estimated to be \$3,402,338 in 2015, to the expected annual incurred claims amount (including only basic benefits from the LTDI plan) for all three plans combined. The fees as a percentage of expected annual incurred claims for the LTDI and Income Continuation Insurance (ICI) plans combined are approximately 4.6%. The loss adjustment expense liability was then calculated as 4.5% of the open claim liability and 6.0% of the IBNR liability. The factor is lower for open claims than for IBNR claims because the expenses related to initial claim investigation have already been incurred and do not need to be included in the liability.

Our loss adjustment expense calculation for the LTDI plan is summarized below:

Component	Liability	Expense Factor	Loss Adjustment Expenses
Open Claims	\$219,515,743	4.5%	\$9,878,208
IBNR	\$22,813,723	6.0%	\$1,368,823
Total	\$242,329,466	4.6%	\$11,247,032

No separate loss adjustment expense liability is held for supplemental retirement contribution benefits because no additional expenses are incurred beyond what is needed to adjudicate the basic benefits.

Section III: Discussion of LTDI Funding Levels

We performed a funding analysis on the LTDI plan, involving only the basic benefit and not the supplemental retirement contribution benefit (since the LTDI fund does not include contributions or disbursements related to the supplemental benefit). The following table shows the fund balances as of the three most recent fiscal year-ends (the 2012 and 2013 values were taken from prior valuation reports).

	12/31/2012	12/31/2013	12/31/2014
Beginning Balance	\$262,265,728	\$232,381,871	\$215,938,543
Closing Adjustments	(\$4,085,687)	(\$4,854,393)	(\$6,148,059)
Adjusted Beginning Balance	\$258,180,041	\$227,527,478	\$209,790,484
Plus: Premium Contributions	\$0	\$0	\$42,301,135
Plus: Investment Earnings	\$5,130,023	\$22,919,771	\$18,377,826
Less: Insurance Claims	\$28,732,557	\$32,067,487	\$37,052,195
Less: Administrative Expenses	\$2,195,636	\$2,441,219	\$2,351,154
Ending Balance	\$232,381,871	\$215,938,543	\$231,066,095
Actuarial Liability	\$213,067,974	\$233,508,752	\$253,576,498
Surplus / (Deficit)	\$19,313,896	(\$17,570,209)	(\$22,510,403)

Despite the commencement of premium contributions in 2014, the LTDI plan remained in a deficit as of 12/31/2014. ETF has indicated that its funding objective for this plan is to eliminate the deficit within three years (i.e., by 12/31/2017). In order to determine the premium change necessary to accomplish this objective, we prepared a financial projection for the LTDI plan. The projection reflects actual results for 2014 and projected values in 2015 and beyond. The key elements of this projection included the following:

- **Beginning Balance:** The projected beginning balance for each year is equal to the prior year's ending balance.
- **Covered Payroll:** The current covered payroll was provided to us by ETF. Future covered payroll is assumed to increase 3.20% per year, which is consistent with the assumptions used by ETF for retirement fund projections.
- **Premium Contributions:** Premiums are modeled as a percentage of covered payroll. The rate for 2014 and 2015 is 0.32% based on recent experience.
- **Investment Income:** Investment income is projected using the valuation assumption of 7.2%.
- **Insurance Claims:** Annual paid insurance claims are the sum of projected payments on existing claims as of 12/31/2014, and of payments on expected future claims incurred after 12/31/2014. Future incurred claims are based on historical

experience of 0.31% of covered payroll in 2014, adjusted for expected aging in subsequent years.

- **Administrative Expenses:** Administrative expenses are modeled as a constant percentage of paid insurance claims, based on actual values in 2014.
- **Ending Balance:** The projecting ending balance equals the starting balance, plus premiums, plus investment earnings, less claims, and less expenses.
- **Actuarial Liability:** The actuarial liability is modeled in a similar fashion to the insurance claims. It represents the sum of the decreasing liability on claims that existed as of 12/31/2014, and of the increasing liability for claims incurred after 12/31/2014.
- **Surplus or Deficit:** The projected surplus or deficit equals the ending balance less the actuarial liability.

The current contribution rate of 0.32% of covered payroll for the LTDI plan falls slightly short of the expected annual cost of new disability claims and related administrative expenses. This fact, coupled with the fact that the plan was in a deficit as of 12/31/2014, means that if future contributions remain at the current level, the deficit is expected to increase each year.

ETF has indicated that its objective is to eliminate the deficit by 12/31/2017 and to manage the fund in a manner to maintain positive fund balances thereafter. This objective can be achieved through increased contributions from WRS into the LTDI fund. We have modeled two scenarios that achieve that objective. Both involve significantly higher contributions in the near term to address the existing deficit, followed by a long-term contribution rate that is aligned with the plan's future expected benefits and expenses.

- **Scenario 1:** The current contribution rate of 0.32% is increased to 0.52% for 2016, and then set to 0.35% for 2017 and beyond.
- **Scenario 2:** The current contribution rate of 0.32% is increased to 0.43% for 2016 and 2017, and then set to 0.35% for 2018 and beyond.

Scenario 1 is projected to eliminate the deficit by 12/31/2016 and Scenario 2 is projected to eliminate the deficit by 12/31/2017. We believe that either scenario would be a reasonable approach to achieving ETF's funding objectives for this plan. The detailed output from our baseline (no change) scenario and Scenarios 1 and 2 is provided on the following pages. Please note that these projections depend on a variety of actuarial assumptions about future experience, including but not limited to investment earnings, payroll growth, and disability claim experience. It is nearly certain that actual experience will vary from

these assumptions, meaning that the plan's actual surplus or deficit will be higher or lower than the illustrated values.

LTDI Fund Balance Analysis as of December 31, 2014

Baseline: Current Contribution Rate

Calendar Year	2014	2015	2016	2017	2018	2019	2020
BOY Fund Balance	209,790,484	231,066,095	250,647,219	268,775,915	285,601,026	301,100,964	315,201,095
Premium Contributions	42,301,135	43,654,771	45,051,724	46,493,379	47,981,167	49,516,564	51,101,094
Investment Income	18,377,826	16,636,759	18,046,600	19,351,866	20,563,274	21,679,269	22,694,479
Total Revenues	60,678,960	60,291,530	63,098,323	65,845,245	68,544,441	71,195,834	73,795,573
Insurance Claims	37,052,195	38,281,262	42,286,340	46,095,157	49,879,396	53,688,866	57,444,542
Carrier Administrative Expenses	1,941,700	2,006,108	2,215,992	2,415,591	2,613,902	2,813,535	3,010,349
Administrative Expense	409,454	423,036	467,295	509,385	551,204	593,301	634,804
Total Operating Expenses	39,403,349	40,710,407	44,969,627	49,020,134	53,044,502	57,095,703	61,089,696
Net Change in Fund Balance	21,275,611	19,581,123	18,128,696	16,825,111	15,499,938	14,100,131	12,705,878
EOY Fund Balance	231,066,095	250,647,219	268,775,915	285,601,026	301,100,964	315,201,095	327,906,972
Incurred Claim Liability	253,576,498	275,676,001	296,891,328	317,379,805	337,210,175	356,494,962	375,338,206
Surplus / (Deficit)	(22,510,403)	(25,028,783)	(28,115,413)	(31,778,779)	(36,109,211)	(41,293,867)	(47,431,233)



This work product was prepared solely for Wisconsin ETF. It may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work.

LTDI Fund Balance Analysis as of December 31, 2014

Scenario 1: Increase contribution rate to 0.52% in 2016, then 0.35% in 2017 and beyond

Calendar Year	2014	2015	2016	2017	2018	2019	2020
BOY Fund Balance	209,790,484	231,066,095	250,647,219	296,933,242	320,144,435	342,629,733	364,362,113
Premium Contributions	42,301,135	43,654,771	73,209,051	50,852,133	52,479,401	54,158,742	55,891,822
Investment Income	18,377,826	16,636,759	18,046,600	21,379,193	23,050,399	24,669,341	26,234,072
Total Revenues	60,678,960	60,291,530	91,255,651	72,231,326	75,529,801	78,828,083	82,125,894
Insurance Claims	37,052,195	38,281,262	42,286,340	46,095,157	49,879,396	53,688,866	57,444,542
Carrier Administrative Expenses	1,941,700	2,006,108	2,215,992	2,415,591	2,613,902	2,813,535	3,010,349
Administrative Expense	409,454	423,036	467,295	509,385	551,204	593,301	634,804
Total Operating Expenses	39,403,349	40,710,407	44,969,627	49,020,134	53,044,502	57,095,703	61,089,696
Net Change in Fund Balance	21,275,611	19,581,123	46,286,023	23,211,193	22,485,298	21,732,380	21,036,198
EOY Fund Balance	231,066,095	250,647,219	296,933,242	320,144,435	342,629,733	364,362,113	385,398,312
Incurred Claim Liability	253,576,498	275,676,001	296,891,328	317,379,805	337,210,175	356,494,962	375,338,206
Surplus / (Deficit)	(22,510,403)	(25,028,783)	41,914	2,764,630	5,419,558	7,867,151	10,060,106

LTDI Fund Balance Analysis as of December 31, 2014

Scenario 2: Increase contribution rate to 0.43% in 2016 and 2017, then 0.35% in 2018 and beyond

Calendar Year	2014	2015	2016	2017	2018	2019	2020
BOY Fund Balance	209,790,484	231,066,095	250,647,219	284,262,445	318,184,685	340,528,881	362,110,000
Premium Contributions	42,301,135	43,654,771	60,538,254	62,475,478	52,479,401	54,158,742	55,891,822
Investment Income	18,377,826	16,636,759	18,046,600	20,466,896	22,909,297	24,518,079	26,071,920
Total Revenues	60,678,960	60,291,530	78,584,853	82,942,374	75,388,699	78,676,821	81,963,742
Insurance Claims	37,052,195	38,281,262	42,286,340	46,095,157	49,879,396	53,688,866	57,444,542
Carrier Administrative Expenses	1,941,700	2,006,108	2,215,992	2,415,591	2,613,902	2,813,535	3,010,349
Administrative Expense	409,454	423,036	467,295	509,385	551,204	593,301	634,804
Total Operating Expenses	39,403,349	40,710,407	44,969,627	49,020,134	53,044,502	57,095,703	61,089,696
Net Change in Fund Balance	21,275,611	19,581,123	33,615,226	33,922,240	22,344,196	21,581,119	20,874,046
EOY Fund Balance	231,066,095	250,647,219	284,262,445	318,184,685	340,528,881	362,110,000	382,984,046
Incurred Claim Liability	253,576,498	275,676,001	296,891,328	317,379,805	337,210,175	356,494,962	375,338,206
Surplus / (Deficit)	(22,510,403)	(25,028,783)	(12,628,883)	804,880	3,318,706	5,615,038	7,645,841

Appendix A: Plan Description

The LTDI Plan provides long-term disability benefits as summarized below. This is a high-level plan summary intended to provide a context for understanding the valuation analysis. It is not a comprehensive plan description:

- **Elimination Period:** The elimination period is the end of accumulated sick leave time, or after the participant converts unused sick leave to pay for group health insurance premiums. If the sick leave is converted, the LTDI benefit will begin sooner.
- **Maximum Benefit Period:** The following table shows the maximum duration of benefits:

Age on Benefit Effective Date	Maximum Benefit Period
Before Age 61	End of the month in which you reach age 65
Age 61 or 62	End of the month in which you reach age 66
Age 63 or 64	End of the month in which you reach age 67
Age 65 or 66	End of the month in which you reach age 68
Age 67	End of the month in which you reach age 69
Age 68	End of the month in which you reach age 70
Age 69 and Older	12 months after LTDI benefit effective date

- **Benefit Amount:** The amount of the benefit is 40% or 50% of the participant's average salary based on his or her three highest years of earnings. The benefit is 50% of the participant's average salary if he or she is not eligible for Social Security benefits. Otherwise, the benefit is 40% of the average salary.
- **Supplemental Retirement Contribution Benefit:** An additional 7% of final average salary is contributed to the participant's WRS retirement account.
- **Benefit Increases:** The basic benefit amount is adjusted every year by the same Core Fund dividend percentage as monthly retirement annuities.
- **Benefit Offsets:** The LTDI plan benefit is offset by WRS retirement benefits. It is not offset for Social Security benefits or other sources.
- **Definition of Disability:** A participant is disabled if he or she is unable to engage in any substantial gainful activity by reason of a medically determinable impairment, whether physical or mental, which can reasonably be expected to result in death or to be permanent or of long-continued and indefinite duration.

Appendix B: Data for Valuation

Number of Active LTDI Claims by Year of Disability as of December 31, 2014

<u>Year of Disability</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
2001 and earlier	31	78	109
2002	11	31	42
2003	18	39	57
2004	22	40	62
2005	27	76	103
2006	31	91	122
2007	45	86	131
2008	49	97	146
2009	54	109	163
2010	70	138	208
2011	90	173	263
2012	112	213	325
2013	110	209	319
<u>2014</u>	<u>66</u>	<u>91</u>	<u>157</u>
Total	736	1,471	2,207

Total Net Monthly Benefit by Year of Disability as of December 31, 2014

<u>Year of Disability</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
2001 and earlier	34,697	81,554	116,250
2002	11,676	32,558	44,234
2003	19,787	40,273	60,060
2004	25,039	40,720	65,759
2005	32,573	79,034	111,607
2006	38,114	107,000	145,114
2007	66,496	103,069	169,565
2008	66,715	116,835	183,550
2009	82,797	147,651	230,447
2010	96,240	187,617	283,857
2011	129,982	231,499	361,480
2012	171,733	294,758	466,492
2013	170,794	305,494	476,288
<u>2014</u>	<u>103,487</u>	<u>129,874</u>	<u>233,361</u>
Total	1,050,130	1,897,935	2,948,065

**Number of Active LTDI Claims by Age at Disability
as of December 31, 2014**

<u>Age at Disability</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
< 20	-	-	-
20-24	2	1	3
25-29	10	17	27
30-34	16	60	76
35-39	42	126	168
40-44	89	203	292
45-49	128	266	394
50-54	187	371	558
55-59	173	308	481
60-64	87	111	198
<u>65+</u>	<u>2</u>	<u>8</u>	<u>10</u>
Total	736	1,471	2,207

**Total Net Monthly Benefit by Age at Disability
as of December 31, 2014**

<u>Age at Disability</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
< 20	-	-	-
20-24	1,778	843	2,621
25-29	11,727	20,148	31,875
30-34	18,929	73,099	92,029
35-39	54,504	150,968	205,472
40-44	137,163	261,026	398,189
45-49	186,890	341,413	528,302
50-54	274,263	493,688	767,950
55-59	252,547	420,703	673,250
60-64	110,877	131,339	242,216
<u>65+</u>	<u>1,452</u>	<u>4,708</u>	<u>6,160</u>
Total	1,050,130	1,897,935	2,948,065

Appendix C: Actuarial Methods and Assumptions

- Valuation Date: 12/31/2014
- Discount Rate: 7.20%, specified by ETF
- Annual Benefit Increases: 2.10%, specified by ETF and equal to the core annuity adjustment assumption for the WRS retirement plan.
- Claim Termination Rates: Claim termination rate assumptions were derived from the 1987 Commissioner's Group Disability Table (CGDT). The CGDT rates were multiplied by a factor of 0.60 for the first 24 months of disability, and by a factor of 0.70 for all subsequent months.
- Incurred But Not Reported Claims: 55% of the estimated incurred claims for the current year, as determined from analyses of historical LTDI claims experience.
- Loss Adjustment Expenses: 4.5% of the liability for open claims plus 6.0% of the liability for IBNR claims.

Appendix D: Reliance Items

In performing the valuation, we relied, without audit, on certain data and information provided by ETF and Aetna. To the extent any of the data or other items was incomplete or inaccurate, the results of our work may be materially affected.

The principal items on which we relied included the following:

- Lists of active disability claims and related information provided by Aetna
- Asset balances, premium contributions, plan expenses, covered payroll, and other financial information provided by ETF
- Plan descriptions provided by ETF
- Discussions with ETF and Aetna personnel