American Academy of Actuaries[1] Actuarial Opinion and Memorandum (AOM) Discussion Group

Improving the Communication of Issues within the Appointed Actuary's Memorandum

This report is a summary of the work of the AOM Discussion Group ("the Group") and is presented to the actuarial profession for the purpose of further discussion and the development of additional ideas. While this report does not include any recommendations for changes to current requirements, it offers these ideas to facilitate further consideration and discussion of ways to implement these ideas – either through actuarial practice or through proposals by others for changes. At the least, it is hoped that this report will result in further and more open communication between appointed actuaries and regulatory actuaries. While the AOM Discussion Group is open to receiving input from actuaries, and other interested stakeholders on these issues, the expectation is that such comments will become part of an on-going dialogue amongst actuaries.

The first few sections of this report are intended as background. There is pertinent information in these sections, but those wishing to skip to the discussion of ideas can go directly to the section marked *Discussion Topics and Presentation of Ideas* and the Appendices.

Background – Purpose of the Group

The purpose of the AOM Discussion Group is to discuss ideas for improving communication between appointed actuaries and regulatory actuaries of key issues covered in the actuarial memorandum supporting the actuarial opinion (i.e., the actuarial memorandum required and/or referenced by the National Association of Insurance Commissioners (NAIC) Standard Valuation Law (SVL), the NAIC Model Actuarial Opinion and Memorandum Regulation, and section VM-30 of the Valuation Manual).

The focus has been on how the content of the memorandum is communicated rather than on the content itself. It is not the mission of the AOM Discussion Group to propose any changes to the current requirements of the memorandum content.

[1] The American Academy of Actuaries is an 18,000-member professional association whose mission is to serve the public and the U.S. actuarial profession. The Academy assists public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

In addition, the AOM Discussion Group has facilitated open discussion on actuarial opinion and memorandum issues at past actuarial profession meetings[2] and the hope is these discussions will provide a framework for sessions at future actuarial meetings.

Background – Academy Discussion Group vs. Work Group

The AOM Discussion Group was formed by the Life Practice Council of the American Academy of Actuaries (LPC) to facilitate discussions between company appointed actuaries and the regulatory actuaries that review their work.

The structure of this group is somewhat different from a traditional LPC Work Group, which is typically charged with developing a consensus position and/or recommendation regarding a specific issue. The AOM Discussion Group was not formed with a charge to develop a position or a recommendation, and nothing in this report should be considered a consensus position or recommendation of the AOM Discussion Group.

Background – Additional Comments on the Origins of these Discussions

Anecdotally it was made known to the Academy that several appointed actuaries have expended considerable effort over the years to improve the content of their actuarial memorandum, sometimes with input from various (mostly their domestic/domiciliary) insurance department actuaries. Some of these appointed actuaries have added and/or enhanced sections dealing with issues they believe are important to them or their company, and they consider these sections as helpful in understanding these issues and the work performed in support of the actuarial opinion. One example is a section that discusses the major risks associated with various blocks of business and how those risks were analyzed as part of the asset adequacy analysis supporting the opinion. Another example is a section that discusses how the appointed actuary arrived at the opinion on reserve adequacy and/or what actions were taken to assure a "clean" opinion (such as the how/where/why of holding additional reserves). The appointed actuaries involved in these examples believe these enhancements have resulted in memoranda that are more comprehensive and contain useful information.

The downside of this developmental work is that the resulting memoranda are lengthy (e.g., 200+ pages), and it may be very difficult for reviewing actuaries to find the information that is important to them. Several regulatory actuaries have expressed this challenge to be the case. This especially is true for some actuaries including regulatory actuaries that are charged with reviewing memoranda from a large number of companies, and the difficulty is further exacerbated by the fact that different appointed actuaries typically use vastly different formats and structures for their memoranda. Regulatory actuaries have also indicated concerns about the quality of the information presented by some (but not all) companies.

In addition, there have been recent discussions at the NAIC Life Actuarial Task Force (LATF) to address some of these concerns by proposing a requirement for additional summary information to be included in the Regulatory Asset Adequacy Issues Summary (RAAIS) through the proposed VM-30 section of the Valuation Manual.

[2] The 2012 and 2013 Society of Actuaries' Valuation Actuary Symposiums.

While this does not represent a consensus or position of the AOM Discussion Group, some appointed actuaries have expressed concerns during the Group's discussions about the proposal for additional summary information within VM-30. These concerns include:

- The additional work associated with summarizing information in the memorandum, especially when added to:
    - the effort already expended in developing the memorandums;
    - challenges with resources;
    - responding to inquiries from multiple insurance departments; and
    - other priorities.
- The potential for misinterpretation of summary information provided without explanation about how that information was developed (e.g., "false positives/false negatives"); and
- The overall potential that this proposal could create additional obstacles in the sharing of information between appointed actuaries and regulatory actuaries (i.e., some may do the "bare bones" minimum within their RAAIS in response to increased requirements rather than attempting to address the underlying concerns).

In addition, during the Group's discussions that any change to the current requirements would take several years to implement due to the need to either make changes to each state's Actuarial Opinion and Memorandum Regulation (AOMR) or to complete the adoption of the Valuation Manual (VM). By discussing ideas to improve communication of key issues, the AOM Discussion Group is attempting to enhance current practice in implementing the existing requirements more immediately by encouraging actuaries to voluntarily improve that implementation.

It is important to note, however, that the focus of the Group is to attempt to further enhance the open lines of communication between appointed actuaries and regulatory actuaries. Practice can most effectively be improved if each party understands the needs and concerns of the other. The result of the discussions is that the members of the AOM Discussion Group better understand each other's perspectives and concerns. The Group's members believe this understanding will facilitate finding common ground on how to better communicate information in the memorandum and to improve actuarial practice in this area.

Discussion Topics and Presentation of Ideas

After several months of discussion of the underlying issues referenced above, the AOM Discussion Group formed three subgroups to better focus attention on specific ideas to improve the communication of key issues covered in the actuarial memorandum. As noted above, neither the AOM Discussion Group nor any of these three subgroups are recommending a specific course of action. These ideas are presented to facilitate further consideration and discussion of ways to implement these ideas.

The following is a summary of the three subgroups:

- **Consolidation and Standardization of Actuarial Memoranda Subgroup** – This subgroup is discussing ways to consolidate various required annual actuarial reports into one report. The subgroup is seeking to find ways to improve communication by minimizing multiple submissions and to avoid duplication of information. The subgroup has discussed consolidating general assumptions that are consistent across all blocks of business (i.e., that do not vary by regulation or Actuarial Guideline requirements) into one section of a report.

This could be combined with approaches identified by the Subgroup on Adding Links to the Actuarial Memorandum for Key Issues (see below). For example, a company could establish layers of electronic reports, with summary information in a top layer and detailed reports and common data in lower layers. This would necessitate that appointed actuaries discuss this approach with regulatory actuaries (primarily the regulator from the company's home jurisdiction, but perhaps also regulators from other jurisdictions interested in reviewing the company) to assure that the approach is consistent with current requirements. Appendix 1 of this report provides more details.

- **Executive Summary Subgroup** – This subgroup is discussing ways in which additional information could help regulatory actuaries better understand and gain confidence in the analysis performed by the appointed actuary. The focus is on developing a framework to better communicate what key issues affect an actuarial opinion. The AOM Discussion Group notes that the ideas for additional information can be obtained in several ways. One example discussed is an enhanced RAAIS. This tool would help the regulatory actuaries determine whether to request the full actuarial memorandum. Another example discussed is a summary section in the actuarial memorandum. This idea could be combined with ideas to add links in the memorandum – the reader could use the summary section to more easily find the detailed information supported by the summary. Appendix 2 of this report provides more detail.
- **Adding Links to the Actuarial Memorandum for Key Issues Subgroup** – This subgroup is discussing ideas on ways to improve communication of results by creating an actuarial memorandum template that incorporates links and bookmarks. Examples include:
  - A table of contents that links to major section headings;
  - "Items of Interest" links that send the reader to major memoranda topics (e.g., AG 43 analysis, stochastic testing, and mortality assumptions); and
  - A brief Executive Summary with links to key topics.

  The subgroup is also discussing the creation of a reserve template that promotes standardization across companies and time periods. Appendix 3 of this report provides more details.

  ***Note**: It is possible that the links below may not work properly in this consolidated AOM Discussion Group report on all systems. To download a working copy of the Actuarial Memorandum with links, please click on this link.*

Additional Consideration

One idea that the AOM Discussion Group discussed and that may warrant additional consideration (again, without recommending a specific course of action) is the electronic submission of the memorandum. This can be implemented in a manner where the domestic state receives the memorandum and non-domiciliary states receive either the RAAIS or the executive summary discussed herein. This may require support from the NAIC or even the use of an FTP ("file transfer protocol") site. This could be useful even if the other ideas in this report are not pursued. There would need to be access constraints such that an insurance department could only access companies licensed to do business under its jurisdiction. Additionally, confidentiality issues may need to be addressed.

Consolidation and Standardization of Actuarial Memorandum Subgroup

The following summary for this subgroup suggests ways to consolidate the various required annual actuarial reports into one report. The subgroup seeks to find ways to improve communication by minimizing multiple submissions and avoiding duplication of information. As the reader considers these ideas for improving communication, it is important to determine whether the implementation of any these ideas will require revision to the current regulatory requirements (e.g., the NAIC Model AOMR or VM-30). A final goal of this subgroup is to incorporate these suggestions into one document that builds on the "linked" Actuarial Opinion Memorandum (AOM) shown in Appendix 3.

Ideas for improving communication:

1. Consolidate various required annual actuarial reports into one report to minimize multiple submissions and avoid duplication of information.
   a. Create a suggested format to facilitate rapid retrieval of desired information by actuaries, regulators and management. The format should have sufficient flexibility to recognize differences between companies. A "straw man" suggested format is included at the end of this appendix.
   b. Consider adding a summary of the most pertinent parts of the Actuarial Opinion and Memorandum, either as part of an Executive Summary or within the RAAIS. This can include the "Items of Interest" list found in Appendix 3, but it can also include a summary of information required by applicable regulations and/or Actuarial Guideline (e.g., AG 38, AG 43, or Model Regulation 830). This can provide regulators with a way to find this information.
   c. Include an index of reserve exhibits by applicable regulation and/or Actuarial Guideline.
   d. Consolidate general assumptions for statutory reserves which are consistent across all lines of business and do not vary by regulation or Actuarial Guideline requirements into one section of the report. The goal would be to avoid repeating assumptions that had previously been provided. A database of company assumptions could be internally maintained, showing assumptions that have not changed and those that have. The table of contents for the assumptions could indicate if a change has occurred year over year. It might be useful to include the last year each assumption was updated. It also makes sense to include a summary of the key assumptions that have been revised in the current year.
   e. Consider ways the regulator could retain each insurer's product/assumptions/other data in databases, to the extent issues involving confidentiality can be addressed. This could provide a path to only including a summary of assumptions that have been revised in the current year, as opposed to including all of the assumptions in each year's memorandum.
   f. Consider providing a presentation of average/range of assumptions and results in the memorandum, with reference to previously submitted information.
   g. Include independent reserve sections (e.g., AG43, AG33, AG38, Model Regulation 830, C3P1, C3P2, preferred mortality, etc.) that contain material which is not duplicative.
2. Include an Executive Summary, either within the actuarial memorandum or the required RAAIS, with items of interest (as discussed above) for submission to non-domiciliary states.

This information can be used to assess whether to request (or access) the full memorandum. States that support this idea can request this summary instead of the RAAIS.

3. Establish layers of electronic reports, with summary information in the top layer, and detailed reports and common data in separate layers. Sample linked documents could be provided as starting templates.
4. Password-protect access (e.g., for State Departments of Insurance) to actuarial memoranda to preserve confidentiality, minimize cost of transmission (mail), and obviate regulator obligation to return documents. If this is managed by the NAIC, regulator access, to address confidentiality, could be controlled; for example, by providing limited time password with notification to companies when a state has requested access.

Note: There are numerous ways in which companies can enhance communication in their Actuarial Memoranda. The following format, which is used in Appendix 3, is one such example.

Example of a Format

1. LINKS TO ITEMS OF INTEREST
2. EXECUTIVE SUMMARY
3. BACKGROUND AND SCOPE
    - OVERVIEW OF BUSINESS
    - ASSET ADEQUACY ANALYSIS
    - REINSURANCE ARRANGEMENTS
    - SURPLUS
    - CHANGES FROM PRIOR YEAR
        a. COMPANY
        b. BUSINESS
        c. MODELS
        d. ASSUMPTIONS
4. LIABILITIES
    - OVERVIEW
    - PRODUCT DESCRIPTION AND RESERVE BASIS
    - LIABILITY ASSUMPTIONS
    - REINSURANCE CEDED
    - REINSURANCE ASSUMED
    - OTHER RISKS
5. ASSETS
    - OVERVIEW
    - ASSETS INCLUDED
    - ASSET MODEL AND ASSET PROJECTION ASSUMPTIONS
6. METHODOLOGY AND PROJECTIONS OF CASH FLOWS
    - METHODOLOGY
    - PROJECTION OF INSURANCE CASH FLOWS
    - PROJECTION OF INVESTMENT CASH FLOWS

7. BASIS FOR ASSET ADEQUACY ANALYSIS
    - CASH FLOW TESTING
    - OTHER METHODS
    - NOT TESTED
8. SOURCE OF IN-FORCE DATA
    - SOURCES OF IN-FORCE DATA
9. SUMMARY OF RESULTS
    - FORMULA RESERVES AND RELATED ITEMS
    - ADDITIONAL RESERVES
    - OTHER SIGNIFICANT CHANGES FROM PRIOR YEAR
    - CHANGES AFTER PROJECTION DATE
10. DISCUSSION OF RESULTS AND RISKS
11. CONCLUSION
12. APPENDICES
    - APPENDIX A -12/31/2012 RESERVES AND LIABILITIES
    - APPENDIX B -09/30/2012 RESERVES AND LIABILITIES
    - APPENDIX C –ASSETS
    - APPENDIX D -SCENARIOS
    - APPENDIX E -ASSUMPTIONS
    - APPENDIX F -MODEL VALIDATION
    - APPENDIX G -MARKET VALUE OF SURPLUS RESULTS (INCLUDING SENSITIVITY TESTS)
    - APPENDIX H -BOOK INCOME AND SURPLUS RESULTS
    - APPENDIX I -RAAIS

Executive Summary Subgroup

This is an example of a document to implement some of the ideas discussed by the Executive Summary Subgroup. This document could take several forms. For example, this could be an enhanced Regulatory Asset Adequacy Issues Summary (RAAIS), which could be used to help the regulatory actuaries determine whether to request the full actuarial memorandum. Another example would be to use this as a summary section in the actuarial memorandum. Either of these forms could include a table of contents and links that allows the reader to more easily find the information they need to review.

XYZ Life Insurance Company Executive Summary - 12/31/2013

Summary

The following are some highlights of this Summary. Each is described in greater detail in the body of this report.

- Due to large interim deficiencies within the Whole Life block from projection year 15 to year 40 under the base line scenario, additional reserves of $13.83 million were held for the 12/31/2013 statutory statement.
- On the base line (level) scenario, the company's Book Value (BV) of ending assets was over $50 million.
- Stochastic testing generated some negative results but the mean result, a 75th percentile measure and a CTE 60 standard were all positive for the company.
- In mid-2013, XYZLIC acquired a block of 10-year convertible Term insurance from ABC Life Insurance Company.

I. Description of Liabilities Analyzed

A. Product Descriptions *[Alternatively, this section can be shortened to simply list the products and discuss any unusual features that may be of concern to the appointed actuary.]*

1. Whole Life

Traditional whole life insurance covering a single insured life. Inforce includes policies issued from 1929 thru the valuation date. Minimum nonforfeiture values and reserves are based on the appropriate commissioner's table for the year of policy issue.

2. Endowment

Common 30-year endowment insurance covering a single insured life. Inforce policies issued from 1993 thru 2008; the product was not available for new sales after 2008. Minimum nonforfeiture values and reserves are based on the appropriate commissioner's table for the year of policy issue.

3. Term Insurance

Traditional term life insurance covering a single insured life. Level premium periods of 10, 15, 20, 25 and 30 years. Inforce policies issued from 1993 thru the valuation date. Reserves are based on the appropriate commissioner's table for the year of policy issue.

Ten-year convertible term insurance covering a single insured life. Policies are convertible at the end of the 10 year term period into any whole life insurance plan then offered by XYZLIC. Inforce policies issued from 2006 thru July 2013. This block was acquired by XYZLIC in mid-2013. No additional sales are contemplated. Reserves are based on the appropriate commissioner's table for the year of policy issue.

B. Options within the Liabilities

The convertible term block allows policy holders to exchange their contract, without evidence of insurability, for a whole life policy at the end of the term period. This presents an anti-selection mortality risk to XYZLIC which is appropriately funded through a load on the term insurance premium.

C. Changes from Prior Year

XYZLIC acquired a block of 10-year convertible term insurance in mid-2013. That block was subject to cash flow testing and is incorporated into the Term product line results.

II. Description of Assets Analyzed

A. Asset Portfolio *[Alternatively, this section can be shortened to simply list the asset classes analyzed and discuss any unusual features that may be of concern to the appointed actuary. If the company has separate account assets, this section may need to include a discussion of those separate accounts, especially if there are non-unitized separate accounts.]*

1. Overview

XYZLIC had total assets of $821.94 million as of 12/31/2013. Assets used in the study included bonds, preferred stocks, mortgages and short-term investments.

Assets are held in specific segments for each product line of business. Each asset segment has its own asset investment and reinvestment strategy which reflects the liability characteristics of the segment.

Invested assets are predominantly of high quality and are broadly diversified across asset class, individual credit, industry and location.

Asset allocation is determined based on cash flow and the specific risk/return needs of the product lines.

2. Bonds

Bonds were $402.86 million at 12/31/2013. This is $45.57 million or 12.8% higher than the $357.29 million at 12/31/2012. This increase was due to new policy sales and the reduction in mortgages (noted below). Public bonds accounted for 63.4% of the bond portfolio at 12/31/2013 vs. 71.4% as of 12/31/2012. XYZLIC increased its holdings of private bonds in order to generate increased yield and favorable protective covenants.

Fully 87.5% of the bond portfolio is rated NAIC-1 or NAIC-2 as of 12/31/2013 compared to 90.3% as of 12/31/2012. Of the below investment grade bonds, approximately 80.1% and 81.0% respectively for 12/31/2013 and 12/31/2012, were secured by either real estate or other assets in a senior debt position.

Average return on the bond portfolio was 5.83% with a duration of 4.8 years as of 12/31/2013. The comparable return for 12/31/2012 portfolio was 5.97% with a duration of 4.5 years.

3. Preferred Stocks

Preferred stocks were $13.37 million at 12/31/2013. This is $1.05 million or 8.5% higher than the $12.32 million at 12/31/2012. XYZLIC increased its position in high-quality, dividend-paying preferred stocks in light of the continuing low interest rate market.

4. Mortgages

Mortgage investments were $108.55 million at 12/31/2013. This is $70.30 million or 39.3% lower than the $178.85 million at 12/31/2012. As part of its long-term strategy to reduce real estate exposure, XYXLIC sold an office building and its associated parking ramp in 2013 for $54.32 million and $10.12 million respectively.

5. Cash, Cash Equivalents and Short-Term Investments

Cash & Short-Term Investments were $12.31 million at 12/31/2013. This is $2.34 million or 23.5% higher than the $9.97 million at 12/31/2012. Fluctuations in this balance are possible from period to period due to settlement of payables and receivables.

6. Other Invested Assets

Derivatives were $284.85 million at 12/31/2013. This is $38.21 million or 15.5% higher than the $246.64 million at 12/31/2012. Of the amounts at 12/31/2013, $176.40 million is unrealized gains on interest swaps that do not receive hedge accounting treatment and $108.45 million is foreign currency gains on currency swaps.

B. Investment Reserves

The Interest Maintenance Reserve (IMR) as of 12/31/2013 was negative $1.34 million. The actual statutory reserve was $0 as negative balances are non-admitted. None of XYZLIC's Asset Valuation Reserve (AVR) was used to determine asset adequacy. The balance of the AVR at 12/31/2013 was $4.56 million.

C. Options within the Assets

In general, XYZLIC acquires assets that either forbid early redemption or allow it subject to economic, "make whole" provisions. Approximately 9.3% of the assets as of 12/31/2013 allow the issuer to redeem prior to maturity at par (or as a percentage over par).

D. Changes from Prior Year

The continued and planned reduction in XYZLIC's exposure to real estate is reflected in decrease in the mortgage portfolio. No new asset types were introduced in 2013. Asset investment and reinvestment strategy remains unchanged from prior years.

III. Additional Reserves Required to Produce a "Clean" Opinion

A. Amount

An additional $13.83 million of reserves with respect to the Whole Life block were held for the 12/31/2013 statutory statement.

B. Criteria

Although XYZ's Whole Life block ultimately passed cash flow testing at the end of the projection period and XYZ's assets are sufficient for all periods when viewed on a total company basis, large interim deficiencies within the Whole Life block from projection year 15 to year 40 under the base line scenario were a cause for concern. Assets were added and the valuation was rerun on an iterative basis until the maximum interim deficiency for the stand-alone Whole Life block of business was less than 10% of the present value of the future liabilities for all interim periods.

The criteria for determining asset adequacy for reserves subject to cash flow testing analysis was based on a standard such that the Book Value (BV) of the assets assigned to each block of business was, at all times, sufficient to fund the maturing liabilities and current expenses of that business. The analysis was projected forward from the valuation date until such a time when the remaining liabilities were either non-existent or negligible.

Scenarios in which assets were sufficient to carry the liabilities to the end of the projection period were deemed to have "passed." I, as the Appointed Actuary, determined that asset adequacy would be met if the base line scenario "passed" and if three of the remaining NY7 scenarios would also "pass." In addition, I required that a CTE 60 standard be met with respect to the stochastic scenarios.

I am of the opinion that with the additional amounts noted below, reserves for XYZLIC are sufficient as of 12/31/2013.

IV. Asset Adequacy Results

A. Scenario Results 2013 *[This section shows results on a book value of ending surplus basis. The appointed actuary may wish to discuss with their domestic regulator what basis (e.g., market vs. book value, and present vs. ending value) makes the most sense.]*

[Insert Book Value of Ending Surplus Table Here]

B. Scenario Results Differences from Prior Year

Total company base line results were up slightly (4%) vs. prior year due primarily to the increase in the starting yield curve. Deterministic scenarios, aside from the initial yield curve, were the same as in the prior study; results in 2013 were marginally better on most of these scenarios. With respect to the stochastic scenarios, maximum values were up significantly while minimum, mean and standard deviation remained almost identical.

Term results were lower across the board due to the mid-2013 acquisition of a block of 10-year convertible Term insurance. Other product level results were substantially the same as in the prior study.

C. Interim Results *[If the company writes Universal Life with Secondary Guarantee (ULSG) products, this may be an appropriate place to discuss interim results for those products, as required by the RAAIS in the current NAIC model AOMR.]*

Interim period results were reviewed for asset sufficiency. For the combined company, XYZ had no interim deficiencies under the base line or any of the deterministic scenarios. Of the stochastic scenarios, 12% showed interim deficiencies. Most of these deficiencies appeared 15 or more years into the projection and were not material in amount.

At a product level, XYZ's Endowment and Term blocks of business had no interim deficiencies under the base line scenario. However, the Whole Life line generated base line scenario deficiencies starting in year 15 and continuing for many years of the projection.

D. Analysis

Total company results were projected for 50 years; at that time, liabilities were less than 1.3% of the initial liabilities. On the base line (level) scenario, the company's Book Value (BV) of ending assets was over $50 million.

Results of tests for changes in investment yields, lapses and mortality showed similar positive results for the total company. Stochastic testing generated some negative results but the mean result, a 75th percentile measure and a CTE 60 standard were all positive for the company.

The Whole Life line of business ended its 75 year projection period with positive BV of assets for most scenarios. However, scenarios with investment yields 100 bps or more lower than those at the valuation date showed interim results with a shortfall in the BV of assets. Subsequent tests were run with additional assets added to the Whole Life line.

The relatively small Endowment block was not very sensitive to economic changes over its 30 year projection period. As noted, this block was closed to new sales in 2008 and at that time, reserves were increased substantially. It is not surprising that projected results are uniformly positive.

Term insurance results were relatively insensitive to changes in investment rates but displayed poorer results when lapses decreased. A special scenario (#21 – level term lapse) where lapses at the end of the level term period were reduced by half, was run and analyzed. Results under this scenario, while lower, still generated a positive BV of assets for all years of the projection.

V. Other Changes from Prior Year

A. External Environment

Investment returns moved up slightly over those seen in the prior year. This generally improved asset adequacy for all of XYZ's lines of business. On the basis of the base line (or level scenario), results for the 2013 valuation are almost 5% higher than results in the prior year. Default experience while greatly improved had a minimal impact on cash flow testing results.

B. Company

In mid-2013, XYZLIC acquired a block of 10-year convertible Term insurance from ABC Life Insurance Company. This block represents approximately 15,000 contracts issued from 2006 thru 2013. Total face amount is $156 million with a reserve of $2.65 million.

C. Cash Flow Testing Model

The model was updated in 2013 to run each Term policy until the end of its remaining level term period. In prior year's analysis, all Term policies (of whatever level term period and current duration) were analyzed over a standard 30 year time horizon. This change was reviewed and it was determined that the difference in results was not material.

No other changes to the model were made from 2012 to 2013.

The model was updated in 2013 to run each Term policy until the end of its remaining level term period. In prior year's analysis, all Term policies (of whatever level term period and current duration) were analyzed over a standard 30 year time horizon. This change was reviewed and it was determined that the difference in results was not material.

No other changes to the model were made from 2012 to 2013.

D. Major Assumptions

XYZ's cash flow testing assumptions for 2013 remain unchanged from those used in the 2012 study. Initial interest rate yield curves reflect the specific Treasury rates as of the valuation date in each study.

_____ _____

Joe Smith, FSA, MAAA Date
Appointed Actuary
XYZ Life Insurance Company

Adding Links to the Actuarial Memorandum for Key Issues Subgroup

This subgroup discussed ideas on ways to improve communication of results by creating an actuarial memorandum template incorporating links and bookmarks. An example of a "linked" actuarial memorandum is below. ***Note****: It is possible that the links below may not work properly in this consolidated AOM Discussion Group report. To download a working copy of the Actuarial Memorandum with links, please click on this link.*

Please go to the next page to begin reviewing the sample, linked actuarial memorandum.

FOR ILLUSTRATION PURPOSES ONLY

ACTUARIAL MEMORANDUM

for

THE PRESIDENT AND CHIEF OPERATING OFFICER

of

ABC LIFE INSURANCE COMPANY

Developed by John Q. Actuary

In support of the December 31, 2012

STATEMENT OF ACTUARIAL OPINION

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

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Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

1. Links to Items of Interest

(TofC or IofI)

- Executive Summary
- Scenarios-Descriptions
- Scenarios-Rates
- NY 7
- Stochastic Tests
- Deterministic Tests
- Assets and Liabilities Tested
- Additional Reserves
- Sensitivity Testing

- Liability Assumptions-Mortality
- Liability Assumptions-Lapse
- Liability Assumptions-Substandard
- Liability Assumptions-Mortality Improvement

- RAAIS
- Asset Assumptions-Existing Assets
- Asset Assumptions-Investment Expenses
- Asset Assumptions-Reinvestment
- Assets Assumptions-Spreads
- Assets Assumptions-Defaults

- Surplus (PV of ending)
- Reinsurance
- Options and Derivatives
- Mean Reversion
- Moderately Adverse
- Validation (Dynamic and Static)
- AG 43, AG 38, PBR

2. Executive Summary

(TofC or IofI)

This is a summary of the 2012 results for the liabilities of ABC Life Insurance Company. It should be noted, there are no material changes in methods, procedures, or assumptions from prior year's analysis.

The present value of market value of surplus amounts as of September 30, 2012 for the stochastic and deterministic scenarios for all reasonable scenarios and sensitivities are sound. Although five of the seven deterministic scenarios produced a negative surplus amount, we believe that these are beyond moderately adverse scenarios. The main driver of the negative surplus amounts is due to low asset returns being earned on the assets versus the credited rates.

Due to credited rates in excess of current asset earned rates, the ULSG policies reserves were deemed to be deficient, and, therefore, additional reserve of $XX,XXX were required.

Interest Rate Results - In most scenarios, the company was unable to earn the full 48 basis points of target spread on the general account portion of the deferred annuities over the life of the business.

Expense Results - The expense risk was considered to be immaterial since expenses were tied directly to the account values and reserves. An agreement between ABC and BBST ameliorates this risk because fund operating fees and expenses move in tandem with the account values.

Surrender and Withdrawal Results - Surrenders of funds due to full surrenders and partial withdrawals on the deferred annuities were higher than what was assumed. This resulted in lower account values and less interest credited on the general account.

Separate Account Fund Performance Results - Varying separate account fund returns caused volatility in the amount of earnings produced by our equity index annuity contracts. This volatility impacted mortality and expense fees collected and guaranteed minimum death benefits paid.

Fund Transfer Results - In these extremely low interest rates periods, the company did not earn its target spread on general account funds due to the 1% credit rate floor. Also, fund transfers occurred immediately following the substantial increase in market rates caused strain on the company's target spread.

Mortality Results - Annuitants are living longer than was assumed in the reserve assumptions underlying the payout annuities, which resulted in mortality losses. This was also seen in the return of premium death benefit provision.

Asset Default and Reinvestment Results – Because the company was not subject to default or rating downgrade, we did not see reduced investment returns that the company achieves on normally earns for these portfolios. Expected default rates were extremely low as all of the existing assets as well as the all the reinvestment assets were Treasury securities or cash.

3. Background and Scope

(TofC or IofI)

Overview of Business

This memorandum encompasses the statutory reserves and liabilities of ABC Life Insurance Company.

ABC Life Insurance Company ("ABC") is a stock insurance company engaged in the business of writing annuities. ABC is a wholly owned subsidiary of XYZ Company.

ABC writes equity index annuities and ULSG policies. The majority of the reserves and liabilities of ABC are reinsured to LMN Reinsurance company on a coinsurance basis. This memorandum focuses on amounts retained, which as of December 31, 2012 consisted of the following amounts.

Product	Reserves 12/31/2012	Analysis
EAI – Separate Account –retained	[redacted]	CFT
ULSG	[redacted]	DC
Total	[redacted]	

Note: CFT = cash flow testing; DC = documented conservatism.

{Text Here}.

Asset Adequacy Analysis

As noted above, asset adequacy analysis in the form of cash flow testing was performed on the $[redacted] block of retained equity index annuities and the $[redacted] block of retained payout annuities. Testing was performed using September 30, 2012 asset and liability data in support of the December 31, 2012 Statement of Actuarial Opinion. In my opinion, use of the prior period data is reasonable and no material subsequent events have occurred that would invalidate the analysis on which the opinion is based.

Cash flow testing was performed for 5,000 stochastic scenarios that test a broad range interest rate and equity return scenarios. The 5,000 stochastic scenarios were developed by vendor software and produced to meet the C-3 Phase 2 calibration points. Testing was also performed for the seven interest rate scenarios ("required seven") described in Oregon Insurance Department Regulation 126. I considered some of these seven scenarios to be extreme scenarios. Additional testing was also performed for three

deterministic yield curve steepening and inversion scenarios that test the impact of various interest rate levels and yield curve shapes.

Additional testing was performed to analyze the sensitivity of results to various other assumption changes.

There have been no significant changes to the analysis from last year. Past assumptions were reviewed and adjusted based on experience. Projection models were examined and refined where appropriate.

Reinsurance Arrangements

On July 1, 2010 LMN entered into a reinsurance agreement with ABC on all the rights, liabilities, and obligations except for contracts written in Oregon. The reinsurance is on a coinsurance basis for the non-Oregon general account and non-unitized separate account liabilities and on a modified coinsurance basis for the non-Oregon liabilities residing in the unitized separate accounts. Overall, LMN assumes about 50% of the total direct business. During 2012, the administration of LMN's equity index annuity business transitioned to JKL. Along with administration, Podunk assumed responsibility of calculating the reserves. The portion going to Podunk included the variable deferred and payout annuities from ABC and ABCNY. LMN retained the ULSG policies and a portion of the fixed payout business.

Surplus

This analysis considers adequacy of reserves and other liabilities assuming initial assets equal to reserves and liabilities. Surplus adequacy is not covered by this memorandum and no analysis of surplus was performed.

Changes from Prior Year

- *Company*
- *Business*
- *Models*
- *Assumptions*

4. Liabilities

(TofC or IofI)

Overview

The reserves and liabilities, net of reinsurance, as of 09/30/2012 were as follows:

Product	Reserves 9/30/2012
Equity index annuities– retained	[redacted]
ULSG Policies	[redacted]
Reserves in cash flow testing model	[redacted]
ULSG policies	[redacted]
Equity index annuities– Separate Account - Modco	[redacted]
Total	[redacted]

Summaries of the December 31, 2012 and September 30, 2012 reserves and liabilities are shown in Appendices A and B, respectively. These Appendices disclose which amounts were cash flow tested and which amounts were documented as conservative. As noted above, asset adequacy analysis in the form of cash flow testing was performed on the retained equity index annuities. Analysis in the form of documented conservatism was performed on the retained ULSG policies and on the equity index annuity reserves that are reinsured on a modified coinsurance basis.

Product Description and Reserve Basis

Premium payments made under the flexible premium deferred equity index annuity contracts are allocated to unitized separate accounts or a fixed interest rate segment in the general account. For the fixed account, interest rates are reset periodically based on existing asset yields and current market rates. The fixed account has a minimum guaranteed interest rate of 3%. The separate account contains no principal or interest guarantees. The contractholder bears the investment risk for all amounts allocated to the separate accounts.

A surrender charge may be assessed against surrenders of purchase payments. The charge is assessed against premium payments and begins at 15% and grades down to 10% after 3 years. No surrender charges are assessed in the event of death, total disability before age 65, nursing home confinement, or terminal illness prognosis. Additionally, during the surrender charge period, the charge is waived for withdraws up to 12% of prior purchase payments each year. All contracts are now beyond the surrender charge period. The minimum allowed partial surrender is $1500.

The contracts offer annuitization (payout) options which include, but are not limited to, life, certain and continuous, joint, and variable payments. For fixed options, the guaranteed minimum purchase rates are based on the 1983 "a" table at 3% interest. All equity index annuity contracts contain a minimum guaranteed death benefit ("GMDB") feature. The death benefit is the greater of (1) the account value on the date of notice of death or (2) a return of premiums less withdrawals to date (i.e. 100% of all premium payments made under the contract, reduced by the dollar amount of any partial surrenders since the date of issue).

There are no transfer or withdrawal fees. An annual maintenance charge of $115 applies but is waived for account values of $500,000 or more. The minimum contract size is $22,000. The separate account mortality, expense, and administration fee totals 15 basis points. Annual portfolio operating expenses are also assessed against the funds and range from approximately 3 basis points to 22 basis points depending on the underlying fund.

The reserves for the flexible premium equity index annuities are determined using Actuarial Guideline 43 (VACARVM). For 2012 year-end, Standard Scenario Amount is greater than the CTE70 amount. For the Basic Adjusted Reserve in the Standard Scenario Amount calculation, interest rates vary from 2.15% to 6.00% and mortality is either under the 1983 Table "a" or the Annuity 2000 table.

Included in this memorandum is a description of the 2012 standalone asset adequacy analysis performed on the equity index annuity business.

The retained payout annuities were all a result of the annuitization of deferred annuities and all resided in the general account. The annuities are certain only, life contingent, or certain and continuous annuities. The reserve basis included discount rates ranging from 2.00% to 11.00% and mortality based on either under the 1983 GAM table, or the Annuity 2000 table.

Liability Assumptions

- Mortality
- Lapses
- Substandard
- Mortality Improvement

Reinsurance Ceded

Reinsurance Assumed

Other Risks

5. Assets

(TofC or IofI)

Overview

The company invests in cash and Treasury securities.

The statutory statement value of assets has been determined in compliance with NAIC requirements.

Assets Included

1. Cash and Short-Term Investments – SSAP No. 2.
2. Bonds – SSAP No. 26. Generally amortized cost using the scientific (constant yield) interest method.

Derivatives
Options

Market values of assets were determined in order to project gains and losses upon sale. Market values for bonds were calculated by discounting the expected security flows at projected market rates.

The general account and separate account assets as of September 30, 2012 have similar characteristics to the assets as of December 31, 2012. Appendix C contains the assets as of 9/30/2012 by maturity, credit quality, and sector. Note that much of this memorandum applies to "credit" assets whereas current and modeled reinvestment assets for this company, ABC Life, are cash and Treasury securities.

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Asset Model and Asset Projection Assumptions

- Existing Assets
- Investment Expenses
- Reinvestment Assumptions
- Spreads
- Defaults

6. Methodology and Projections of Cash Flows

(TofC or IofI)

Methodology

Equity index annuity and fixed payout annuity monthly insurance and investment cash flows were projected using the Consulting Firm system from September 30, 2012 until a significant portion of the business had fully matured. Positive cash flows during this period were invested in a weighted average of two-year and five-year Treasury bonds. This generally kept the duration of the assets within the target duration range the company manages this business to. Borrowing at the 90-day Treasury rate plus 25 basis points up to 12% of assets covered negative cash flows. Once borrowing exceeds 12%, assets are sold to cover negative cash flow.

The Asset Valuation Reserve (AVR) as of September 30, 2012 was [redacted]. This was excluded from the cash flow testing. The Interest Maintenance Reserve (IMR) as of September 30, 2012 was [redacted]. An IMR amount of [redacted] was modeled in cash flow testing as an estimate of the portion of the IMR attributable to the reserves and liabilities (versus surplus). Future changes to the IMR were modeled but such that the balance never became negative.

Note that an additional reserve of $[redacted] was established by the company to ensure asset adequacy for these business blocks.

Validation of the CF model consisted of validating the initial input items (static validation) as well as the first few years of projected results (dynamic validation). The dynamic validation compared expected amounts with modeled amounts. Comparison to recent actual results was not performed due to the very small number of policyholders in the company and the variability caused by margins in the assumptions and census changes. (e.g. The equity index annuity projections use a conservative 1% lapse rate whereas recent lapse rates have been closer to 0.5% so a comparison of recent actual experience to projected would provide limited value. On a similar note, there were eight policyholders in fixed payout annuities but only six of them were in the prior year actual results.) The validation results are contained in Appendix F.

The market value of surplus results were determined by accumulating the excess of the investment cash flows over the insurance cash flows for each scenario to the end of the projection period and discounting that result back to September 30, 2012 using the post-tax portfolio yield rates for that scenario. The conservatism in the assumptions and the impact of possible actions by company management (e.g., changing non-guaranteed elements) were also considered.

Appendix D summarizes the stochastic and deterministic yield curves and equity returns used in the projections. Mean reversion …

The ULSG policies were not modeled in CF. These contracts were modeled in Microsoft Excel by accumulating the current account value by the credited rate to maturity and then discounting it back to the valuation date by using conservative portfolio earned rates. The reserves were below these discounted values and an additional reserve of $[redacted] was established to ensure asset adequacy for these contracts.

Projection of Insurance Cash Flows

Insurance cash flows projections reflected surrenders, withdrawals, mortality, and expenses. Due to the small size of this block of business, experience studies provide limited information. The surrender, withdrawal, and mortality assumptions chosen are based on experience from other larger blocks of business. The impact of significant changes in these assumptions has been analyzed through sensitivity tests discussed below and in Appendix G-1 and G-2.

The following is a description of the key assumptions. Similar information on the assumptions is contained in Appendix E.

Credited Rates

Current credited rates were used for inforce business and future credited rates were assumed to be equal to the asset earned rates less an expected spread of 100 basis points, subject to guaranteed minimums (1.5%) as defined in each contract.

Separate Account Fund Performance

Fund performance was modeled under 5,000 stochastic interest rate and Separate Account return scenarios. In addition, ten deterministic scenarios, which included the required seven scenarios, were analyzed. In the deterministic scenarios, the separate account assets were illustrated at a conservative growth rate of 1.75% before assessment of all mortality, expense, administration, and fund operating fees. It was lowered to 1% for a sensitivity test.

Fund Transfers and Subpays

Fund transfers and subpays (i.e. future premium deposits) were not modeled in the base runs but the potential impact was examined in the sensitivity testing. See Appendix E for more discussion.

Mortality, Expense Administration, and Fund Operating Fees

ME&A fees were set at 20 basis points per year, consistent with the actual contractual charges. Fund operating fees vary between 25 and 115 basis points per year and an average of 62 basis points was assumed in the modeling.

The managers of the separate account funds provide ABC with revenue sharing ranging up to 12.5 basis points of the fund values per year. This revenue item has been excluded from this analysis.

Expenses

Investment expenses of 16 basis points per year for the general account are included in the projections. Annual general insurance expenses were set at 25 basis points of the account values. Fund operating Expenses were assumed to be equal to 25 basis points per year (thereby offsetting the projected fund operating fees).

The company incurs sizable (relative to reserves and liabilities) insurance department expenses for licenses and fees. The company would incur these expenses even in the absence of inforce business as it wants to maintain a viable "shell" that is licensed in many states. Such expenses have been excluded from the analysis.

Surrender and Withdrawal Rates

Surrenders of funds were assumed to equal 10% of the fund values per year for the deferred annuities. This assumption covers full surrenders and partial withdrawals. Given recent experience, the limited death benefit, and the fact that the business is beyond the surrender charge period, an annual rate of 10% was used. See Appendix E for information on recent experience.

Mortality

Mortality was assumed to follow the statutory reserve basis for the payout annuities (Annuity 2001 or 1983 Table "a"). Mortality for the deferred annuities was modeled using Annuity 2010 table.

Death Benefits

As noted above, the guaranteed minimum death benefit is the greater of the account value and a return of premium. GMDB risk is included in the projection.

VI. Annuitization Benefits

Future annuitizations were not modeled in the analysis of the deferred equity index annuity contracts as it was assumed that the value of annuitization to the contract holder would be less than that of a full surrender. Historically this option has had a very low level of election. (The $[redacted] asset adequacy reserve is assumed to cover this risk as well).

The benefit payments for payout annuities were projected based on the contractual payments, with mortality based on the underlying statutory valuation table.

Federal Income Tax

The Federal Income Tax rate was set at 35% and applied to the taxable income in each projection year.

Projection Period

Insurance cash flows were projected for 45 years until all material benefits were paid.

Projection of Investment Cash Flows

Investment cash flows were projected on a seriatim basis. Cash flows included coupon payments and scheduled payments of principal. Default and call assumptions were not applicable as all existing assets, as well as modeled future reinvestment assets, were cash and Treasury securities.

Net cash flows were assumed to be reinvested at an interest rate varying by scenario, and within scenario, by year. A month's cash flow, if positive, was invested in a bucket of bonds comprised of 55% 3-year treasury securities and 45% 15-year treasury securities. If the cash flow was negative, it was borrowed at 100 basis points above the 90-day Treasury rate up to 12% of assets. Once borrowing exceeds 12%, assets are sold to cover negative cash flow. The impact of active portfolio management has been reflected in the cash flows.

7. Basis for Asset Adequacy Analysis

(TofC or IofI)

Cash Flow Testing

Other Methods

Not Tested

8. Source of In-force Data

(TofC or IofI)

Sources of In-force Data

For the September 2012 analysis, data were received from LMN and Podunk as of September 30, 2012. No adjustments or modifications have been made to this data. I have not verified the accuracy of the data but reviewed it for reasonableness and have no reason to believe that any material defects are present.

9. Summary of Results

(TofC or IofI)

Formula Reserves and Related Items

- AG 43
- AG 38
- PBR

Additional Reserves

Other Significant Changes from Prior Year

Changes After Projection Date

10. Discussion of Results and Risks

(TofC or IofI)

Analysis consisted of examining various items associated with each scenario, including, but not limited to, the present value of the ending market value of surplus, the incidence of cash flows, and the retained statutory book surplus resulting from the cash flow testing at interim periods.

There are no material changes in methods, procedures, or assumptions from prior year's asset adequacy analysis.

Appendix G - 1 shows the present value of market value of surplus amounts and statistics as of September 30, 2012 for the stochastic and deterministic scenarios. Also included in Appendix G are results from sensitivity testing. Stochastic scenarios produced market value of surplus ranging from $([redacted]) to $[redacted] with mean $([redacted]) and standard deviation of $[redacted]. The 85th percentile was $([redacted]) and the 70th percentile was $([redacted]). These amounts do not include the additional reserve amount of $[redacted] for the equity index annuities.

Five of the seven "New York" deterministic scenarios produced a negative surplus amount. I believe some of the "New York" scenarios in which ABC have a negative surplus are beyond moderately adverse scenarios. I believe the stochastic scenarios are a better representation of the embedded risks. The main driver of the negative surplus amounts is due to low asset returns being earned on the assets versus the credited rates.

Appendix H summarizes the stochastic and deterministic statutory income and retained statutory book surplus resulting from cash flow testing at each calendar year-end for the first ten projection years and every fifth year thereafter. Note that the surplus shown in this appendix is based on the book value of assets and liabilities.

The ULSG policies reserves were deemed to be deficient, before the additional reserve of $[redacted]. These contracts are being credited rates in excess of the current asset earned rates. Appendix A includes the additional actuarial reserve of $[redacted].

Several sensitivity tests were performed to analyze the sensitivity of results to key risk. The following is a discussion of the key risks and the corresponding sensitivity tests. More detail can be found in Appendix G-1 and Appendix G-2.

Interest Rate Risk

Interest rate levels and movement can present several risks. In periods with low interest rates, the company may be unable to earn its expected spreads because of the guaranteed minimum credited rates in the contracts and the inherent credited rates in the payout annuities. In high interest rate environments, contract holders may opt to surrender their contract to achieve higher returns elsewhere.

This risk is captured in the results of the 5,000 stochastic scenarios and the ten deterministic scenarios as summarized in Appendix G-1. Both changing interest rate levels and the separate account returns cause the variability in the stochastic results. The deterministic scenarios isolate the sensitivity of the interest rate risk in that for these scenarios, the separate account returns are not varied by scenario. In most of scenarios, the company is unable to earn the full 48 basis points of target spread on the general account portion of the deferred annuities over the life of the business.

Expense Risk

Expense risk often occurs when expenses increase as a percentage of revenues. This risk is considered to be immaterial since expenses are tied directly to the account values and reserves. The agreement between ABC and Glenbrook stipulates that ABC pay a fee equal to 25 basis points of account value for deferred annuities and 15 basis points of reserves for payout annuities to administer the business. Fund operating fees and expenses also move in tandem with the account values.

Appendix G-2 includes a sensitivity test where expenses were increased from 50 basis points of account values/reserves to 60 basis points. Using deterministic scenario 1 as a base run, this decreased the market value of surplus from [redacted]) to [redacted]), a decrease of $[redacted]. See Appendix G-2, run 2.

Surrender and Withdrawal Risk

Surrenders of funds due to full surrenders and partial withdrawals on the deferred annuities may be higher than what is assumed in the base runs. This would result in lower account values and less interest credited on the general account, therefore more profit in a down interest rate scenario and less profit in an up interest rate scenario.

A sensitivity test was performed that assumed 300% lapse rates instead of the base 17% lapses. This increased the deterministic scenario 11 results from $([redacted]) to $([redacted]). The improvement is due to the embedded inadequacy of the reserves so a higher lapse rate improves the results. Results for this sensitivity test are also shown for the remaining deterministic scenarios. See Appendix G-2, run 3.

For further analysis, another sensitivity test was performed on the deferred annuities using 5,000 stochastic scenarios and assuming a 30% lapse rate. Under this test, the 85th percentile had increased surplus even though some extreme scenarios worsened.

Separate Account Fund Performance Risk

Varying separate account fund returns can cause volatility in the amount of earnings produced by the equity index annuity contracts. This volatility will impact, among other items, mortality and expense fees collected and guaranteed minimum death benefits paid. The range of the volatility can be seen in the results of the 5,000 stochastic scenarios shown in Appendix G-1.

To further assess this risk, additional deterministic scenarios were performed. One scenario assumed a flat 0% growth in the separate account. The market value of surplus

amounts was $([redacted]). Comparing these to deterministic scenario 1 which uses a level 0.5% separate account return, the change in surplus amounts were ($[redacted]). See Appendix G-2, run 4.

Fund Transfers

In periods of very low interest rates, the company may not earn its target spread on general account funds due to the 1% credit rate floor. A sensitivity test of putting 25% of the outstanding EIA liabilities into the general account was run to measure the fund transfer risk. This reduces the deterministic scenario 1 results from $([redacted]) to $([redacted]). I believe this scenario to be beyond what is considered moderately adverse. See Appendix G-2, run 1.

Fund transfers occurring immediately following a substantial increase in market rates can also cause strain on the company's target spread. A sudden substantial increase in market yields can cause unrealized losses in the underlying general account assets. Since participant transfers are on a book value basis, unrealized losses can become realized and may not be recouped in the future target spreads. This risk is analyzed in the lapse sensitivity where lapses were increased from 17% to 300%. This does overstate the impact in that when a transfer does occur, the asset still stay within the contract and the company collects future ME&A fees on these assets; Whereas in a lapse situation, the contract is terminated and no future fees are collected.

Mortality Risk

Mortality risk presents itself in the payout life contingent annuities and in the deferred annuities return of premium death benefit. Annuitants may live longer than is assumed in the reserve assumptions underlying the payout annuities, causing mortality losses. In the return of premium death benefit provision, if annuitants die and their net premiums received to date exceed their account value, the excess is paid by the general account.

A sensitivity test was performed by increasing the base mortality by 50%. This increased the deterministic scenario 1 results from $([redacted]) to $([redacted]). Results for this sensitivity test are also shown for the remaining deterministic scenarios. See Appendix G-2, run 5.

Asset Default and Reinvestment Risk

Assets held in the general account may be subject to default or rating downgrade. This can reduce the investment returns the company achieves on these portfolios, thereby lowering the expected spread the company will earn.

Expected default rates were not modeled as all of the existing assets as well as the modeled reinvestment assets were assumed to be Treasury securities or cash. Reinvestment risk is embedded within all of the modeled results.

11. Conclusion

(TofC or IofI)

In judging whether the results of cash flow testing were satisfactory, I examined various items of each scenario, including but not limited to the present value of ending market value of surplus, the incidence of cash flows, and the retained statutory book surplus resulting from the cash flow testing at interim periods. Although these items were examined for all the scenarios tested, more weight was given to the results of the 5,000 stochastic scenarios. Conservatism in the assumptions, the impact of possible actions by company management (e.g., changing non-guaranteed elements) and the results of sensitivity tests were also considered.

Some of the scenarios tested, including some of the sensitivity tests, contain assumptions that may be considered overly conservative. In forming my opinion, I considered these scenarios, but relied more heavily on the results of scenarios performed under moderately adverse conditions.

Note that while the cash flow model used in this analysis attempts to reflect the risks the company is exposed to and the dynamics of cash flows, it will still contain limitations because it is only a model. The analysis performed is based on the results derived from the application of the cash flow model over a wide range of interest rate and separate account fund performance scenarios (including many moderately adverse scenarios) while the actual needs of the company arise from the risks to which it is or will be exposed in reality. A cash flow scenario model can not completely quantify the company's exposure to risk. The model attempts to represent reality, but will always remain an approximation thereto and hence uncertainty in future experience is an important consideration when reviewing and relying upon the Statement of Actuarial Opinion.

A summary of the results, as described in Section 4, are shown in Appendix G-1. Results are shown for the 5,000 stochastic scenarios, the required seven scenarios, and three additional deterministic scenarios. Assets (after reflecting additional reserves the company established) were sufficient to pay claims and expenses in all market scenarios. Discussion of the key risks for the business can also be found in Section 4.

Additional sensitivity testing of various other assumptions was performed, as I deemed necessary. The results of this sensitivity testing are discussed in Section 4 and Appendix G-2 and did not cause me to alter my opinion.

Appendix H summarizes the statutory income and retained statutory book surplus at the end of each calendar year, for the first ten projection years and then every 5th year thereafter, resulting from the 5,000 stochastic scenarios, the seven required scenarios, and the three additional deterministic scenarios. Additional years were examined even though they aren't shown.

Actuarial methods, consideration and analyses used in the preparation of this memorandum conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board, which standards form the basis for this memorandum.

My examination included such review of the actuarial assumptions and actuarial methods and of the underlying basic liability records and such tests of the actuarial calculations, as I considered necessary.

2/1/2012	John Q. Actuary
Date	John Q. Actuary, FSA, MAAA President and Actuary ABC Life Insurance Company

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

12. Appendices

(TofC or IofI)

Appendix A –12/31/2012 Reserves and Liabilities

(TofC or IofI)

ABC Life Insurance Company
12/31/2012

		RESERVES AND LIABILITIES				
		ASSET ADEQUACY ANALYZED				
		(1)	(2)		(3)	(4)
		FORMULA	ADDITIONAL	ANALYSIS	OTHER	TOTAL
		RESERVES	ACTUARIAL	METHOD	AMOUNT	AMOUNT
STATEMENT ITEM			RESERVES			(1) + (2) + (3)
		($)	($)		($)	($)
EXHIBIT 5						
A	Life Insurance	-	-	CFT	-	-
A	Life Insurance	-	-	DC (ModCo)	-	-
A	Life Insurance	-	-	DC (other)	-	-
A	Life Insurance	-	-	IM	-	-
A	Life Insurance	-	-	N/A	-	-
B	Annuities	-	-	CFT	-	-
B	Annuities	-	-	DC (ModCo)	-	-
B	Annuities	-	-	DC (other)	-	-
B	Annuities	-	-	IM	-	-
B	Annuities	-	-	N/A	-	-
C	Supplementary Contracts ILC	-	-	CFT	-	-
C	Supplementary Contracts ILC	-	-	DC (ModCo)	-	-
C	Supplementary Contracts ILC	-	-	DC (other)	-	-
C	Supplementary Contracts ILC	-	-	IM	-	-
C	Supplementary Contracts ILC	-	-	N/A	-	-
D	Accidental Death Benefits	-	-	CFT	-	-
D	Accidental Death Benefits	-	-	DC (ModCo)	-	-
D	Accidental Death Benefits	-	-	DC (other)	-	-
D	Accidental Death Benefits	-	-	IM	-	-
D	Accidental Death Benefits	-	-	N/A	-	-
E	Disability - Active Lives	-	-	CFT	-	-
E	Disability - Active Lives	-	-	DC (ModCo)	-	-
E	Disability - Active Lives	-	-	DC (other)	-	-
E	Disability - Active Lives	-	-	IM	-	-
E	Disability - Active Lives	-	-	N/A	-	-
F	Disability - Disabled Lives	-	-	CFT	-	-
F	Disability - Disabled Lives	-	-	DC (ModCo)	-	-
F	Disability - Disabled Lives	-	-	DC (other)	-	-
F	Disability - Disabled Lives	-	-	IM	-	-
F	Disability - Disabled Lives	-	-	N/A	-	-
G	Miscellaneous Reserves	-	-	CFT	-	-
G	Miscellaneous Reserves	-	-	DC (ModCo)	-	-
G	Miscellaneous Reserves	-	-	DC (other)	-	-
G	Miscellaneous Reserves	-	-	IM	-	-
G	Miscellaneous Reserves	-	-	N/A	-	-
	TOTAL EXHIBIT 5 (Page 3, Line 1)	-	-		-	-
EXHIBIT 6						
A	Active Life Reserve	-	-	CFT	-	-
A	Active Life Reserve	-	-	DC (ModCo)	-	-
A	Active Life Reserve	-	-	DC (other)	-	-
A	Active Life Reserve	-	-	IM	-	-
A	Active Life Reserve	-	-	N/A	-	-
B	Claim Reserve	-	-	CFT	-	-
B	Claim Reserve	-	-	DC (ModCo)	-	-
B	Claim Reserve	-	-	DC (other)	-	-
B	Claim Reserve	-	-	IM	-	-
B	Claim Reserve	-	-	N/A	-	-
	TOTAL EXHIBIT 6 (Page 3, Line 2)	-	-		-	-
EXHIBIT 7						
2	Guaranteed Interest Contracts	-	-	CFT	-	-
2	Guaranteed Interest Contracts	-	-	DC (ModCo)	-	-
2	Guaranteed Interest Contracts	-	-	DC (other)	-	-
2	Guaranteed Interest Contracts	-	-	IM	-	-
2	Guaranteed Interest Contracts	-	-	N/A	-	-
3	Annuities Certain	-	-	CFT	-	-
3	Annuities Certain	-	-	DC (ModCo)	-	-
3	Annuities Certain	-	-	DC (other)	-	-
3	Annuities Certain	-	-	IM	-	-
3	Annuities Certain	-	-	N/A	-	-
4	Supplemental Contracts	-	-	CFT	-	-
4	Supplemental Contracts	-	-	DC (ModCo)	-	-
4	Supplemental Contracts	-	-	DC (other)	-	-
4	Supplemental Contracts	-	-	IM	-	-
4	Supplemental Contracts	-	-	N/A	-	-
5	Dividend Accumulations of Refunds	-	-	CFT	-	-
5	Dividend Accumulations of Refunds	-	-	DC (ModCo)	-	-
5	Dividend Accumulations of Refunds	-	-	DC (other)	-	-
5	Dividend Accumulations of Refunds	-	-	IM	-	-
5	Dividend Accumulations or Refunds	-	-	N/A	-	-
6	Premium and Other Deposit Funds	-	-	CFT	-	-
6	Premium and Other Deposit Funds	-	-	DC (ModCo)	-	-
6	Premium and Other Deposit Funds	-	-	DC (other)	-	-
6	Premium and Other Deposit Funds	-	-	IM	-	-
6	Premium and Other Deposit Funds	-	-	N/A	-	-
	TOTAL EXHIBIT 7 (Page 3, Line 3)	-	-		-	-

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

ABC Life Insurance Company 12/31/2012						
		RESERVES AND LIABILITIES				
		ASSET ADEQUACY ANALYZED				
		(1)	(2)		(3)	(4)
		FORMULA	ADDITIONAL	ANALYSIS	OTHER	TOTAL
		RESERVES	ACTUARIAL	METHOD	AMOUNT	AMOUNT
STATEMENT ITEM			RESERVES			(1) + (2) + (3)
		($)	($)		($)	($)
EXHIBIT 8 Part 1						
1	Life (P3 L4.1)	-	-	CFT	-	-
1	Life (P3 L4.1)	-	-	DC (ModCo)	-	-
1	Life (P3 L4.1)	-	-	DC (other)	-	-
1	Life (P3 L4.1)	-	-	IM	-	-
1	Life (P3 L4.1)	-	-	N/A	-	-
2	Health (P3 L4.2)	-	-	CFT	-	-
2	Health (P3 L4.2)	-	-	DC (ModCo)	-	-
2	Health (P3 L4.2)	-	-	DC (other)	-	-
2	Health (P3 L4.2)	-	-	IM	-	-
2	Health (P3 L4.2)	-	-	N/A	-	-
	TOTAL EXHIBIT 8, Part 1	-	-		-	-
SEPARATE ACCOUNTS						
	Aggregate Reserve (P3 L1)	-	-	CFT	-	-
	Aggregate Reserve (P3 L1)	-	-	DC (ModCo)	-	-
	Aggregate Reserve (P3 L1)	-	-	DC (other)	-	-
	Aggregate Reserve (P3 L1)	-	-	IM	-	-
	Aggregate Reserve (P3 L1)	-	-	N/A	-	-
	Liability for deposit-type contracts (P3 L2)	-	-	CFT	-	-
	Liability for deposit-type contracts (P3 L2)	-	-	DC (ModCo)	-	-
	Liability for deposit-type contracts (P3 L2)	-	-	DC (other)	-	-
	Liability for deposit-type contracts (P3 L2)	-	-	IM	-	-
	Liability for deposit-type contracts (P3 L2)	-	-	N/A	-	-
	TOTAL SEPARATE ACCOUNTS	-	-		-	-
OTHER LIABILITIES						
	Dividend Due & Unpaid (P3 L5)	-	-	CFT	-	-
	Dividend Due & Unpaid (P3 L5)	-	-	DC (ModCo)	-	-
	Dividend Due & Unpaid (P3 L5)	-	-	DC (other)	-	-
	Dividend Due & Unpaid (P3 L5)	-	-	IM	-	-
	Dividend Due & Unpaid (P3 L5)	-	-	N/A	-	-
	Dividend Liability (P3 L6.1)	-	-	CFT	-	-
	Dividend Liability (P3 L6.1)	-	-	DC (ModCo)	-	-
	Dividend Liability (P3 L6.1)	-	-	DC (other)	-	-
	Dividend Liability (P3 L6.1)	-	-	IM	-	-
	Dividend Liability (P3 L6.1)	-	-	N/A	-	-
	Dividends not yet apportioned (P3 L6.2)	-	-	CFT	-	-
	Dividends not yet apportioned (P3 L6.2)	-	-	DC (ModCo)	-	-
	Dividends not yet apportioned (P3 L6.2)	-	-	DC (other)	-	-
	Dividends not yet apportioned (P3 L6.2)	-	-	IM	-	-
	Dividends not yet apportioned (P3 L6.2)	-	-	N/A	-	-
	Advance Premiums (P3 L8)	-	-	CFT	-	-
	Advance Premiums (P3 L8)	-	-	DC (ModCo)	-	-
	Advance Premiums (P3 L8)	-	-	DC (other)	-	-
	Advance Premiums (P3 L8)	-	-	IM	-	-
	Advance Premiums (P3 L8)	-	-	N/A	-	-
	Prov. for Exp. Rating Refund (P3 L9.2)	-	-	CFT	-	-
	Prov. for Exp. Rating Refund (P3 L9.2)	-	-	DC (ModCo)	-	-
	Prov. for Exp. Rating Refund (P3 L9.2)	-	-	DC (other)	-	-
	Prov. for Exp. Rating Refund (P3 L9.2)	-	-	IM	-	-
	Prov. for Exp. Rating Refund (P3 L9.2)	-	-	N/A	-	-
	Reinsurance Payables (P3 L9.3)	-	-	CFT	-	-
	Reinsurance Payables (P3 L9.3)	-	-	DC (ModCo)	-	-
	Reinsurance Payables (P3 L9.3)	-	-	DC (other)	-	-
	Reinsurance Payables (P3 L9.3)	-	-	IM	-	-
	Reinsurance Payables (P3 L9.3)	-	-	N/A	-	-
	Borrowed Money(P3 L22)	-	-	CFT	-	-
	Borrowed Money(P3 L22)	-	-	DC (ModCo)	-	-
	Borrowed Money(P3 L22)	-	-	DC (other)	-	-
	Borrowed Money(P3 L22)	-	-	IM	-	-
	Borrowed Money(P3 L22)	-	-	N/A	-	-
	Reinsurance in unauthorized companies (P3 L24.02)	-	-	CFT	-	-
	Reinsurance in unauthorized companies (P3 L24.02)	-	-	DC (ModCo)	-	-
	Reinsurance in unauthorized companies (P3 L24.02)	-	-	DC (other)	-	-
	Reinsurance in unauthorized companies (P3 L24.02)	-	-	IM	-	-
	Reinsurance in unauthorized companies (P3 L24.02)	-	-	N/A	-	-
	Funds Withheld under Reinsurance Agreements (P3 L24.03)	-	-	CFT	-	-
	Funds Withheld under Reinsurance Agreements (P3 L24.03)	-	-	DC (ModCo)	-	-
	Funds Withheld under Reinsurance Agreements (P3 L24.03)	-	-	DC (Co-FW)	-	-
	Funds Withheld under Reinsurance Agreements (P3 L24.03)	-	-	IM	-	-
	Funds Withheld under Reinsurance Agreements (P3 L24.03)	-	-	N/A	-	-
	Drafts outstanding (P3 L24.05 in part)	-	-	CFT	-	-
	Drafts outstanding (P3 L24.05 in part)	-	-	DC (ModCo)	-	-
	Drafts outstanding (P3 L24.05 in part)	-	-	DC (other)	-	-
	Drafts outstanding (P3 L24.05 in part)	-	-	IM	-	-
	Drafts outstanding (P3 L24.05 in part)	-	-	N/A	-	-

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

ABC Life Insurance Company						
12/31/2012						
		RESERVES AND LIABILITIES				
		ASSET ADEQUACY ANALYZED				
		(1)	(2)		(3)	(4)
		FORMULA	ADDITIONAL	ANALYSIS	OTHER	TOTAL
		RESERVES	ACTUARIAL	METHOD	AMOUNT	AMOUNT
STATEMENT ITEM			RESERVES			(1) + (2) + (3)
		($)	($)		($)	($)
	Funds Held Under Coinsurance (P3 L24.07)	-	-	CFT	-	-
	Funds Held Under Coinsurance (P3 L24.07)	-	-	DC (ModCo)	-	-
	Funds Held Under Coinsurance (P3 L24.07)	-	-	DC (other)	-	-
	Funds Held Under Coinsurance (P3 L24.07)	-	-	IM	-	-
	Funds Held Under Coinsurance (P3 L24.07)	-	-	N/A	-	-
	Interest on Funds (P3 L25 in part)	-	-	CFT	-	-
	Interest on Funds (P3 L25 in part)	-	-	DC (ModCo)	-	-
	Interest on Funds (P3 L25 in part)	-	-	DC (other)	-	-
	Interest on Funds (P3 L25 in part)	-	-	IM	-	-
	Interest on Funds (P3 L25 in part)	-	-	N/A	-	-
	Provision for Future Div. (P3 L25 in part)	-	-	CFT	-	-
	Provision for Future Div. (P3 L25 in part)	-	-	DC (ModCo)	-	-
	Provision for Future Div. (P3 L25 in part)	-	-	DC (other)	-	-
	Provision for Future Div. (P3 L25 in part)	-	-	IM	-	-
	Provision for Future Div. (P3 L25 in part)	-	-	N/A	-	-
	TOTAL OTHER LIABILITIES	-	-		-	-
TOTAL RESERVES		-	-		-	-

Note:
CFT: Cash Flow Testing;
DC (ModCo): Documented Conservatism (reinsured on a ModCo basis);
DC (Co-FW): Documented Conservatism (reinsured on a Coinsurance Funds Withheld basis);
DC (other): Documented Conservatism (other than reinsured on a ModCo b

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix B –09/30/2012 Reserves and Liabilities
(TofC or IofI)

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix C –Assets
(TofC or IofI)

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix D –Scenarios
(TofC or IofI)

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix E –Assumptions
(TofC or IofI)

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix F –Model Validation
(TofC or IofI)

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix G –Market Value of Surplus Results (Including Sensitivity Tests)
(TofC or IofI)

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix H –Book Income and Surplus Results
(TofC or IofI)

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Appendix I –RAAIS
(TofC or IofI)

Descriptions of Scenarios Tested
Cash flow testing was performed using 5,000 stochastic monthly scenarios and the ten interest rate scenarios ("required seven") described in the 1990 NAIC Model Actuarial Opinion and Memorandum Regulation plus 3 deterministic yield curve steepening and inversion scenarios to test the impact of various interest rate levels and yield curve shapes. All scenarios began with the September 30, 2012 yield curve.

For 5000 stochastic scenarios, Consulting Firm system was used to generate interest rate, equity fund, and fixed income fund returns. The equity returns generated are consistent with the calibration criteria as outlined in the March 2006 *C3 Phase II Risk-Based Capital for Variable Annuities: Pre-Packaged Scenarios* issued by the American Academy of Actuaries' Life Capital Adequacy Subcommittee (AAA LCAS).

Summary statistics on the 5,000 stochastic and ten deterministic scenarios are attached in the Appendix G.

None of the scenarios produced negative surplus in aggregate for the company.

Sensitivities were performed for both the deterministic and stochastic scenarios as well as other assumptions such as lapses, withdrawals, mortality, expenses and asset default. The results did not cause me to alter my opinion.

Changes in Assumptions from Prior Year
Assumptions were reviewed and adjusted based on experience. In 2011, the lapse rate for Variable Annuity products was assumed to be 10% annually. Given market conditions at that time, this was higher than the prior 15 years' actual rates and resulted in a measure of conservatism. In 2012 due to market performance, the lapse rate was adjusted downward to be 15% annually as a lower lapse rate produced conservatism.

Product Lines and Associated reserves No Longer Analyzed
All product lines analyzed for the 2011 asset adequacy analysis were analyzed for the 2012 asset adequacy analysis.

Interim Results
There were no interim results in any of the scenarios tested that were of significant concern.

Reinsurance
For most products, the projected amount and timing of reinsurance cash flows were incorporated directly into cash flow testing.

Appendix 3 - **Adding Links to the Actuarial Memorandum for Key Issues Subgroup**

Embedded Options

I have verified that all material options affecting cash flows embedded in fixed income securities and equity-like features in any investments have been appropriately considered in asset adequacy analysis.