



LIFE AND ACCIDENT AND HEALTH COMPANIES/FRATERNAL BENEFIT SOCIETIES - ASSOCIATION EDITION - SEPARATE ACCOUNTS

# ANNUAL STATEMENT

FOR THE YEAR ENDED DECEMBER 31, 2023

OF THE CONDITION AND AFFAIRS OF THE SEPARATE ACCOUNTS OF THE

## Massachusetts Mutual Life Insurance Company

NAIC Group Code 0435 0435 NAIC Company Code 65935 Employer's ID Number 04-1590850  
(Current) (Prior)

Organized under the Laws of Massachusetts, State of Domicile or Port of Entry MA

Country of Domicile United States of America

Type of Separate Accounts Insulated [ X ] Non-Insulated [ ]

Incorporated/Organized 05/15/1851 Commenced Business 08/01/1851

Statutory Home Office 1295 State Street, Springfield, MA, US 01111  
(Street and Number) (City or Town, State, Country and Zip Code)

Main Administrative Office 1295 State Street  
(Street and Number) Springfield, MA, US 01111  
(City or Town, State, Country and Zip Code) 413-788-8411  
(Area Code) (Telephone Number)

Mail Address 1295 State Street, Springfield, MA, US 01111  
(Street and Number or P.O. Box) (City or Town, State, Country and Zip Code)

Primary Location of Books and Records 1295 State Street  
(Street and Number) Springfield, MA, US 01111  
(City or Town, State, Country and Zip Code) 413-788-8411  
(Area Code) (Telephone Number)

Internet Website Address www.massmutual.com

Statutory Statement Contact Yin Wang, 617-695-4071  
(Name) (Area Code) (Telephone Number)  
YWang67@massmutual.com, 413-226-4086  
(E-mail Address) (FAX Number)

### OFFICERS

President and Chief Executive Officer Roger William Crandall Treasurer Julieta Giselle Sinisgalli  
Secretary Akintokunbo Akinbajo Appointed Actuary Vy Quoc Ho

### OTHER

Elizabeth Ward Chicares, Chief Financial Officer Eric William Partlan #, Chief Investment Officer Geoffrey James Craddock, Chief Risk Officer  
Susan Marie Cicco, Head of Human Resources & Employee Experience Michael James O'Connor, General Counsel Sears Andrew Merritt, Head of Enterprise Technology & Experience  
Dominic Lusean Blue #, Head of Third Party Distribution and New Markets Paul Anthony LaPiana #, Head of Brand, Product and Affiliated Distribution Peter John Rugel #, Head of Operations

### DIRECTORS OR TRUSTEES

Roger William Crandall - Chairman Mark Thomas Bertolini Kathleen Ann Corbet  
James Henry DeGraffenreidt, Jr. Isabella Davidov Goren Jeffrey Marc Leiden  
Laura Jeanne Sen William Taylor Spitz - Lead Director Howard Todd Stitzer  
Michelle Kwok Lee Bernard Anthony Harris, Jr.

State of Massachusetts SS  
County of Hampden

The officers of this reporting entity being duly sworn, each depose and say that they are the described officers of said reporting entity, and that on the reporting period stated above, all of the herein described assets were the absolute property of the said reporting entity, free and clear from any liens or claims thereon, except as herein stated, and that this statement, together with related exhibits, schedules and explanations therein contained, annexed or referred to, is a full and true statement of all the assets and liabilities and of the condition and affairs of the said reporting entity as of the reporting period stated above, and of its income and deductions therefrom for the period ended, and have been completed in accordance with the NAIC Annual Statement Instructions and Accounting Practices and Procedures manual except to the extent that: (1) state law may differ; or, (2) that state rules or regulations require differences in reporting not related to accounting practices and procedures, according to the best of their information, knowledge and belief, respectively. Furthermore, the scope of this attestation by the described officers also includes the related corresponding electronic filing with the NAIC, when required, that is an exact copy (except for formatting differences due to electronic filing) of the enclosed statement. The electronic filing may be requested by various regulators in lieu of or in addition to the enclosed statement.

Roger William Crandall  
President and Chief Executive Officer

Akintokunbo Akinbajo  
Secretary

Julieta Giselle Sinisgalli  
Treasurer

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_

- a. Is this an original filing? ..... Yes [ X ] No [ ]  
b. If no,  
1. State the amendment number.....  
2. Date filed .....  
3. Number of pages attached.....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**ASSETS**

	Current Year			Prior Year
	1 General Account Basis	2 Fair Value Basis	3 Total (Cols. 1 + 2)	4 Total
1. Bonds (Schedule D).....		14,779,831,384	14,779,831,384	15,717,012,653
2. Stocks (Schedule D):				
2.1 Preferred stocks .....		4,212,864	4,212,864	4,500,336
2.2 Common stocks .....		34,820,864,351	34,820,864,351	34,832,112,984
3. Mortgage loans on real estate (Schedule B) .....				
4. Real estate (Schedule A):				
4.1 Properties held for the production of income (less \$ ..... encumbrances) .....				
4.2 Properties held for sale (less \$ ..... encumbrances) .....				
5. Cash (\$ ..... 50,290,926 Schedule E - Part 1), and cash equivalents (\$ ..... 530,143,492 , Schedule E - Part 2) .....		580,434,418	580,434,418	747,792,968
6. Short-term investments (Schedule DA) .....		196,551,422	196,551,422	45,729,103
7. Derivatives (Schedule DB) .....		156,510,072	156,510,072	203,976,103
8. Other invested assets (Schedule BA) .....		1,867,411,282	1,867,411,282	1,652,403,929
9. Securities lending reinvested collateral assets (Schedule DL) .....				
10. Aggregate write-ins for invested assets .....				
11. Subtotals, cash and invested assets (Lines 1 to 10) .....		52,405,815,793	52,405,815,793	53,203,528,076
12. Investment income due and accrued .....		117,941,343	117,941,343	123,864,825
13. Receivables for securities .....		68,875,105	68,875,105	83,952,948
14. Net adjustment in assets and liabilities due to foreign exchange rates .....		37	37	13
15. Aggregate write-ins for other than invested assets.....				2,458,796
16. Total (Lines 11 to 15)		52,592,632,278	52,592,632,278	53,413,804,658
<b>DETAILS OF WRITE-INS</b>				
1001. ....				
1002. ....				
1003. ....				
1098. Summary of remaining write-ins for Line 10 from overflow page .....				
1099. Totals (Lines 1001 thru 1003 plus 1098)(Line 10 above)				
1501. Miscellaneous .....				2,458,796
1502. ....				
1503. ....				
1598. Summary of remaining write-ins for Line 15 from overflow page .....				
1599. Totals (Lines 1501 thru 1503 plus 1598)(Line 15 above)				2,458,796

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**LIABILITIES AND SURPLUS**

	Current Year			Prior Year
	1 General Account Basis	2 Fair Value Basis	3 Total (Cols. 1 + 2)	4 Total
1. Aggregate reserve for life, annuity and accident and health contracts (Exhibit 3, Line 9999999, Col. 2) .....		42,947,620,591	42,947,620,591	43,509,137,894
2. Liability for deposit-type contracts (Exhibit 4, Line 9, Col. 1) .....		9,332,121,016	9,332,121,016	9,431,864,216
3. Interest Maintenance Reserve .....				
4. Charges for investment management, administration and contract guarantees due or accrued .....		5,981,017	5,981,017	7,044,404
5. Investment expenses due or accrued (Exhibit 1, Line 24) .....		91,984	91,984	47,299
6. Investment taxes, licenses and fees due or accrued, excluding federal income taxes (Exhibit 2, Line 8) .....				
7. Federal and foreign income taxes due or accrued (excluding deferred taxes) .....				
8. Reserve for future federal income taxes .....				
9. Unearned investment income .....				
10. Other transfers to general account due or accrued (net) (including \$ ..... 58,696,738 accrued expense allowances recognized in reserves).....		59,784,331	59,784,331	62,653,062
11. Remittances and items not allocated .....		27,477,031	27,477,031	175,685,535
12. Derivatives .....		27,231,082	27,231,082	7,566,123
13. Payable for securities .....		45,454,094	45,454,094	90,657,584
14. Payable for securities lending .....				
15. Net adjustment in assets and liabilities due to foreign exchange rates .....				
16. Aggregate write-ins for liabilities .....		8,957,750	8,957,750	(1,149,592)
17. Total liabilities (including \$ ..... 65,765,348 due or accrued net transfers to or (from) the general account) .....		52,454,718,896	52,454,718,896	53,283,506,525
18. Contributed surplus .....				3
19. Aggregate write-ins for special surplus funds .....				
20. Unassigned funds .....		137,913,382	137,913,382	130,298,130
21. Surplus (Lines 18 through 20) .....		137,913,382	137,913,382	130,298,133
22. Totals		52,592,632,278	52,592,632,278	53,413,804,658
<b>DETAILS OF WRITE-INS</b>				
1601. Reverse repurchase agreements .....		7,000,801	7,000,801	
1602. Derivatives accrued interest on swaps .....		1,110,433	1,110,433	(1,899,450)
1603. Annuitant mortality fluctuation fund .....		1,044,318	1,044,318	902,597
1698. Summary of remaining write-ins for Line 16 from overflow page .....		(197,802)	(197,802)	(152,739)
1699. Totals (Lines 1601 thru 1603 plus 1698)(Line 16 above)		8,957,750	8,957,750	(1,149,592)
1901. ....				
1902. ....				
1903. ....				
1998. Summary of remaining write-ins for Line 19 from overflow page .....				
1999. Totals (Lines 1901 thru 1903 plus 1998)(Line 19 above)				

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**SUMMARY OF OPERATIONS**

	1 Current Year	2 Prior Year
1. Transfers to Separate Accounts:		
1.1 Net premiums and annuity considerations for life and accident and health contracts .....	3,507,809,319	6,143,970,368
1.2 Considerations for supplementary contracts with life contingencies .....		
1.3 Aggregate write-ins for other transfers to Separate Accounts .....		
1.4 Totals (Lines 1.1 to 1.3) .....	3,507,809,319	6,143,970,368
2. Transfers on account of deposit-type contracts (including \$ ..... 1,233,962,837 deposits less \$ ..... 2,806,531,426 withdrawals) .....	(1,572,568,589)	(1,938,661,414)
3. Net investment income and capital gains and losses .....	7,140,320,377	(11,948,714,050)
4. Aggregate write-ins for other income .....	30,495,747	189,178
5. Totals (Lines 1.4 to 4) .....	9,106,056,854	(7,743,215,918)
<b>DEDUCT:</b>		
6. Transfers from the Separate Account on account of contract benefits:		
6.1 Death benefits .....	15,535,480	12,058,815
6.2 Matured endowments .....		
6.3 Annuity benefits .....	287,005,759	167,720,289
6.4 Payments on supplementary contracts with life contingencies .....		
6.5 Accident and health benefits .....		
6.6 Surrender benefits and withdrawals for life contracts .....	9,130,858,621	14,842,597,289
6.7 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits .....		
7. Transfers on account of policy loans .....	23,708,710	19,210,134
8. Net transfer of reserves from or (to) Separate Accounts .....	(66,769,049)	(792,160,576)
9. Other transfers from the Separate Accounts:		
9.1 Federal and foreign income taxes incurred .....		
9.2 Change in expense allowances recognized in reserves .....	(3,687,310)	(29,862,702)
9.3 Aggregate write-ins for other transfers from Separate Accounts .....	67,664	23,295,139
10. Subtotals (Lines 6.1 to 9.3) .....	9,386,719,875	14,242,858,388
11. Fees associated with charges for investment management, administration and contract guarantees .....	372,885,575	366,848,837
12. Increase in aggregate reserve for life and accident and health contracts .....	(561,517,303)	(18,096,011,521)
13. Increase in liability for deposit-type contracts .....	(99,743,200)	(4,239,623,811)
14. Increase in reserve for future federal income taxes .....		
15. Aggregate write-ins for reserves and funds .....	96,658	(112,521)
16. Totals (Lines 10 to 15) .....	9,098,441,605	(7,726,040,628)
17. Net gain from operations (including \$ ..... (4,600,052) unrealized capital gains) (Line 5 minus Line 16) .....	7,615,249	(17,175,290)
<b>SURPLUS ACCOUNT</b>		
18. Surplus, December 31, prior year .....	130,298,133	147,473,420
19. Net gain from operations (Line 17) .....	7,615,249	(17,175,290)
20. Surplus contributed or (withdrawn) during year .....		3
21. Change in reserve on account of change in valuation basis, (increase) or decrease .....		
22. Transfer from Separate Accounts of the change in expense allowances recognized in Line 21 .....		
23. Aggregate write-ins for gains and losses in surplus .....		
24. Surplus, December 31, current year (Page 3, Line 21) .....	137,913,382	130,298,133
<b>DETAILS OF WRITE-INS</b>		
01.301. ....		
01.302. ....		
01.303. ....		
01.398. Summary of remaining write-ins for Line 1.3 from overflow page .....		
01.399. Totals (Lines 01.301 thru 01.303 plus 01.398)(Line 1.3 above) .....		
0401. Miscellaneous .....	30,495,747	189,178
0402. ....		
0403. ....		
0498. Summary of remaining write-ins for Line 4 from overflow page .....		
0499. Totals (Lines 0401 thru 0403 plus 0498)(Line 4 above) .....	30,495,747	189,178
06.701. ....		
06.702. ....		
06.703. ....		
06.798. Summary of remaining write-ins for Line 6.7 from overflow page .....		
06.799. Totals (Lines 06.701 thru 06.703 plus 06.798)(Line 6.7 above) .....		
09.301. Miscellaneous .....	67,664	23,295,139
09.302. ....		
09.303. ....		
09.398. Summary of remaining write-ins for Line 9.3 from overflow page .....		
09.399. Totals (Lines 09.301 thru 09.303 plus 09.398)(Line 9.3 above) .....	67,664	23,295,139
1501. Change in annuitant mortality fluctuation fund .....	141,721	(144,076)
1502. Claims in course of settlement .....	(45,063)	(88,100)
1503. Miscellaneous .....		119,655
1598. Summary of remaining write-ins for Line 15 from overflow page .....		
1599. Totals (Lines 1501 thru 1503 plus 1598)(Line 15 above) .....	96,658	(112,521)
2301. ....		
2302. ....		
2303. ....		
2398. Summary of remaining write-ins for Line 23 from overflow page .....		
2399. Totals (Lines 2301 thru 2303 plus 2398)(Line 23 above) .....		

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company  
**ANALYSIS OF OPERATIONS BY LINES OF BUSINESS - SUMMARY**

	1	2	3	4	5	6	7
	Total	Individual Life	Group Life	Individual Annuities	Group Annuities	Accident and Health	Other Lines of Business
1. Transfers to Separate Accounts:							
1.1 Net premiums and annuity considerations for life and accident and health contracts	3,507,809,319	66,413,660	43,539,931	153,524,517	3,244,331,211		
1.2 Considerations for supplementary contracts with life contingencies		XXX	XXX			XXX	
1.3 Aggregate write-ins for other transfers to Separate Accounts							
1.4 Totals (Lines 1.1 to 1.3)	3,507,809,319	66,413,660	43,539,931	153,524,517	3,244,331,211		
2. Transfers on account of deposit-type contracts (including \$ 1,233,962,837 deposits less \$ 2,806,531,426 withdrawals)	(1,572,568,589)				(1,572,568,589)		
3. Net investment income and capital gains and losses	7,140,320,377	249,874,680	32,122,719	1,250,990,704	5,607,332,274		
4. Aggregate write-ins for other income	30,495,747			273	30,495,474		
5. Totals (Lines 1.4 to 4)	9,106,056,854	316,288,340	75,662,650	1,404,515,494	7,309,590,370		
DEDUCT:							
6. Transfers from the Separate Account on account of contract benefits:							
6.1 Death benefits	15,535,480	7,648,117	7,887,363			XXX	
6.2 Matured endowments						XXX	
6.3 Annuity benefits	287,005,759	XXX	XXX	165,469,117	121,536,642	XXX	
6.4 Payments on supplementary contracts with life contingencies		XXX	XXX			XXX	
6.5 Accident and health benefits		XXX	XXX	XXX	XXX		
6.6 Surrender benefits and withdrawals for life contracts	9,130,858,621	42,661,074	8,774,241	996,183,810	8,083,239,496	XXX	
6.7 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits							
7. Transfers on account of policy loans	23,708,710	23,448,240	(708,198)	(58,284)	1,026,952	XXX	
8. Net transfer of reserves from or (to) Separate Accounts	(66,769,049)	(8,731,713)	(92,621)	3,134,453	(61,079,168)		
9. Other transfers from the Separate Accounts:							
9.1 Federal and foreign income taxes incurred						XXX	
9.2 Change in expense allowances recognized in reserves	(3,687,310)	3,151,201		(6,838,511)		XXX	
9.3 Aggregate write-ins for other transfers from Separate Accounts	67,664	2,067	8,402	57,195			
10. Subtotals (Lines 6.1 to 9.3)	9,386,719,875	68,178,986	15,869,187	1,157,947,780	8,144,723,922		
11. Fees associated with charges for investment management, administration and contract guarantees	372,885,575	50,612,819	21,159,430	139,894,636	161,218,690		
12. Increase in aggregate reserve for life and accident and health contracts	(561,517,303)	197,541,598	38,634,033	106,494,187	(904,187,121)		
13. Increase in liability for deposit-type contracts	(99,743,200)			37,170	(99,780,370)	XXX	
14. Increase in reserve for future federal income taxes							
15. Aggregate write-ins for reserves and funds	96,658	(45,063)		141,721			
16. Totals (Lines 10 to 15)	9,098,441,605	316,288,340	75,662,650	1,404,515,494	7,301,975,121		
17. Net gain from operations (including \$ (4,600,052) unrealized capital gains) (Line 5 minus Line 16)	7,615,249				7,615,249		
18. Policies/certificates in force end of year	576,367	23,661	6,784	89,798	456,124		
<b>DETAILS OF WRITE-INS</b>							
01.301. Miscellaneous							
01.302. ....							
01.303. ....							
01.398. Summary of remaining write-ins for Line 1.3 from overflow page							
01.399. Totals (Lines 01.301 thru 01.303 plus 01.398) (Line 1.3 above)							
0401. Miscellaneous	30,495,747			273	30,495,474		
0402. ....							
0403. ....							
0498. Summary of remaining write-ins for Line 4 from overflow page							
0499. Totals (Lines 0401 thru 0403 plus 0498) (Line 4 above)	30,495,747			273	30,495,474		
06.701. ....							
06.702. ....							
06.703. ....							
06.798. Summary of remaining write-ins for Line 6.7 from overflow page							
06.799. Totals (Lines 06.701 thru 06.703 plus 06.798) (Line 6.7 above)							
09.301. Miscellaneous	67,664	2,067	8,402	57,195			
09.302. ....							
09.303. ....							
09.398. Summary of remaining write-ins for Line 9.3 from overflow page							
09.399. Totals (Lines 09.301 thru 09.303 plus 09.398) (Line 9.3 above)	67,664	2,067	8,402	57,195			
1501. Change in annuitant mortality fluctuation fund	141,721			141,721			
1502. Claims in course of settlement	(45,063)	(45,063)					
1503. ....							
1598. Summary of remaining write-ins for Line 15 from overflow page							
1599. Totals (Lines 1501 thru 1503 plus 1598) (Line 15 above)	96,658	(45,063)		141,721			

**ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company**  
**ANALYSIS OF OPERATIONS BY LINES OF BUSINESS - INDIVIDUAL LIFE INSURANCE (b)**

	1	2	3	4	5	6	7	8	9	10	11
	Total	Industrial Life	Whole Life	Term Life	Indexed Life	Universal Life	Universal Life with Secondary Guarantees	Variable Life	Variable Universal Life	Credit Life (N/A Fraternal)	Other Individual Life
1. Transfers to Separate Accounts:											
1.1 Net premiums for life contracts (a)	66,413,660	XXX						30,158	66,383,502	XXX	
1.2 Considerations for supplementary contracts with life contingencies	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
1.3 Aggregate write-ins for other transfers to Separate Accounts		XXX								XXX	
1.4 Totals (Lines 1.1 to 1.3)	66,413,660	XXX						30,158	66,383,502	XXX	
2. Transfers on account of deposit-type contracts (including \$ deposits less \$ withdrawals)		XXX								XXX	
3. Net investment income and capital gains and losses	249,874,680	XXX						238,211	249,636,469	XXX	
4. Aggregate write-ins for other income		XXX								XXX	
5. Totals (Lines 1.4 to 4)	316,288,340	XXX						268,369	316,019,971	XXX	
DEDUCT:											
6. Transfers from the Separate Account on account of contract benefits:											
6.1 Death benefits	7,648,117	XXX							7,648,117	XXX	
6.2 Matured endowments		XXX								XXX	
6.3 Annuity benefits	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.4 Payments on supplementary contracts with life contingencies	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.5 Accident and health benefits	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.6 Surrender benefits and withdrawals for life contracts	42,661,074	XXX						71,574	42,589,500	XXX	
6.7 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits		XXX								XXX	
7. Transfers on account of policy loans	23,448,240	XXX						9,901	23,438,339	XXX	
8. Net transfer of reserves from or (to) Separate Accounts	(8,731,713)	XXX						(622)	(8,731,091)	XXX	
9. Other transfers from the Separate Accounts:											
9.1 Federal and foreign income taxes incurred		XXX								XXX	
9.2 Change in expense allowances recognized in reserves	3,151,201	XXX							3,151,201	XXX	
9.3 Aggregate write-ins for other transfers from Separate Accounts	2,067	XXX							2,067	XXX	
10. Subtotals (Lines 6.1 to 9.3)	68,178,986	XXX						80,853	68,098,133	XXX	
11. Fees associated with charges for investment management, administration and contract guarantees	50,612,819	XXX						58,688	50,554,131	XXX	
12. Increase in aggregate reserve for life and accident and health contracts	197,541,598	XXX						128,828	197,412,770	XXX	
13. Increase in liability for deposit-type contracts		XXX								XXX	
14. Increase in reserve for future federal income taxes		XXX								XXX	
15. Aggregate write-ins for reserves and funds	(45,063)	XXX							(45,063)	XXX	
16. Totals (Lines 10 to 15)	316,288,340	XXX						268,369	316,019,971	XXX	
17. Net gain from operations (including \$ unrealized capital gains) (Line 5 minus Line 16)		XXX								XXX	
18. Policies/certificates in force end of year	23,661	XXX						22	23,639	XXX	
<b>DETAILS OF WRITE-INS</b>											
01.301.		XXX								XXX	
01.302.		XXX								XXX	
01.303.		XXX								XXX	
01.398. Summary of remaining write-ins for Line 1.3 from overflow page		XXX								XXX	
01.399. Totals (Lines 01.301 thru 01.303 plus 01.398) (Line 1.3 above)		XXX								XXX	
0401.		XXX								XXX	
0402.		XXX								XXX	
0403.		XXX								XXX	
0498. Summary of remaining write-ins for Line 4 from overflow page		XXX								XXX	
0499. Totals (Lines 0401 thru 0403 plus 0498) (Line 4 above)		XXX								XXX	
06.701.		XXX								XXX	
06.702.		XXX								XXX	
06.703.		XXX								XXX	
06.798. Summary of remaining write-ins for Line 6.7 from overflow page		XXX								XXX	
06.799. Totals (Lines 06.701 thru 06.703 plus 06.798) (Line 6.7 above)		XXX								XXX	
09.301. Miscellaneous	2,067	XXX							2,067	XXX	
09.302.		XXX								XXX	
09.303.		XXX								XXX	
09.398. Summary of remaining write-ins for Line 9.3 from overflow page		XXX								XXX	
09.399. Totals (Lines 09.301 thru 09.303 plus 09.398) (Line 9.3 above)	2,067	XXX							2,067	XXX	
1501. Claims in course of settlement	(45,063)	XXX							(45,063)	XXX	
1502.		XXX								XXX	
1503.		XXX								XXX	
1598. Summary of remaining write-ins for Line 15 from overflow page		XXX								XXX	
1599. Totals (Lines 1501 thru 1503 plus 1598) (Line 15 above)	(45,063)	XXX							(45,063)	XXX	

(a) Include premium amounts for preneed plans included in Line 1  
(b) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected.

**ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company**  
**ANALYSIS OF OPERATIONS BY LINES OF BUSINESS - GROUP LIFE INSURANCE (c)**  
**(N/A Fraternal)**

	1	2	3	4	5	6	7	8
	Total	Whole Life	Term Life	Universal Life	Variable Life	Variable Universal Life	Credit Life	Other Group Life (a)
1. Transfers to Separate Accounts:								
1.1 Net premiums for life contracts (b)	43,539,931					43,539,931	XXX	
1.2 Considerations for supplementary contracts with life contingencies	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
1.3 Aggregate write-ins for other transfers to Separate Accounts							XXX	
1.4 Totals (Lines 1.1 to 1.3)	43,539,931					43,539,931	XXX	
2. Transfers on account of deposit-type contracts (including \$ deposits less \$ withdrawals)							XXX	
3. Net investment income and capital gains and losses	32,122,719					32,122,719	XXX	
4. Aggregate write-ins for other income							XXX	
5. Totals (Lines 1.4 to 4)	75,662,650					75,662,650	XXX	
DEDUCT:								
6. Transfers from the Separate Account on account of contract benefits:								
6.1 Death benefits	7,887,363					7,887,363	XXX	
6.2 Matured endowments							XXX	
6.3 Annuity benefits	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.4 Payments on supplementary contracts with life contingencies	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.5 Accident and health benefits	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.6 Surrender benefits and withdrawals for life contracts	8,774,241					8,774,241	XXX	
6.7 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits							XXX	
7. Transfers on account of policy loans	(708,198)					(708,198)	XXX	
8. Net transfer of reserves from or (to) Separate Accounts	(92,621)					(92,621)	XXX	
9. Other transfers from the Separate Accounts:								
9.1 Federal and foreign income taxes incurred							XXX	
9.2 Change in expense allowances recognized in reserves							XXX	
9.3 Aggregate write-ins for other transfers from Separate Accounts	8,402					8,402	XXX	
10. Subtotals (Lines 6.1 to 9.3)	15,869,187					15,869,187	XXX	
11. Fees associated with charges for investment management, administration and contract guarantees	21,159,430					21,159,430	XXX	
12. Increase in aggregate reserve for life and accident and health contracts	38,634,033					38,634,033	XXX	
13. Increase in liability for deposit-type contracts							XXX	
14. Increase in reserve for future federal income taxes							XXX	
15. Aggregate write-ins for reserves and funds							XXX	
16. Totals (Lines 10 to 15)	75,662,650					75,662,650	XXX	
17. Net gain from operations (including \$ unrealized capital gains) (Line 5 minus Line 16)							XXX	
18. Policies/certificates in force end of year	6,784					6,784	XXX	
<b>DETAILS OF WRITE-INS</b>								
01.301. ....							XXX	
01.302. ....							XXX	
01.303. ....							XXX	
01.398. Summary of remaining write-ins for Line 1.3 from overflow page							XXX	
01.399. Totals (Lines 01.301 thru 01.303 plus 01.398) (Line 1.3 above)							XXX	
04.01. ....							XXX	
04.02. ....							XXX	
04.03. ....							XXX	
04.98. Summary of remaining write-ins for Line 4 from overflow page							XXX	
04.99. Totals (Lines 04.01 thru 04.03 plus 04.98) (Line 4 above)							XXX	
06.701. ....							XXX	
06.702. ....							XXX	
06.703. ....							XXX	
06.798. Summary of remaining write-ins for Line 6.7 from overflow page							XXX	
06.799. Totals (Lines 06.701 thru 06.703 plus 06.798) (Line 6.7 above)							XXX	
09.301. Miscellaneous	8,402					8,402	XXX	
09.302. ....							XXX	
09.303. ....							XXX	
09.398. Summary of remaining write-ins for Line 9.3 from overflow page							XXX	
09.399. Totals (Lines 09.301 thru 09.303 plus 09.398) (Line 9.3 above)	8,402					8,402	XXX	
15.01. ....							XXX	
15.02. ....							XXX	
15.03. ....							XXX	
15.98. Summary of remaining write-ins for Line 15 from overflow page							XXX	
15.99. Totals (Lines 15.01 thru 15.03 plus 15.98) (Line 15 above)							XXX	

(a) Includes the following amounts for FEGLI/SGLI: Line 1, Line 10, Line 16, Line 23, Line 24

(b) Include premium amounts for preneed plans included in Line 1

(c) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected.

**ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company**  
**ANALYSIS OF OPERATIONS BY LINES OF BUSINESS - INDIVIDUAL ANNUITIES (a)**

	1 Total	Deferred			6 Life Contingent Payout (Immediate and Annuityizations)	7 Other Annuities
		2 Fixed Annuities	3 Indexed Annuities	4 Variable Annuities With Guarantees		
1. Transfers to Separate Accounts:						
1.1 Net annuity considerations for annuity contracts	153,524,517	XXX	XXX	153,263,734	260,783	XXX
1.2 Considerations for supplementary contracts with life contingencies				XXX	XXX	
1.3 Aggregate write-ins for other transfers to Separate Accounts						
1.4 Totals (Lines 1.1 to 1.3)	153,524,517			153,263,734	260,783	
2. Transfers on account of deposit-type contracts (including \$ withdrawals)						
3. Net investment income and capital gains and losses	1,250,990,704			1,228,195,088	14,569,039	8,226,577
4. Aggregate write-ins for other income	273				273	
5. Totals (Lines 1.4 to 4)	1,404,515,494			1,381,458,822	14,830,095	8,226,577
DEDUCT:						
6. Transfers from the Separate Account on account of contract benefits:						
6.1 Death benefits						
6.2 Matured endowments						
6.3 Annuity benefits	165,469,117			158,762,173	2,021,047	4,685,897
6.4 Payments on supplementary contracts with life contingencies		XXX	XXX	XXX	XXX	XXX
6.5 Accident and health benefits	XXX	XXX	XXX	XXX	XXX	XXX
6.6 Surrender benefits and withdrawals for life contracts	996,183,810			986,662,782	9,478,904	42,124
6.7 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits						
7. Transfers on account of policy loans	(58,284)			(58,284)		
8. Net transfer of reserves from or (to) Separate Accounts	3,134,453			2,790,935	3,779	339,739
9. Other transfers from the Separate Accounts:						
9.1 Federal and foreign income taxes incurred						
9.2 Change in expense allowances recognized in reserves	(6,838,511)			(6,833,190)	(5,321)	
9.3 Aggregate write-ins for other transfers from Separate Accounts	57,195			56,161		1,034
10. Subtotals (Lines 6.1 to 9.3)	1,157,947,780			1,141,380,577	11,498,409	5,068,794
11. Fees associated with charges for investment management, administration and contract guarantees	139,894,636			139,417,113	642,738	(165,215)
12. Increase in aggregate reserve for life and accident and health contracts	106,494,187			100,503,980	2,667,209	3,322,998
13. Increase in liability for deposit-type contracts	37,170			37,170		
14. Increase in reserve for future federal income taxes						
15. Aggregate write-ins for reserves and funds	141,721			119,982	21,739	
16. Totals (Lines 10 to 15)	1,404,515,494			1,381,458,822	14,830,095	8,226,577
17. Net gain from operations (including \$ unrealized capital gains) (Line 5 minus Line 16)						
18. Policies/certificates in force end of year	89,798			88,013	1,226	559
<b>DETAILS OF WRITE-INS</b>						
01.301. Miscellaneous	273				273	
01.302. Summary of remaining write-ins for Line 1.3 from overflow page						
01.303. Totals (Lines 01.301 thru 01.303 plus 01.398) (Line 1.3 above)						
01.398. Summary of remaining write-ins for Line 1.3 from overflow page						
01.399. Totals (Lines 01.301 thru 01.303 plus 01.398) (Line 1.3 above)						
04.01. Miscellaneous	273				273	
04.02. Summary of remaining write-ins for Line 4 from overflow page						
04.03. Totals (Lines 04.01 thru 04.03 plus 04.98) (Line 4 above)						
04.98. Summary of remaining write-ins for Line 4 from overflow page						
04.99. Totals (Lines 04.01 thru 04.03 plus 04.98) (Line 4 above)						
06.701. Miscellaneous						
06.702. Summary of remaining write-ins for Line 6.7 from overflow page						
06.703. Totals (Lines 06.701 thru 06.703 plus 06.798) (Line 6.7 above)						
06.798. Summary of remaining write-ins for Line 6.7 from overflow page						
06.799. Totals (Lines 06.701 thru 06.703 plus 06.798) (Line 6.7 above)						
09.301. Miscellaneous	57,195			56,161		1,034
09.302. Summary of remaining write-ins for Line 9.3 from overflow page						
09.303. Totals (Lines 09.301 thru 09.303 plus 09.398) (Line 9.3 above)						
09.398. Summary of remaining write-ins for Line 9.3 from overflow page						
09.399. Totals (Lines 09.301 thru 09.303 plus 09.398) (Line 9.3 above)						
15.01. Change in annuitant mortality fluctuation fund	141,721			119,982	21,739	
15.02. Summary of remaining write-ins for Line 15 from overflow page						
15.03. Totals (Lines 15.01 thru 15.03 plus 15.98) (Line 15 above)						
15.98. Summary of remaining write-ins for Line 15 from overflow page						
15.99. Totals (Lines 15.01 thru 15.03 plus 15.98) (Line 15 above)						

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected.



**ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company**  
**ANALYSIS OF OPERATIONS BY LINES OF BUSINESS - GROUP ANNUITIES (a)**  
**(N/A Fraternal)**

	1 Total	Deferred				6 Life Contingent Payout (Immediate and Annuitizations)	7 Other Annuities
		2 Fixed Annuities	3 Indexed Annuities	4 Variable Annuities With Guarantees	5 Variable Annuities Without Guarantees		
1. Transfers to Separate Accounts:							
1.1 Net annuity considerations for annuity contracts	3,244,331,211			1,531,843,642	1,712,487,569		
1.2 Considerations for supplementary contracts with life contingencies		XXX	XXX	XXX	XXX		XXX
1.3 Aggregate write-ins for other transfers to Separate Accounts							
1.4 Totals (Lines 1.1 to 1.3)	3,244,331,211			1,531,843,642	1,712,487,569		
2. Transfers on account of deposit-type contracts (including \$ 1,233,962,837 deposits less \$ 2,806,531,426 withdrawals)	(1,572,568,589)				(1,572,568,589)		
3. Net investment income and capital gains and losses	5,607,332,274			1,113,358,330	4,493,973,944		
4. Aggregate write-ins for other income	30,495,474				30,495,474		
5. Totals (Lines 1.4 to 4)	7,309,590,370			2,645,201,972	4,664,388,398		
DEDUCT:							
6. Transfers from the Separate Account on account of contract benefits:							
6.1 Death benefits							
6.2 Matured endowments	121,536,642			66,479,482	55,057,160		
6.3 Annuity benefits							
6.4 Payments on supplementary contracts with life contingencies		XXX	XXX	XXX	XXX		XXX
6.5 Accident and health benefits	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.6 Surrender benefits and withdrawals for life contracts	8,083,239,496			3,454,192,884	4,629,046,612		
6.7 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits							
7. Transfers on account of policy loans	1,026,952				1,026,952		
8. Net transfer of reserves from or (to) Separate Accounts	(61,079,168)			(29,056,489)	(32,022,679)		
9. Other transfers from the Separate Accounts:							
9.1 Federal and foreign income taxes incurred							
9.2 Change in expense allowances recognized in reserves							
9.3 Aggregate write-ins for other transfers from Separate Accounts							
10. Subtotals (Lines 6.1 to 9.3)	8,144,723,922			3,491,615,877	4,653,108,045		
11. Fees associated with charges for investment management, administration and contract guarantees	161,218,690			82,976,309	78,242,381		
12. Increase in aggregate reserve for life and accident and health contracts	(904,187,121)			(937,005,463)	32,818,342		
13. Increase in liability for deposit-type contracts	(99,780,370)				(99,780,370)		
14. Increase in reserve for future federal income taxes							
15. Aggregate write-ins for reserves and funds							
16. Totals (Lines 10 to 15)	7,301,975,121			2,637,586,723	4,664,388,398		
17. Net gain from operations (including \$ (4,600,052) unrealized capital gains) (Line 5 minus Line 16)	7,615,249			7,615,249			
18. Policies/certificates in force end of year	456,124			222,674	233,450		
<b>DETAILS OF WRITE-INS</b>							
01.301.							
01.302.							
01.303.							
01.398. Summary of remaining write-ins for Line 1.3 from overflow page							
01.399. Totals (Lines 01.301 thru 01.303 plus 01.398) (Line 1.3 above)							
0401. Miscellaneous	30,495,474				30,495,474		
0402.							
0403.							
0498. Summary of remaining write-ins for Line 4 from overflow page							
0499. Totals (Lines 0401 thru 0403 plus 0498) (Line 4 above)	30,495,474				30,495,474		
06.701.							
06.702.							
06.703.							
06.798. Summary of remaining write-ins for Line 6.7 from overflow page							
06.799. Totals (Lines 06.701 thru 06.703 plus 06.798) (Line 6.7 above)							
09.301.							
09.302.							
09.303.							
09.398. Summary of remaining write-ins for Line 9.3 from overflow page							
09.399. Totals (Lines 09.301 thru 09.303 plus 09.398) (Line 9.3 above)							
1501.							
1502.							
1503.							
1598. Summary of remaining write-ins for Line 15 from overflow page							
1599. Totals (Lines 1501 thru 1503 plus 1598) (Line 15 above)							

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected.

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company  
**ANALYSIS OF OPERATIONS BY LINES OF BUSINESS - ACCIDENT AND HEALTH (a)**

	1 Total	Comprehensive (Hospital & Medical)		4 Medicare Supplement	5 Vision Only	6 Dental Only	7 Federal Employees Health Benefits Plan	8 Title XVIII Medicare	9 Title XIX Medicaid	10 Credit A&H	11 Disability Income	12 Long-Term Care	13 Other Health
		2 Individual	3 Group										
1. Transfers to Separate Accounts:													
1.1 Net Premiums for accident and health contracts													
1.2 Considerations for supplementary contracts with life contingencies	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
1.3 Aggregate write-ins for other transfers to Separate Accounts													
1.4 Totals (Lines 1.1 to 1.3)													
2. Transfers on account of deposit-type contracts (including \$ deposits less \$ withdrawals)													
3. Net investment income and capital gains and losses													
4. Aggregate write-ins for other income													
5. Totals (Lines 1.4 to 4)													
DEDUCT:													
6. Transfers from the Separate Account on account of contract benefits:													
6.1 Death benefits	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.2 Matured endowments	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.3 Annuity benefits	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.4 Payments on supplementary contracts with life contingencies	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.5 Accident and health benefits													
6.6 Surrender benefits and withdrawals for life contracts	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6.7 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits													
7. Transfers on account of policy loans	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
8. Net transfer of reserves from or (to) Separate Accounts													
9. Other transfers from the Separate Accounts:													
9.1 Federal and foreign income taxes incurred	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
9.2 Change in expense allowances recognized in reserves	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
9.3 Aggregate write-ins for other transfers from Separate Accounts													
10. Subtotals (Lines 6.1 to 9.3)													
11. Fees associated with charges for investment management, administration and contract guarantees													
12. Increase in aggregate reserve for life and accident and health contracts													
13. Increase in liability for deposit-type contracts	XXX	XXX		XXX		XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
14. Increase in reserve for future federal income taxes													
15. Aggregate write-ins for reserves and funds													
16. Totals (Lines 10 to 15)													
17. Net gain from operations (including \$ unrealized capital gains) (Line 5 minus Line 16)													
18. Policies/certificates in force end of year													
<b>DETAILS OF WRITE-INS</b>													
01.301.													
01.302.													
01.303.													
01.398. Summary of remaining write-ins for Line 1.3 from overflow page													
01.399. Totals (Lines 01.301 thru 01.303 plus 01.398) (Line 1.3 above)													
0401.													
0402.													
0403.													
0498. Summary of remaining write-ins for Line 4 from overflow page													
0499. Totals (Lines 0401 thru 0403 plus 0498) (Line 4 above)													
06.701.													
06.702.													
06.703.													
06.798. Summary of remaining write-ins for Line 6.7 from overflow page													
06.799. Totals (Lines 06.701 thru 06.703 plus 06.798) (Line 6.7 above)													
09.301.													
09.302.													
09.303.													
09.398. Summary of remaining write-ins for Line 9.3 from overflow page													
09.399. Totals (Lines 09.301 thru 09.303 plus 09.398) (Line 9.3 above)													
1501.													
1502.													
1503.													
1598. Summary of remaining write-ins for Line 15 from overflow page													
1599. Totals (Lines 1501 thru 1503 plus 1598) (Line 15 above)													

**NONE**

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected.

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company  
**ANALYSIS OF INCREASE IN RESERVES DURING THE YEAR - INDIVIDUAL LIFE INSURANCE (a)**

	1	2	3	4	5	6	7	8	9	10	11
	Total	Industrial Life	Whole Life	Term Life	Indexed Life	Universal Life	Universal Life With Secondary Guarantees	Variable Life	Variable Universal Life	Credit Life (N/A Fraternal)	Other Individual Life
1. Reserve December 31 of prior year .....	1,279,508,887	XXX						2,173,547	1,277,335,340	XXX	
2. Tabular net premiums and considerations for annuities and supplementary contracts with life contingencies .....	66,413,660	XXX						30,158	66,383,502	XXX	
3. Increase or (decrease) from investment results after provision for federal income taxes .....	249,874,679	XXX						238,211	249,636,468	XXX	
4. Tabular less actual reserve released .....		XXX								XXX	
5. Increase in reserve on account of change in valuation basis .....		XXX								XXX	
5.1 Change in excess of VM-20 deterministic/stochastic reserve over net premium reserve .....		XXX								XXX	
6. Other increases (net) .....	(2,067)	XXX							(2,067)	XXX	
7. Totals (Lines 1 to 6) .....	1,595,795,159	XXX						2,441,916	1,593,353,243	XXX	
8. Net transfer of reserves from or (to) Separate Accounts .....	(8,731,713)	XXX						(622)	(8,731,091)	XXX	
9. Tabular cost .....	41,128,076	XXX						48,688	41,079,388	XXX	
10. Reserves released by death .....	7,648,117	XXX							7,648,117	XXX	
11. Reserves released by other terminations (net) .....	42,661,074	XXX						71,574	42,589,500	XXX	
12. Transfers on account of annuity and supplementary contract payments involving life contingencies .....	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
13. Charges for investment management, administration and contract guarantees .....	9,484,743	XXX						10,000	9,474,743	XXX	
14. Aggregate write-ins for other decreases in reserves .....	26,554,378	XXX						9,901	26,544,477	XXX	
15. Total deductions (Lines 8 to 14) .....	118,744,675	XXX						139,541	118,605,134	XXX	
16. Reserve December 31 of current year .....	1,477,050,484	XXX						2,302,375	1,474,748,109	XXX	
<b>Cash Surrender Value and Policy Loans</b>											
17. CSV ending balance December 31, current year .....	1,461,381,401	XXX						1,412,291	1,459,969,110	XXX	
18. Amount available for policy loans based upon Line 17 CSV .....	1,169,105,121	XXX						1,129,833	1,167,975,288	XXX	
<b>DETAILS OF WRITE-INS</b>											
1401. Change in policy loans .....	23,448,240	XXX						9,901	23,438,339	XXX	
1402. Change in surrender charge offset .....	3,151,201	XXX							3,151,201	XXX	
1403. Claims in course of settlement .....	(45,063)	XXX							(45,063)	XXX	
1498. Summary of remaining write-ins for Line 14 from overflow page .....		XXX								XXX	
1499. TOTALS (Lines 1401 thru 1403 plus 1498) (Line 14 above) .....	26,554,378	XXX						9,901	26,544,477	XXX	

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected. ....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company  
**ANALYSIS OF INCREASE IN RESERVES DURING THE YEAR - GROUP LIFE INSURANCE (a)**  
**(N/A Fraternal)**

	1 Total	2 Whole Life	3 Term Life	4 Universal Life	5 Variable Life	6 Variable Universal Life	7 Credit Life	8 Other Group Life
1. Reserve December 31 of prior year .....	1,680,959,802					1,680,959,802	XXX	
2. Tabular net premiums and considerations .....	43,539,931					43,539,931	XXX	
3. Increase or (decrease) from investment results after provision for federal income taxes .....	32,114,815					32,114,815	XXX	
4. Tabular less actual reserve released .....							XXX	
5. Increase in reserve on account of change in valuation basis .....							XXX	
6. Other increases (net) .....	(498)					(498)	XXX	
7. Totals (Lines 1 to 6) .....	1,756,614,050					1,756,614,050	XXX	
8. Net transfer of reserves from or (to) Separate Accounts .....	(92,621)					(92,621)	XXX	
9. Tabular cost .....						XXX	XXX	
10. Reserves released by death .....	7,887,363					7,887,363	XXX	
11. Reserves released by other terminations (net) .....	8,774,241					8,774,241	XXX	
12. Transfers on account of annuity and supplementary contract payments involving life contingencies .....	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
13. Charges for investment management, administration and contract guarantees .....	21,159,430					21,159,430	XXX	
14. Aggregate write-ins for other decreases in reserves .....	(708,198)					(708,198)	XXX	
15. Total deductions (Lines 8 to 14) .....	37,020,215					37,020,215	XXX	
16. Reserve December 31 of current year .....	1,719,593,835					1,719,593,835	XXX	
<b>Cash Surrender Value and Policy Loans</b>								
17. CSV ending balance December 31, current year .....	1,718,190,401					1,718,190,401	XXX	
18. Amount available for policy loans based upon line 17 CSV .....	1,374,552,321					1,374,552,321	XXX	
<b>DETAILS OF WRITE-INS</b>								
1401. Change in policy loans .....	(708,198)					(708,198)	XXX	
1402. ....							XXX	
1403. ....							XXX	
1498. Summary of remaining write-ins for Line 14 from overflow page .....							XXX	
1499. TOTALS (Lines 1401 thru 1403 plus 1498) (Line 14 above) .....	(708,198)					(708,198)	XXX	

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected. ....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company  
**ANALYSIS OF INCREASE IN RESERVES DURING THE YEAR - INDIVIDUAL ANNUITIES (a)**

	1 Total	Deferred				6 Life Contingent Payout (Immediate and Annuityizations)	7 Other Annuities
		2 Fixed Annuities	3 Indexed Annuities	4 Variable Annuities With Guarantees	5 Variable Annuities Without Guarantees		
1. Reserve December 31 of prior year .....	7,951,101,791			7,819,663,266	83,911,358	47,527,167	
2. Tabular net premiums and considerations .....	153,524,517			153,263,734	260,783		
3. Increase or (decrease) from investment results after provision for federal income taxes .....	1,250,952,613			1,228,156,997	14,569,039	8,226,577	
4. Tabular less actual reserve released .....							
5. Increase in reserve on account of change in valuation basis .....							
6. Other increases (net) .....	(56,925)			(2,199,864)	2,143,973	(1,034)	
7. Totals (Lines 1 to 6) .....	9,355,521,996			9,198,884,133	100,885,153	55,752,710	
8. Net transfer of reserves from or (to) Separate Accounts .....	3,134,452			2,790,936	3,779	339,737	
9. Tabular cost .....							
10. Reserves released by death .....	.XXX	.XXX	.XXX	.XXX	.XXX	.XXX	.XXX
11. Reserves released by other terminations (net) .....	996,183,810			986,662,782	9,478,904	42,124	
12. Transfers on account of annuity and supplementary contract payments involving life contingencies .....	165,469,118			158,762,173	2,021,047	4,685,898	
13. Charges for investment management, administration and contract guarantees .....	139,893,713			139,416,189	642,739	(165,215)	
14. Aggregate write-ins for other decreases in reserves .....	(6,755,076)			(6,771,494)	16,418		
15. Total deductions (Lines 8 to 14) .....	1,297,926,017			1,280,860,586	12,162,887	4,902,544	
16. Reserve December 31 of current year .....	8,057,595,979			7,918,023,547	88,722,266	50,850,166	
<b>Cash Surrender Value and Policy Loans</b>							
17. CSV ending balance December 31, current year .....	7,949,501,082			7,864,985,052	84,516,030		
18. Amount available for policy loans based upon line 17 CSV .....	155,675,169			155,675,169			
<b>DETAILS OF WRITE-INS</b>							
1401. Change in surrender charge offset .....	(6,838,512)			(6,833,191)	(5,321)		
1402. Change in annuitant mortality fluctuation fund .....	141,720			119,981	21,739		
1403. Change in policy loans .....	(58,284)			(58,284)			
1498. Summary of remaining write-ins for Line 14 from overflow page .....							
1499. TOTALS (Lines 1401 thru 1403 plus 1498) (Line 14 above) .....	(6,755,076)			(6,771,494)	16,418		

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected. ....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company  
**ANALYSIS OF INCREASE IN RESERVES DURING THE YEAR - GROUP ANNUITIES (a)**  
**(N/A Fraternal)**

	1 Total	Deferred				6 Life Contingent Payout (Immediate and Annuitizations)	7 Other Annuities
		2 Fixed Annuities	3 Indexed Annuities	4 Variable Annuities With Guarantees	5 Variable Annuities Without Guarantees		
1. Reserve December 31 of prior year .....	32,597,567,411			15,819,572,776	16,777,994,635		
2. Tabular net premiums and considerations .....	3,244,331,212			1,531,843,642	1,712,487,570		
3. Increase or (decrease) from investment results after provision for federal income taxes .....	4,120,844,775			1,105,743,082	3,015,101,693		
4. Tabular less actual reserve released .....							
5. Increase in reserve on account of change in valuation basis .....							
6. Other increases (net) .....							
7. Totals (Lines 1 to 6) .....	39,962,743,398			18,457,159,500	21,505,583,898		
8. Net transfer of reserves from or (to) Separate Accounts .....	(61,079,168)			(29,056,488)	(32,022,680)		
9. Tabular cost .....							
10. Reserves released by death .....	.XXX	.XXX	.XXX	.XXX	.XXX	.XXX	.XXX
11. Reserves released by other terminations (net) .....	8,083,239,496			3,454,192,884	4,629,046,612		
12. Transfers on account of annuity and supplementary contract payments involving life contingencies .....	121,536,642			66,479,482	55,057,160		
13. Charges for investment management, administration and contract guarantees .....	124,639,185			82,976,309	41,662,876		
14. Aggregate write-ins for other decreases in reserves .....	1,026,951				1,026,951		
15. Total deductions (Lines 8 to 14) .....	8,269,363,106			3,574,592,187	4,694,770,919		
16. Reserve December 31 of current year .....	31,693,380,292			14,882,567,313	16,810,812,979		
<b>Cash Surrender Value and Policy Loans</b>							
17. CSV ending balance December 31, current year .....							
18. Amount available for policy loans based upon line 17 CSV .....							
<b>DETAILS OF WRITE-INS</b>							
1401. Change in policy loans .....	1,026,951				1,026,951		
1402. ....							
1403. ....							
1498. Summary of remaining write-ins for Line 14 from overflow page .....							
1499. TOTALS (Lines 1401 thru 1403 plus 1498) (Line 14 above) .....	1,026,951				1,026,951		

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected. ....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company  
**ANALYSIS OF RESERVES DURING THE YEAR - ACCIDENT AND HEALTH(a)**

	1 Total	Comprehensive		4 Medicare Supplement	5 Vision Only	6 Dental Only	7 Federal Employees Health Benefits Plan	8 Title XVIII Medicare	9 Title XIX Medicaid	10 Credit A&H	11 Disability Income	12 Long-Term Care	13 Other Health
		2 Individual	3 Group										
<b>ACTIVE LIFE RESERVE</b>													
1. Unearned premium reserves .....													
2. Additional contract reserves (a) .....													
3. Additional actuarial reserves-Asset/Liability analysis .....													
4. Reserve for future contingent benefits .....													
5. Reserve for rate credits .....													
6. Aggregate write-ins for reserves .....													
7. Totals (Gross) .....													
8. Reinsurance ceded .....													
9. Totals (Net)													
<b>CLAIM RESERVE</b>													
10. Present value of amounts not yet due on claims .....													
11. Additional actuarial reserves-Asset/Liability analysis .....													
12. Reserve for future contingent benefits .....													
13. Aggregate write-ins for reserves .....													
14. Totals (Gross) .....													
15. Reinsurance ceded .....													
16. Totals (Net)													
17. TOTAL (Net)													
18. TABULAR FUND INTEREST													
<b>DETAILS OF WRITE-INS</b>													
0601. ....													
0602. ....													
0603. ....													
0698. Summary of remaining write-ins for Line 6 from overflow page .....													
0699. TOTALS (Lines 0601 thru 0603 plus 0698) (Line 6 above)													
1301. ....													
1302. ....													
1303. ....													
1398. Summary of remaining write-ins for Line 13 from overflow page .....													
1399. TOTALS (Lines 1301 thru 1303 plus 1398) (Line 13 above)													

**NONE**

(a) Indicate if blocks of business in run-off that comprise less than 5% of premiums and less than 5% of reserve and loans liability are aggregated with material blocks of business and which columns are affected. ....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**EXHIBIT OF NET INVESTMENT INCOME**

	1 Collected During Year	2 Earned During Year
1. U.S. Government bonds	(a) 48,538,590	54,842,336
1.1 Bonds exempt from U.S. tax	(a)	
1.2 Other bonds (unaffiliated)	(a) 625,940,160	612,722,794
1.3 Bonds of affiliates	(a)	
2.1 Preferred stocks (unaffiliated)	(b) 273,480	273,480
2.11 Preferred stocks of affiliates	(b)	
2.2 Common stocks (unaffiliated)	2,000,574,199	2,000,595,536
2.21 Common stocks of affiliates		
3. Mortgage loans	(c)	
4. Real estate	(d)	
5. Contract loans		
6. Cash, cash equivalents and short-term investments	(e) 10,350,771	11,299,884
7. Derivative instruments	(f) (5,248,694)	(10,253,199)
8. Other invested assets	445,789	443,777
9. Aggregate write-ins for investment income	(1,023,927)	(1,023,927)
10. Total gross investment income	2,679,850,368	2,668,900,681
11. Investment expenses		(g) 1,038,547
12. Investment taxes, licenses and fees, excluding federal income taxes		(g)
13. Interest expense		(h) 124,952
14. Depreciation on real estate and other invested assets		(i)
15. Aggregate write-ins for deductions from investment income		
16. Total deductions (Lines 11 through 15)		1,163,499
17. Net investment income (Line 10 minus Line 16)		2,667,737,182
<b>DETAILS OF WRITE-INS</b>		
0901. Miscellaneous	(1,023,927)	(1,023,927)
0902.		
0903.		
0998. Summary of remaining write-ins for Line 9 from overflow page		
0999. Totals (Lines 0901 thru 0903 plus 0998) (Line 9, above)	(1,023,927)	(1,023,927)
1501.		
1502.		
1503.		
1598. Summary of remaining write-ins for Line 15 from overflow page		
1599. Totals (Lines 1501 thru 1503 plus 1598) (Line 15, above)		

- (a) Includes \$ 20,431,552 accrual of discount less \$ 13,572,193 amortization of premium and less \$ 24,103,253 paid for accrued interest on purchases.
- (b) Includes \$ accrual of discount less \$ amortization of premium and less \$ paid for accrued dividends on purchases.
- (c) Includes \$ accrual of discount less \$ amortization of premium and less \$ paid for accrued interest on purchases.
- (d) Includes \$ for company's occupancy of its own buildings; and excludes \$ interest on encumbrances.
- (e) Includes \$ 840,355 accrual of discount less \$ amortization of premium and less \$ paid for accrued interest on purchases.
- (f) Includes \$ accrual of discount less \$ amortization of premium.
- (g) Includes \$ investment expenses and \$ investment taxes, licenses and fees, excluding federal income taxes, attributable to segregated and Separate Accounts.
- (h) Includes \$ interest on surplus notes and \$ interest on capital notes.
- (i) Includes \$ depreciation on real estate and \$ depreciation on other invested assets.

**EXHIBIT OF CAPITAL GAINS (LOSSES)**

	1	2	3	4	5
	Realized Gain (Loss) On Sales or Maturity	Other Realized Adjustments	Total Realized Capital Gain (Loss) (Columns 1 + 2)	Change in Unrealized Capital Gain (Loss)	Change in Unrealized Foreign Exchange Capital Gain (Loss)
1. U.S. Government bonds	(119,092,955)		(119,092,955)	144,598,769	
1.1 Bonds exempt from U.S. tax					
1.2 Other bonds (unaffiliated)	(361,607,154)		(361,607,154)	783,302,819	
1.3 Bonds of affiliates					
2.1 Preferred stocks (unaffiliated)				(287,472)	
2.11 Preferred stocks of affiliates					
2.2 Common stocks (unaffiliated)	(1,112,670,979)		(1,112,670,979)	4,920,035,061	
2.21 Common stocks of affiliates					
3. Mortgage loans					
4. Real estate					
5. Contract loans					
6. Cash, cash equivalents and short-term investments	26,198,375		26,198,375		
7. Derivative instruments	(88,370,452)		(88,370,452)	9,543,833	
8. Other invested assets	141,964,995		141,964,995	128,927,243	
9. Aggregate write-ins for capital gains (losses)	41,084	5	41,089		24
10. Total capital gains (losses)	(1,513,537,086)	5	(1,513,537,081)	5,986,120,253	24
<b>DETAILS OF WRITE-INS</b>					
0901. Capital gain (loss) on foreign currency		5	5		24
0902. Gain on security litigation	41,084		41,084		
0903.					
0998. Summary of remaining write-ins for Line 9 from overflow page					
0999. Totals (Lines 0901 thru 0903 plus 0998) (Line 9, above)	41,084	5	41,089		24



ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**EXHIBIT 1 - INVESTMENT EXPENSES**

	1 Amount
1. Rent .....	
2. Salaries and wages .....	
3. Contributions for benefit plans for employees (a) .....	
4. Payments to employees under non-funded benefit plans .....	
5. Other employee welfare .....	
6. Legal fees and expenses .....	
7. Fees of public accountants and consulting actuaries .....	
8. Traveling expenses .....	
9. Postage, express, telegraph and telephone .....	
10. Printing and stationery .....	
11. Cost or depreciation of furniture and equipment .....	
12. Rental of equipment .....	
13. Books and periodicals .....	
14. Bureau and association fees .....	
15. Insurance, except on real estate .....	
16. Miscellaneous losses .....	
17. Collection and bank service charges .....	1,038,547
18. Sundry general expenses .....	
19. Real estate expenses .....	
20. Investment expenses not included elsewhere .....	
21. Aggregate write-ins for other investment expenses .....	
22. Investment expenses incurred .....	1,038,547
Reconciliation with Exhibit 5	
23. Investment expenses unpaid December 31, prior year .....	47,299
24. Investment expenses unpaid December 31, current year .....	91,984
25. Investment expenses paid during year (Lines 22 + 23 - 24) (to Exhibit 5, Line 12)	993,862
<b>DETAILS OF WRITE-INS</b>	
2101. ....	
2102. ....	
2103. ....	
2198. Summary of remaining write-ins for Line 21 from overflow page .....	
2199. Totals (Lines 2101 thru 2103 plus 2198) (Line 21 above)	

(a) Includes \$ ..... on account of prior service.

**EXHIBIT 2 - INVESTMENT TAXES, LICENSES AND FEES  
(EXCLUDING FEDERAL INCOME TAXES)**

	1 Amount
1. Real estate taxes .....	
2. State insurance department fees .....	
3. Other state taxes, including \$ ..... for employee benefits .....	
4. U.S. Social Security taxes .....	
5. All other taxes .....	
6. Taxes, licenses and fees incurred .....	
Reconciliation with Exhibit 5	
7. Taxes, licenses and fees unpaid December 31, prior year .....	
8. Taxes, licenses and fees unpaid December 31, current year .....	
9. Taxes, licenses and fees paid during year (Lines 6 + 7 - 8) (to Exhibit 5, Line 13)	

**NONE**

**EXHIBIT 3 - AGGREGATE RESERVE FOR LIFE, ANNUITY AND ACCIDENT AND HEALTH CONTRACTS**

1	2	3	4
Description of Valuation Basis	Total <sup>(a)</sup>	Ordinary	Group
0100001. 58 CSO 4.00% Mod CRVM .....	2,302,375	2,302,375	
0100002. 80 CSO 5.50% CRVM .....	26,808,342	26,808,342	
0100003. 80 CSO 5.00% CRVM .....	242,469	242,469	
0100004. 80 CSO 4.50% CRVM .....	802,316,987	802,316,987	
0100005. 80 CSO 4.00% CRVM .....	154,010,941	154,010,941	
0100006. 01 CSO 4.00% CRVM .....	24,367,746	24,367,746	
0100007. 01 CSO 3.50% CRVM .....	40,873,201	40,873,201	
0100008. 17 CSO 3.5% CRVM .....	5,276,437	5,276,437	
0100009. 17 CSO 3.0% CRVM .....	1,550,513	1,550,513	
0100010. 17 CSO NPR 3.75% .....	20,550,401	20,550,401	
0100011. 17 CSO NPR 4.50% .....	392,960	392,960	
0100012. 80 CSO Account Value .....	1,882,277,065	284,212,509	1,598,064,556
0100013. 01 CSO Account Value .....	99,680,583	83,983,289	15,697,294
0100014. 17 CSO Account Value .....	135,994,299	30,162,315	105,831,984
0199999. Life Insurance: Totals	3,196,644,319	1,477,050,485	1,719,593,834
0200001. Deferred Annuity 4.75%-10.00% CARVM .....	7,971,254,131	7,971,254,131	
0200002. Annuity Reserve 4 % VA Valuation 82 .....	86,341,849	86,341,849	
0200003. Annuity Reserve .....	31,693,380,292		31,693,380,292
0299999. Annuities: Totals	39,750,976,271	8,057,595,979	31,693,380,292
9999999. Totals (to Page 3, Line 1)	42,947,620,590	9,534,646,464	33,412,974,126

(a) Included in the above table are amounts of deposit-type contracts that originally contained a mortality risk. Amounts of deposit-type contracts that no longer contain a mortality risk in Column 2 are: Life Insurance \$ ..... ; Annuities \$ ..... ; Supplementary Contracts with Life Contingencies \$ ..... ; Accident and Health Contracts \$ ..... ; Miscellaneous Reserves \$ .....

**EXHIBIT 3 - INTERROGATORIES**

- 1.1 Has the reporting entity ever issued both participating and non-participating variable life insurance contracts?..... Yes [ X ] No [ ]
- 2.1 Does the reporting entity at present issue both participating and non-participating variable life insurance contracts?..... Yes [ X ] No [ ]
- 2.2 If not, state which kind is issued .....
- 3.1 Is any surrender value promised in excess of the reserve as legally computed? ..... Yes [ ] No [ X ] N/A [ ]
- 3.2 If so, the amount of such excess must be included in surrender values in excess of reserves otherwise required and carried in this schedule. Has this been done? ..... Yes [ ] No [ ] N/A [ X ]  
 Attach a statement of methods employed in the valuation of variable life insurance contracts issued at, or subsequently subject to, an extra premium or in the valuation of contracts otherwise issued on lives classified as substandard for the plan of contract issued or on special class lives (including paid-up variable life insurance).

**EXHIBIT 3A - CHANGES IN BASIS OF VALUATION DURING THE YEAR**

(Including supplementary contracts set up on a basis other than that used to determine benefits)

1	Valuation Basis		4
	2	3	
Description of Valuation Class	Changed From	Changed To	
<b>NONE</b>			
9999999 - Totals (Page 6, Line 5, Analysis of Increase in Reserves)			

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**EXHIBIT 4 - DEPOSIT TYPE CONTRACTS**

	1	2	3	4	5	6
	Total	Guaranteed Interest Contracts	Annuities Certain	Supplemental Contracts	Dividend Accumulations or Refunds	Premium and Other Deposit Funds
1. Balance at the beginning of the year .....	9,431,864,216					9,431,864,216
2. Deposits received during the year .....	1,232,667,467					1,232,667,467
3. Investment earnings credited to account .....	1,509,405,815					1,509,405,815
4. Other net change in reserves .....	3					3
5. Fees and other charges assessed .....	36,580,429					36,580,429
6. Surrender charges .....						
7. Net surrender or withdrawal payments .....	2,806,531,426					2,806,531,426
8. Other net transfer to or (from) general account .....	(1,295,370)					(1,295,370)
9. Balance at the end of current year (Lines 1+2+3+4-5-6-7-8)	9,332,121,016					9,332,121,016

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**EXHIBIT 5 - RECONCILIATION OF CASH AND INVESTED ASSETS**

DEVELOPMENT OF INCREASE IN CASH		1 Amount
1. Transfers to Separate Accounts on account of:		
1.1 Net premiums and considerations for annuities and supplementary contracts with life contingencies .....		3,507,809,320
1.2 Aggregate write-ins for other transfers to Separate Accounts .....		
2. Deposits on deposit-type contract funds and other liabilities without life or disability contingencies .....		1,233,962,837
3. Investment income collected .....		2,679,850,368
4. Consideration on disposal of short-term bonds net of purchases .....		(142,946,554)
5. Consideration on disposal of investments (excluding short-term bonds) .....		19,387,658,149
6. Aggregate write-ins for other increases in funds from operations .....		
7. Total (Lines 1 to 6) .....		26,666,334,120
8. Cost of investments acquired (excluding short-term bonds) .....		14,139,724,991
9. Transfers from Separate Accounts on account of contract benefits:		
9.1 Death benefits .....		14,772,739
9.2 Matured endowments .....		
9.3 Annuity benefits .....		287,005,759
9.4 Supplementary contract benefits with life contingencies .....		
9.5 Accident and health benefits .....		
9.6 Surrender benefits and withdrawals for life contracts .....		9,130,858,620
9.7 Policy loans (net) .....		23,708,710
9.8 Transfers of reserves (net) .....		(66,769,049)
9.9 Aggregate write-ins for other transfers from Separate Accounts on account of contract benefits .....		
10. Other transfers from Separate Accounts:		
10.1 Federal income taxes .....		
10.2 Aggregate write-ins for other transfers from Separate Accounts .....		92,785,388
11. Withdrawals on deposit-type contract funds and other liabilities without life or disability contingencies .....		2,806,531,426
12. Investment expenses (Exhibit 1, Line 25) .....		993,862
12.1 Fees associated with investment management, administration and contract guarantees .....		373,854,925
13. Investment taxes, licenses and fees, excluding federal income taxes (Exhibit 2, Line 9) .....		
14. Total (Lines 8 to 13) .....		26,803,467,371
15. Funds from operations (Line 7 minus Line 14) .....		(137,133,251)
16. Surplus contributed or (withdrawn) during year .....		
17. Aggregate write-ins for other changes in funds .....		
18. Total funds (includes \$ ..... 0 net transfers from general account) (Lines 15 to 17) .....		(137,133,251)
19. Increase in payable for investments acquired, net of receivable for investments sold .....		(30,125,647)
20. Decrease in policy loans .....		
21. Aggregate write-ins for other reconciling items .....		6
22. Increase in cash (Line 18 to 21) .....		(167,258,892)
<b>RECONCILIATION BETWEEN YEARS</b>		
23. Cash and invested assets, December 31st of prior year .....		53,203,528,077
24. Increase in cash (Line 22) .....		(167,258,892)
25. Cost of invested assets acquired .....		14,729,850,986
26. Adjusted cost of assets disposed of .....		21,346,424,629
27. Increase in policy loans .....		
28. Accrual of discount less amortization of premium .....		
29. Depreciation on real estate and other invested assets .....		
30. Increase in net unrealized gains .....		5,986,120,251
31. Aggregate write-ins for other reconciling items .....		
32. Cash and invested assets, December 31st of current year .....		52,405,815,793
<b>DETAILS OF WRITE-INS</b>		
01.201. Investment transfers GIA to SIA .....		
01.202. ....		
01.203. ....		
01.298. Summary of remaining write-ins for Line 1.2 from overflow page .....		
01.299. Totals (Lines 01.201 thru 01.203 plus 01.298) (Line 1.2 above) .....		
0601. ....		
0602. ....		
0603. ....		
0698. Summary of remaining write-ins for Line 6 from overflow page .....		
0699. Totals (Lines 0601 thru 0603 plus 0698) (Line 6 above) .....		
09.901. ....		
09.902. ....		
09.903. ....		
09.998. Summary of remaining write-ins for Line 9.9 from overflow page .....		
09.999. Totals (Lines 09.901 thru 09.903 plus 09.998) (Line 9.9 above) .....		
10.201. Change in derivative premiums .....		(17,089,902)
10.202. Change in remittances and items not allocated .....		116,747,487
10.203. Miscellaneous .....		(6,872,197)
10.298. Summary of remaining write-ins for Line 10.2 from overflow page .....		
10.299. Totals (Lines 10.201 thru 10.203 plus 10.298) (Line 10.2 above) .....		92,785,388
1701. ....		
1702. ....		
1703. ....		
1798. Summary of remaining write-ins for Line 17 from overflow page .....		
1799. Totals (Lines 1701 thru 1703 plus 1798) (Line 17 above) .....		
2101. Foreign currency gain/loss .....		6
2102. ....		
2103. ....		
2198. Summary of remaining write-ins for Line 21 from overflow page .....		
2199. Totals (Lines 2101 thru 2103 plus 2198) (Line 21 above) .....		6
3101. ....		
3102. ....		
3103. ....		
3198. Summary of remaining write-ins for Line 31 from overflow page .....		
3199. Totals (Lines 3101 thru 3103 plus 3198) (Line 31 above) .....		

**EXHIBIT 6 - GUARANTEED INSURANCE AND ANNUITY PRODUCTS**

	1	2
	Amount	Percent of Total
1. Aggregate reserve for life, annuity and accident and health contracts (Included in Exhibit 3):		
1.1 Life insurance .....		
1.2 Annuities .....		
1.3 Supplementary contracts with life contingencies .....		
1.4 Accident and health .....		
1.5 Miscellaneous reserves .....		
1.6 Total .....		
2. Liability for deposit-type contracts (included in Exhibit 4):		
2.1 Guaranteed interest contracts .....		
2.2 Annuities certain .....		
2.3 Supplemental contracts .....		
2.4 Dividend accumulations or refunds .....		
2.5 Premium and other deposit funds .....		
2.6 Total .....		
3. Other liabilities (included in Page 3, Lines 4, 10, 13 & 14) .....		
4. Total liabilities associated with guarantees (Lines 1.6 + 2.6 + 3) .....		
5. Total liabilities not associated with guarantees .....	52,454,718,896	100.0
6. Total Separate Accounts liabilities (Lines 4 + 5 = Page 3, Line 17)	52,454,718,896	100.0 %

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**GENERAL INTERROGATORIES**

**Product Mix**

1.01 Identify the product types in the separate account, quantify the assets associated with those products, indicate if there are any guarantees associated with those products, quantify seed money and quantify other fees and expenses due to the general account. For the products (and related assets) that are not registered with the SEC, identify whether the products are considered private placement variable annuity products or private placement life insurance.

Note: A distinct disaggregated product identifier shall be used for each product and shall be used consistently throughout the interrogatory. Disaggregation of reporting shall be such that each product filing or policy form is separately identified. For example, if a company has 5 different separate group annuities, each annuity shall be separately reported. (Companies may eliminate proprietary information however such elimination will require the use of unique reporting identifiers).

Additional Required Surplus Amounts is defined as additional or permanent surplus that is required to be retained in the separate account in accordance with state law or regulation. These amounts should not include reinvested separate account investment proceeds that have not been allocated to separate account contract holders.

1 Product Identifier	Separate Account Assets		4 Guarantees Associated with the Product Yes/No	5 Seed Money	6 Fees and Expenses Due to the General Account	7 Additional Required Surplus Amounts	Not Registered with SEC		
	2 Registered with SEC	3 Not Registered with SEC					Private Placement Variable Annuity	Private Placement Life Insurance	Other (Not PPVA or PPLI)
1.01A0001 Pension Risk Transfer Group Annuities									
1.01A9999 Total Pension Risk Transfer Group Annuities			XXX						
1.01B0001 All Other Group Annuities									
Separate Account Guaranteed Interest Contract		15,106,266,294	YES	137,913,382					15,106,266,294
Supplemental Account Non-guaranteed Retirement Services SIAs		26,158,490,631	NO						26,158,490,631
Synthetic Guaranteed Interest Contract			YES						
1.01B9999 Total All Other Group Annuities		41,264,756,925	XXX	137,913,382					41,264,756,925
1.01C0001 Registered Index Linked Annuities Individual Annuities									
1.01C9999 Total Registered Index Linked Annuities Individual Annuities			XXX						
1.01D0001 All Other Individual Annuities									
Individual Variable Annuity	8,054,950,133	446,818	YES						446,818
Individual Immediate Variable Annuity	50,850,278		YES						
1.01D9999 Total All Other Individual Annuities	8,105,800,411	446,818	XXX						446,818
1.01E0001 Life Insurance									
Individual Variable Universal Life	1,090,000,575	219,998,225	YES						219,998,225
Group Variable Universal Life	67,711,200		YES						
Corporate-owned Life Insurance	182,745,343	102,604,185	YES						102,604,185
Stable Value Bank-owned Life Insurance		1,558,568,594	YES						1,558,568,594
Exclusive of seed money and unsettled fees and expenses, there are 16 contracts totaling \$96,617,750 that are included as non-insulated. Total separate account assets of the Company are \$52,592,632,278 at December 31, 2023. These 16 non-insulated contracts represent 0.18% of the Company's separate account balance at December 31, 2023. Given the immateriality of the balances, we are disclosing the existence of these 16 non-insulated contracts, but are not preparing a separate green book blank.									
1.01E9999 Total Life Insurance	1,340,457,118	1,881,171,004	XXX						1,881,171,004
1.01F9999 Totals	9,446,257,529	43,146,374,747	XXX	137,913,382					43,146,374,747

1.02 Did the reporting entity remit seed money, other fees and expenses or additional required surplus amounts to the general account during the current year? Yes [ ] No [ X ]

1.03 If yes, provide information on the total gross amount of seed money, other fees and expenses or additional required surplus amounts remitted to the general account during the current year (these amounts should not be reflected in the seed money totals in 1.01):

1.031 Seed Money.....\$ .....

1.032 Other Fees and Expenses.....\$ .....

1.033 Additional Required Surplus Amounts ..\$ .....

1.04 Did the reporting entity receive seed money from the general account in the current year? Yes [ ] No [ X ]

1.05 If yes, provide information on the total gross amount of seed money received in the current year: (If amounts were both received and remitted in the current year, include the gross amounts in both 1.031 and 1.051.)

1.051 Seed Money Received.....\$ .....

1.06 Does the reporting entity consider any of the seed money reflected in separate accounts to be insulated from the general account? Yes [ ] No [ X ] N/A [ ]

1.07 If yes, provide information on the amount of seed money the reporting entity considers insulated from the general account:

1.071 Insulated Seed Money .....\$ .....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**GENERAL INTERROGATORIES**

- 1.08 Does the reporting entity have a policy for repatriating seed money or remitting fees and expenses due and additional required surplus amounts to the general account:
- |  |                                               |                                                                     |
|--|-----------------------------------------------|---------------------------------------------------------------------|
|  | 1.081 Seed Money.....                         | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
|  | 1.082 Other Fees and Expenses.....            | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
|  | 1.083 Additional Required Surplus Amounts ... | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |

- 1.09 Provide detail on the time duration for which seed money, other fees and expenses due to the general account and additional required surplus amounts have been held in the separate account:

	1 Seed Money	2 Fees and Expenses Due to the General Account	3 Additional Required Surplus Amounts
1.091 Under 1 Year .....			
1.092 1 Year - 3 Years .....	137,913,382		
1.093 Over 3 Years - 5 Years .....			
1.094 Over 5 Years .....			
1.095 Total	137,913,382		

- 1.10 For seed money, other fees and expenses, and additional required surplus amounts held in the separate account, does the reporting entity invest these funds in accordance with investment directives of the general account:
- |  |                                               |                                                                                                  |
|--|-----------------------------------------------|--------------------------------------------------------------------------------------------------|
|  | 1.101 Seed Money.....                         | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> |
|  | 1.102 Other Fees and Expenses.....            | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> |
|  | 1.103 Additional Required Surplus Amounts ... | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> |
- 1.11 If no, does the reporting entity have stated policy and procedure for the investment of seed money, other fees and expenses, and additional required surplus amounts that are retained with the separate account?
- |  |                                               |                                                                                                  |
|--|-----------------------------------------------|--------------------------------------------------------------------------------------------------|
|  | 1.111 Seed Money.....                         | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |
|  | 1.112 Other Fees and Expenses.....            | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |
|  | 1.113 Additional Required Surplus Amounts ... | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> |

**Separate Account Products with General Account Guarantees**

- 2.1 Does the reporting entity have products with guarantees provided by the general account? ..... Yes  No
- 2.2 Has the separate account collected amounts from the general account within the past five years related to separate account guarantees? ..... Yes  No
- 2.3 If yes, provide detail on these guarantees paid by the general account:

	1 Year	2 Amount
2.301 As of December 31, 2023 .....		\$ 7,745,692
2.302 As of December 31, 2022 .....		\$ 4,702,830
2.303 As of December 31, 2021 .....		\$ 2,638,376
2.304 As of December 31, 2020 .....		\$ 6,925,020
2.305 As of December 31, 2019 .....		\$ 8,183,620

- 2.4 To compensate the general account for the risk taken, for any separate account products with general account guarantees, does the separate account remit risk charges to the general account related to separate account guarantees? ..... Yes  No
- 2.5 If yes, identify the separate account products with risk charges that are remitted to the general account and whether the risk charge for that product is reviewed and opined upon:

1 Product Identifier with Risk Charges	2 Risk Charge Reviewed and Opined Upon	3 Name and Title of Individual who Provided Opinion on Risk Charges
2.5A00001 Pension Risk Transfer Group Annuities		
2.5B00001 All Other Group Annuities		
Separate Account Guaranteed Interest Contract .....	Yes .....	Vy Ho, FSA, MAAA, Head of Insurance Valuation and Apointed Actuary .....
Synthetic Guaranteed Interest Contract .....	Yes .....	Vy Ho, FSA, MAAA, Head of Insurance Valuation and Apointed Actuary .....
2.5C00001 Registered Index Linked Annuities Individual Annuities		
2.5D00001 All Other Individual Annuities		
Individual Variable Annuity .....	No; the risk charges associated with this product are reviewed for reasonableness and accuracy by the appropriate actuary, but no formal opinion on these product risk charges is required by the NAIC.	
Individual Immediate Variable Annuity .....	No; the risk charges associated with this product are reviewed for reasonableness and accuracy by the appropriate actuary, but no formal opinion on these product risk charges is required by the NAIC.	
2.5E00001 Life Insurance		

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

## GENERAL INTERROGATORIES

2.6 Provide detail on the risk charges paid to the general account related to separate account guarantees for the past five years:

	1 Year	2 Amount
2.601 As of December 31, 2023		\$ 95,707,388
2.602 As of December 31, 2022		\$ 97,398,789
2.603 As of December 31, 2021		\$ 95,307,042
2.604 As of December 31, 2020		\$ 103,722,568
2.605 As of December 31, 2019		\$ 104,346,980

**Investment Directive of Separate Account Activity**

- 3.1 Does the reporting entity have products classified within the separate account for which the investment directive is not determined by the contract holder? (Situations in which the investments directive mirrors the general account would not be considered determined by the contract holder; however, having the contract holder select an investment direction from multiple options would meet this criteria.) ..... Yes [ X ] No [ ]
- 3.2 If yes, if these investments would have been included in the general account, would the reporting entity have exceeded the investment limitations imposed on the general account? ..... Yes [ ] No [ X ] N/A [ ]
- 3.3 Provide detail on the separate account investment portfolio and state investment limitations. (This includes the combined separate account and general investments, excluding separate account assets with investment direction determined by the contract holder):

1 Investment Type	2 State Investment Limitation	3 Combined Investment (Separate and General Account)

**Allocation of Investment Proceeds of Separate Account Activity**

- 4.1 Does the reporting entity have separate account assets in which less than 100% of investment proceeds (net of contract fees and assessments) are attributed to a contract holder? (This should identify any situations where there is a ceiling on investment performance results.) ..... Yes [ X ] No [ ]
- 4.2 If yes, provide detail on the net investment proceeds that were attributed to the contract holder, transferred to the general account and reinvested within the separate account:

1 Product Identifier	2 Net Investment Proceeds	3 Attributed to Contract Holder	4 Transferred to General Account	5 Reinvested Within the Separate Account
4.2A00001 Pension Risk Transfer Group Annuities				
4.2A99999 Total Pension Risk Transfer Group Annuities				
4.2B00001 All Other Group Annuities				
Separate Account Guaranteed Interest Contract	...(1,190,109,104)	...(1,197,724,352)		7,615,248
Supplemental Account	1,432,969	1,432,969		
Non-guaranteed Retirement Services SIAs	...(4,602,755,055)	...(4,602,755,055)		
4.2B99999 Total All Other Group Annuities	(5,791,431,190)	(5,799,046,438)		7,615,248
4.2C00001 Registered Index Linked Annuities Individual Annuities				
4.2C99999 Total Registered Index Linked Annuities Individual Annuities				
4.2D00001 All Other Individual Annuities				
4.2D99999 Total All Other Individual Annuities				
4.2E00001 Life Insurance				
4.2E99999 Total Life Insurance				
4.2F99999 Totals	(5,791,431,190)	(5,799,046,438)		7,615,248

- 4.3 For items reinvested within the Separate Account, does the reporting entity invest these assets in accordance with investment directives of the general account? ..... Yes [ ] No [ X ] N/A [ ]
- 4.4 If no, does the reporting entity have a stated policy and procedure for the reinvestment of investment proceeds within the separate account? ..... Yes [ X ] No [ ] N/A [ ]
- 4.5 Did the reinvestment of investment proceeds within the separate account result with the company having a combined investment portfolio that exceeded the state investment limitations imposed on the general account? ..... Yes [ ] No [ X ] N/A [ ]



ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

## GENERAL INTERROGATORIES

**Measurement of Separate Account Assets**

5.1 Does the reporting entity report all separate account assets at fair value? ..... Yes  No

5.2 For items not reported at fair value, does the reporting entity report separate account assets at amortized cost, and/or under different measurement methods?  
 5.21 Amortized Cost ..... Yes  No   
 5.22 Other Measurement Methods..... Yes  No

5.3 If other measurement methods are used, provide explanation on these measurement methods.  
 .....

5.4 Identify the assets measured at fair value, amortized cost or another measurement method and the percentage of separate account assets measured under each measurement method:

Description	1 Amount	2 Percentage
5.41 Fair Value .....	\$ 52,592,632,278	100.0 %
5.42 Amortized Cost .....	\$ .....	%
5.43 Other Measurement Methods .....	\$ .....	%

5.5 For the assets not measured at fair value, provide a comparison of the reported value to current fair value and identify the unrealized gain or loss that would have been recorded if the assets had been reported at fair value:

1 Assets Held at Amortized Cost	2 Fair Value	3 Unrecorded Unrealized Gain/Loss
5.51... \$ .....	\$ .....	\$ .....

1 Assets Held at Other Measurement Method	2 Fair Value	3 Unrecorded Unrealized Gain/Loss
5.52... \$ .....	\$ .....	\$ .....

**Securities Lending Transactions Within Separate Accounts**

6.1 Does the reporting entity engage in securities lending transactions with separate account assets? ..... Yes  No

6.2 If yes, does the reporting entity have written policies and procedures for such transactions? ..... Yes  No  N/A

6.3 Does the reporting entity obtain approval, or otherwise provide notification to contract holders, regarding securities lending transactions that occur with separate account assets? ..... Yes  No  N/A

6.4 Are all securities lending transactions reported on balance sheet? ..... Yes  No  N/A

6.5 Provide a description of the reporting entity's securities lending transaction program, specifically identifying any variations from the securities lending transaction program administered by the general account.  
 .....

6.6 Provide detail on the current status of separate account transactions by separate account product:

6.61 Amount of any loaned securities within the separate account and the percentage of separate account assets lent  
 6.611 Amount ..... \$ .....  
 6.612 Percentage..... %  
 6.62 Identify whether securities lent are reported at book value or market value  
 6.621 Book Value ..... \$ .....  
 6.622 Market Value..... \$ .....

6.63 Detail on collateral received:

6.631 Aggregate Amount Collateral Received  
 6.6311 Open ..... \$ .....  
 6.6312 30 Days or Less..... \$ .....  
 6.6313 31 to 60 Days..... \$ .....  
 6.6314 61 to 90 Days..... \$ .....  
 6.6315 Greater than 90 Days..... \$ .....  
 6.6316 Total Collateral Received.... \$ .....

6.632 The aggregate fair value of all securities acquired from the sale, trade or use of the accepted collateral (reinvested collateral) ..... \$ .....

6.633 Narrative discussion about sources and uses of collateral:  
 .....

6.634 Collateral for transactions that extend beyond one year from the reporting date ..... \$ .....

6.7 For the reporting entity's security lending program state the amount of the following as December 31 of the current year:

6.71 Total fair value of reinvested collateral assets reported on Schedule DL, Parts 1 and 2 (Sum of Schedule DL, Parts 1 and 2, Column 5) ..... \$ .....  
 6.72 Total book/adjusted carrying value of reinvested collateral assets reported on Schedule DL, Parts 1 and 2 (Sum of Schedule DL, Parts 1 and 2, Column 6) ..... \$ .....  
 6.73 Total payable for securities lending reported on the liability page (Page 3, Line 14, Column 3) ..... \$ .....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

## GENERAL INTERROGATORIES

**FHLB Funding Agreements**

7.1 Does the reporting entity report Federal Home Loan Bank (FHLB) funding agreements within the separate account? ..... Yes [ ] No [ X ]

7.2 Provide detail on the elements that support the classification of FHLB funding agreements within the separate account  
.....

7.3 Provide detail regarding the FHLB funding agreements classified within the separate account:

1 Amount of FHLB Stock Purchased or Owned	2 Amount of Collateral Pledged to the FHLB	3 Total Borrowing or Funding Capacity Currently Available	4 Total Reserves Related to FHLB Agreements
\$ .....	\$ .....	\$ .....	\$ .....

7.4 For funding agreements within the separate account, provide a general description on the nature of the agreement, type of funding (lines of credit, borrowed money, etc) and intended use of funding.  
.....

**Reporting Differences Between GAAP and SAP Financial Statements (This disclosure is applicable to all reporting entities regardless if they file GAAP financial statements)**

8.1 Does the reporting entity file GAAP financial statements? ..... Yes [ ] No [ X ]

8.2 In accordance with the different separate account reporting requirements between GAAP (SOP 03-1) and statutory accounting, does the reporting entity have products that are classified within the separate account that were, or would have been if GAAP financial statements had been completed, required to be reported within the general account under GAAP financials? Pursuant to SOP 03-1, all of the following conditions must be met to receive separate account reporting classification under GAAP: ..... Yes [ X ] No [ ] N/A [ ]

- a. Legal Recognition - The separate account is legally recognized. That is, the separate account is established, approved, and regulated under special rules such as state insurance laws, federal securities laws, or similar foreign laws.
- b. Legally Insulated - The separate account assets supporting the contract liabilities are legally insulated from the general account liabilities of the insurance enterprise (that is, the contract holder is not subject to insurer default risk to the extent of the assets held in the separate account).
- c. Investment Directive - The insurer must, as a result of contractual, statutory, or regulatory requirements, invest the contract holder's funds within the separate account as directed by the contract holder in designated investment alternatives or in accordance with specific investment objectives or policies.
- d. Investment Performance - All investment performance, net of contract fees and assessments, must as a result of contractual, statutory, or regulatory requirements be passed through to the individual contract holder. Contracts may specify conditions under which there may be a minimum guarantee, but not a ceiling, as a ceiling would prohibit all investment performance from being passed through to the contract holder.

8.3 Identify all separate account products and identify whether each product was classified within a separate account for GAAP reporting purposes. (For non-GAAP filers, this disclosure should reflect whether the GAAP classification would have been the same if GAAP financials had been completed.) For products that were (or would have been) reported differently, identify which SOP 03-1 condition prevented separate account GAAP classification for that particular product.

1 Product Identifier	2 Same as GAAP / Condition that Requires GAAP General Account Reporting
Individual Variable Annuity .....	Same as GAAP .....
Individual Variable Universal Life .....	Same as GAAP .....
Group Variable Universal Life .....	Same as GAAP .....
Individual Immediate Variable Annuity .....	Same as GAAP .....
Corporate-owned Life Insurance .....	Same as GAAP .....
Non-guaranteed Retirement Services SIAs .....	Same as GAAP .....
Separate Account Guaranteed Interest Contract .....	GAAP GIA Classification due to Investment Performance .....
Synthetic Guaranteed Interest Contract .....	GAAP GIA Classification due to Investment Performance .....
Stable Value Bank-owned Life Insurance .....	GAAP GIA Classification due to Investment Performance .....
Supplemental Account .....	GAAP GIA Classification due to Investment Performance .....
.....	.....

Interest Maintenance Reserve

**N O N E**

Interest Maintenance Reserve - Amortization

**N O N E**

Asset Valuation Reserve - Default Component

**N O N E**

Asset Valuation Reserve - Equity Component

**N O N E**

Asset Valuation Reserve - Replications (Synthetic) Assets

**N O N E**

**OVERFLOW PAGE FOR WRITE-INS**

Additional Write-ins for Liabilities Line 16

	Current Year			Prior Year
	1 General Account Basis	2 Fair Value Basis	3 Total (Cols. 1 + 2)	4 Total
1604. Claims in course of settlement .....		(197,802)	(197,802)	(152,739)
1697. Summary of remaining write-ins for Line 16 from overflow page		(197,802)	(197,802)	(152,739)

## SCHEDULE A - VERIFICATION BETWEEN YEARS

Real Estate

1. Book/adjusted carrying value, December 31 of prior year .....
2. Cost of acquired:
  - 2.1 Actual cost at time of acquisition (Part 2, Column 6) .....
  - 2.2 Additional investment made after acquisition (Part 2, Column 9) .....
3. Current year change in encumbrances:
  - 3.1 Totals, Part 1, Column 13 .....
  - 3.2 Totals, Part 3, Column 11 .....
4. Total gain (loss) on disposals, Part 3, Column 18 .....
5. Deduct amounts received on disposals, Part 3, Column 15 .....
6. Total foreign exchange change in book/adjusted carrying value:
  - 6.1 Totals, Part 1, Column 15 .....
  - 6.2 Totals, Part 3, Column 13 .....
7. Deduct current year's other than temporary impairment recognized:
  - 7.1 Totals, Part 1, Column 12 .....
  - 7.2 Totals, Part 3, Column 10 .....
8. Deduct current year's depreciation:
  - 8.1 Totals, Part 1, Column 11 .....
  - 8.2 Totals, Part 3, Column 9 .....
9. Book/adjusted carrying value at the end of current period (Lines 1+2+3+4-5+6-7-8) .....
10. Deduct total nonadmitted amounts .....
11. Statement value at end of current period (Line 9 minus Line 10) .....

**NONE**

## SCHEDULE B - VERIFICATION BETWEEN YEARS

Mortgage Loans

1. Book value/recorded investment excluding accrued interest, December 31 of prior year .....
2. Cost of acquired:
  - 2.1 Actual cost at time of acquisition (Part 2, Column 7) .....
  - 2.2 Additional investment made after acquisition (Part 2, Column 8) .....
3. Capitalized deferred interest and other:
  - 3.1 Totals, Part 1, Column 12 .....
  - 3.2 Totals, Part 3, Column 11 .....
4. Accrual of discount .....
5. Unrealized valuation increase/(decrease):
  - 5.1 Totals, Part 1, Column 9 .....
  - 5.2 Totals, Part 3, Column 8 .....
6. Total gain (loss) on disposals, Part 3, Column 18 .....
7. Deduct amounts received on disposals, Part 3, Column 15 .....
8. Deduct amortization of premium and mortgage interest points and commitment fees .....
9. Total foreign exchange change in book value/recorded investment excluding accrued interest:
  - 9.1 Totals, Part 1, Column 13 .....
  - 9.2 Totals, Part 3, Column 13 .....
10. Deduct current year's other than temporary impairment recognized:
  - 10.1 Totals, Part 1, Column 11 .....
  - 10.2 Totals, Part 3, Column 10 .....
11. Book value/recorded investment excluding accrued interest at end of current period (Lines 1+2+3+4+5+6-7-8+9-10) .....
12. Total valuation allowance .....
13. Subtotal (Line 11 plus 12) .....
14. Deduct total nonadmitted amounts .....
15. Statement value of mortgages owned at end of current period (Line 13 minus Line 14) .....

**NONE**

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**SCHEDULE BA - VERIFICATION BETWEEN YEARS**

Other Long-Term Invested Assets

1. Book/adjusted carrying value, December 31 of prior year .....	1,652,403,929
2. Cost of acquired:	
2.1 Actual cost at time of acquisition (Part 2, Column 8) .....	
2.2 Additional investment made after acquisition (Part 2, Column 9) .....	1,057,117,677
3. Capitalized deferred interest and other:	
3.1 Totals, Part 1, Column 16 .....	
3.2 Totals, Part 3, Column 12 .....	
4. Accrual of discount .....	378
5. Unrealized valuation increase/(decrease):	
5.1 Totals, Part 1, Column 13 .....	133,410,469
5.2 Totals, Part 3, Column 9 .....	(4,483,226)
6. Total gain (loss) on disposals, Part 3, Column 19 .....	141,964,995
7. Deduct amounts received on disposals, Part 3, Column 16 .....	1,112,966,890
8. Deduct amortization of premium and depreciation .....	36,050
9. Total foreign exchange change in book/adjusted carrying value:	
9.1 Totals, Part 1, Column 17 .....	
9.2 Totals, Part 3, Column 14 .....	
10. Deduct current year's other than temporary impairment recognized:	
10.1 Totals, Part 1, Column 15 .....	
10.2 Totals, Part 3, Column 11 .....	
11. Book/adjusted carrying value at end of current period (Lines 1+2+3+4+5+6-7-8+9-10) .....	1,867,411,282
12. Deduct total nonadmitted amounts .....	
13. Statement value at end of current period (Line 11 minus Line 12) .....	1,867,411,282

**SCHEDULE D - VERIFICATION BETWEEN YEARS**

Bonds and Stocks

1. Book/adjusted carrying value, December 31 of prior year .....	50,553,625,973
2. Cost of bonds and stocks acquired, Part 3, Column 7 .....	13,065,065,575
3. Accrual of discount .....	20,431,552
4. Unrealized valuation increase/(decrease):	
4.1. Part 1, Column 12 .....	394,265,594
4.2. Part 2, Section 1, Column 15 .....	(287,472)
4.3. Part 2, Section 2, Column 13 .....	3,150,562,099
4.4. Part 4, Column 11 .....	2,303,108,956
5. Total gain (loss) on disposals, Part 4, Column 19 .....	(1,593,371,088)
6. Deduction consideration for bonds and stocks disposed of, Part 4, Column 7 .....	18,274,691,258
7. Deduct amortization of premium .....	13,572,193
8. Total foreign exchange change in book/adjusted carrying value:	
8.1. Part 1, Column 15 .....	
8.2. Part 2, Section 1, Column 19 .....	
8.3. Part 2, Section 2, Column 16 .....	
8.4. Part 4, Column 15 .....	
9. Deduct current year's other than temporary impairment recognized:	
9.1. Part 1, Column 14 .....	
9.2. Part 2, Section 1, Column 17 .....	
9.3. Part 2, Section 2, Column 14 .....	
9.4. Part 4, Column 13 .....	
10. Total investment income recognized as a result of prepayment penalties and/or acceleration fees, Note 5Q, Line 2 .....	(229,138)
11. Book/adjusted carrying value at end of current period (Lines 1+2+3+4+5-6-7+8-9+10) .....	49,604,908,599
12. Deduct total nonadmitted amounts .....	
13. Statement value at end of current period (Line 11 minus Line 12) .....	49,604,908,599

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**SCHEDULE D - SUMMARY BY COUNTRY**

Long-Term Bonds and Stocks OWNED December 31 of Current Year

Description		1 Book/Adjusted Carrying Value	2 Fair Value	3 Actual Cost	4 Par Value of Bonds
<b>BONDS</b>					
Governments (Including all obligations guaranteed by governments)	1. United States .....	2,490,554,591	2,490,554,591	2,747,404,302	2,873,595,394
	2. Canada .....				
	3. Other Countries	74,116,074	74,116,074	85,759,665	77,843,000
	4. Totals	2,564,670,665	2,564,670,665	2,833,163,967	2,951,438,394
U.S. States, Territories and Possessions (Direct and guaranteed)	5. Totals	8,043,360	8,043,360	9,309,600	6,595,000
U.S. Political Subdivisions of States, Territories and Possessions (Direct and guaranteed)	6. Totals	259,794	259,794	298,782	230,000
U.S. Special Revenue and Special Assessment Obligations and all Non- Guaranteed Obligations of Agencies and Authorities of Governments and their Political Subdivisions	7. Totals	1,930,972,735	1,930,972,735	2,070,465,662	2,092,875,218
Industrial and Miscellaneous, SVO Identified Funds, Unaffiliated Bank Loans, Unaffiliated Certificates of Deposit and Hybrid Securities (unaffiliated)	8. United States .....	9,592,941,991	9,592,941,991	10,491,383,138	10,575,691,065
	9. Canada .....	110,449,056	110,449,056	123,971,102	123,254,000
	10. Other Countries	572,493,783	572,493,783	628,038,566	629,467,777
	11. Totals	10,275,884,830	10,275,884,830	11,243,392,806	11,328,412,842
Parent, Subsidiaries and Affiliates	12. Totals				
	13. Total Bonds	14,779,831,384	14,779,831,384	16,156,630,817	16,379,551,454
<b>PREFERRED STOCKS</b>					
Industrial and Miscellaneous (unaffiliated)	14. United States .....	4,212,864	4,212,864	6,360,000	
	15. Canada .....				
	16. Other Countries				
	17. Totals	4,212,864	4,212,864	6,360,000	
Parent, Subsidiaries and Affiliates	18. Totals				
	19. Total Preferred Stocks	4,212,864	4,212,864	6,360,000	
<b>COMMON STOCKS</b>					
Industrial and Miscellaneous (unaffiliated), Mutual Funds, Unit Investment Trusts, Closed-End Funds and Exchange Traded Funds	20. United States .....	34,819,079,537	34,819,079,537	35,633,309,613	
	21. Canada .....	458,648	458,648	324,533	
	22. Other Countries	1,326,166	1,326,166	1,222,878	
	23. Totals	34,820,864,351	34,820,864,351	35,634,857,024	
Parent, Subsidiaries and Affiliates	24. Totals				
	25. Total Common Stocks	34,820,864,351	34,820,864,351	35,634,857,024	
	26. Total Stocks	34,825,077,215	34,825,077,215	35,641,217,024	
	27. Total Bonds and Stocks	49,604,908,599	49,604,908,599	51,797,847,841	

**SCHEDULE DA - VERIFICATION BETWEEN YEARS**

Short-Term Investments

	1	2	3	4	5
	Total	Bonds	Mortgage Loans	Other Short-term Investment Assets (a)	Investments in Parent, Subsidiaries and Affiliates
1. Book/adjusted carrying value, December 31 of prior year .....	45,729,103	45,729,103			
2. Cost of short-term investments acquired .....	590,125,995	590,125,995			
3. Accrual of discount .....	72,027	72,027			
4. Unrealized valuation increase/(decrease) .....					
5. Total gain (loss) on disposals .....	7,871,611	7,871,611			
6. Deduct consideration received on disposals .....	447,247,314	447,247,314			
7. Deduct amortization of premium .....					
8. Total foreign exchange change in book/adjusted carrying value .....					
9. Deduct current year's other than temporary impairment recognized .....					
10. Book/adjusted carrying value at end of current period (Lines 1+2+3+4+5-6-7+8-9) .....	196,551,422	196,551,422			
11. Deduct total nonadmitted amounts .....					
12. Statement value at end of current period (Line 10 minus Line 11)	196,551,422	196,551,422			

(a) Indicate the category of such assets, for example, joint ventures, transportation equipment:



ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**SCHEDULE DB - PART A - VERIFICATION BETWEEN YEARS**

Options, Caps, Floors, Collars, Swaps and Forwards

1. Book/adjusted carrying value, December 31, prior year (Line 10, prior year) .....	196,409,980
2. Cost paid/(consideration received) on additions:	
2.1 Current year paid/(consideration received) at time of acquisition, still open, Section 1, Column 12 .....	(9,869,955)
2.2 Current year paid/(consideration received) at time of acquisition, terminated, Section 2, Column 14 .....	(5,759,625) .....
.....	(15,629,580)
3. Unrealized valuation increase/(decrease):	
3.1 Section 1, Column 17 .....	(55,353,984)
3.2 Section 2, Column 19 .....	5,312,896 .....
.....	(50,041,088)
4. SSAP No. 108 Adjustments .....	
5. Total gain (loss) on termination recognized, Section 2, Column 22 .....	(24,036,215)
6. Considerations received/(paid) on terminations, Section 2, Column 15 .....	(22,451,840)
7. Amortization:	
7.1 Section 1, Column 19 .....	
7.2 Section 2, Column 21 .....	
8. Adjustment to the book/adjusted carrying value of hedged item:	
8.1 Section 1, Column 20 .....	
8.2 Section 2, Column 23 .....	
9. Total foreign exchange change in book/adjusted carrying value:	
9.1 Section 1, Column 18 .....	
9.2 Section 2, Column 20 .....	
10. Book/adjusted carrying value at end of current period (Lines 1+2+3+4+5-6+7+8+9) .....	129,154,937
11. Deduct nonadmitted assets .....	
12. Statement value at end of current period (Line 10 minus Line 11) .....	129,154,937

**SCHEDULE DB - PART B - VERIFICATION**

Futures Contracts

1. Book/Adjusted carrying value, December 31 of prior year (Line 6, prior year).....	
2. Cumulative cash change (Section 1, Broker Name/Net Cash Deposits Footnote - Cumulative Cash Change Column) .....	
3.1 Add:	
Change in variation margin on open contracts - Highly effective hedges	
3.11 Section 1, Column 15, current year minus .....	
3.12 Section 1, Column 15, prior year .....	
Change in variation margin on open contracts - All other	
3.13 Section 1, Column 18, current year minus .....	59,552,550
3.14 Section 1, Column 18, prior year .....	(32,371) .....
.....	59,584,921 .....
.....	59,584,921
3.2 Add:	
Change in adjustment to basis of hedged item	
3.21 Section 1, Column 17, current year to date minus .....	
3.22 Section 1, Column 17, prior year .....	
Change in amount recognized	
3.23 Section 1, Column 19, current year to date minus .....	59,552,550
3.24 Section 1, Column 19, prior year plus .....	(32,371)
3.25 SSAP No. 108 Adjustments .....	59,584,921 .....
.....	59,584,921
3.3 Subtotal (Line 3.1 minus Line 3.2) .....	
4.1 Cumulative variation margin on terminated contracts during the year (Section 2, Column 15) .....	(64,334,237)
4.2 Less:	
4.21 Amount used to adjust basis of hedged item (Section 2, Column 17) . .....	
4.22 Amount recognized (Section 2, Column 16) .....	(64,334,237)
4.23 SSAP No. 108 Adjustments .....	(64,334,237)
4.3 Subtotal (Line 4.1 minus Line 4.2) .....	
5. Dispositions gains (losses) on contracts terminated in prior year:	
5.1 Total gain (loss) recognized for terminations in prior year .....	
5.2 Total gain (loss) adjusted into the hedged item(s) for terminations in prior year .....	
6. Book/adjusted carrying value at end of current period (Lines 1+2+3.3-4.3-5.1-5.2) .....	
7. Deduct total nonadmitted amounts .....	
8. Statement value at end of current period (Line 6 minus Line 7) .....	

Schedule DB - Part C - Section 1 - Replication (Synthetic Asset) Transactions (RSATs) Open

**N O N E**

Schedule DB-Part C-Section 2-Reconciliation of Replication (Synthetic Asset) Transactions Open

**N O N E**

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**SCHEDULE DB - VERIFICATION**

Verification of Book/Adjusted Carrying Value, Fair Value and Potential Exposure of all Open Derivative Contracts

		Book/Adjusted Carrying Value Check
1.	Part A, Section 1, Column 14.....	129,154,937
2.	Part B, Section 1, Column 15 plus Part B, Section 1 Footnote - Total Ending Cash Balance .....	.....
3.	Total (Line 1 plus Line 2) .....	.....129,154,937
4.	Part D, Section 1, Column 6 .....	156,386,019
5.	Part D, Section 1, Column 7 .....	(27,231,082)
6.	Total (Line 3 minus Line 4 minus Line 5) .....	.....
		Fair Value Check
7.	Part A, Section 1, Column 16 .....	129,154,937
8.	Part B, Section 1, Column 13 .....	.....
9.	Total (Line 7 plus Line 8) .....	.....129,154,937
10.	Part D, Section 1, Column 9 .....	156,386,019
11.	Part D, Section 1, Column 10 .....	(27,231,082)
12.	Total (Line 9 minus Line 10 minus Line 11) .....	.....
		Potential Exposure Check
13.	Part A, Section 1, Column 21 .....	25,558,330
14.	Part B, Section 1, Column 20 .....	35,974,925
15.	Part D, Section 1, Column 12 .....	61,533,255
16.	Total (Line 13 plus Line 14 minus Line 15) .....	.....

ANNUAL STATEMENT FOR THE YEAR 2023 OF THE SEPARATE ACCOUNTS OF THE Massachusetts Mutual Life Insurance Company

**SCHEDULE E - PART 2 - VERIFICATION BETWEEN YEARS**

(Cash Equivalents)

	1 Total	2 Bonds	3 Money Market Mutual funds	4 Other (a)
1. Book/adjusted carrying value, December 31 of prior year .....	675,551,046	562,146,024	113,405,022	
2. Cost of cash equivalents acquired .....	12,243,817,203	8,936,087,906	3,307,729,297	
3. Accrual of discount .....	768,328	768,328		
4. Unrealized valuation increase/(decrease) .....				
5. Total gain (loss) on disposals .....	18,326,764	18,326,764		
6. Deduct consideration received on disposals .....	12,408,319,849	9,163,355,094	3,244,964,755	
7. Deduct amortization of premium .....				
8. Total foreign exchange change in book/adjusted carrying value .....				
9. Deduct current year's other than temporary impairment recognized .....				
10. Book/adjusted carrying value at end of current period (Lines 1+2+3+4+5-6-7+8-9) .....	530,143,492	353,973,928	176,169,564	
11. Deduct total nonadmitted amounts .....				
12. Statement value at end of current period (Line 10 minus Line 11)	530,143,492	353,973,928	176,169,564	

(a) Indicate the category of such investments, for example, joint ventures, transportation equipment: