

GI FREU Model Solutions

Fall 2015

1. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

- (1a) Understand and apply the concepts of insurance accounting.
- (1b) Understand and compare different financial reporting standards for general insurers including: U.S. Statutory Account Principles (SAP), U.S. Generally Accepted Accounting Principles (GAAP), Canadian Generally Accepted Accounting Principles (CGAAP), Solvency II and International Financial Reporting Standards (IFRS).

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 9 (Measuring Total Income for General Insurers)
- Chapter 10 (Statutory Surplus, Capital and Income: Measuring Value and Performance)

Solution:

- (a) Compare the operating income perspective with the fair value perspective with respect to the measurement of general insurer total profits. Include the following for each perspective in your comparison:
 - (i) Elements included in the computation of underwriting income
 - (ii) Elements included in the computation of investment income
 - (iii) One disadvantage
 - (iv) One advantage

Commentary on Question:

The model solution includes two disadvantages and two advantages for parts (iii) and (iv). Only one of each for the two perspectives was required for full credit.

1. Continued

OIP = Operating Income Perspective, FVP = Fair Value Perspective

- (i) *Underwriting income from*
 - OIP: nominal premium and losses
 - FVP: fair value premium and losses
- (ii) *Investment income from*
 - OIP: underwriting transactions, and capital & surplus funds
 - FVP: excess investment yield on underwriting transactions and excess capital funds
- (iii) *Disadvantages*
 - OIP: Operating income depends on business growth rates that can distort profit in a reporting period.
 - OIP: Underwriting income mixes investment and underwriting risks.
 - FVP: There are disputes as to what is the appropriate rate for the discounting of unpaid losses.
 - FVP: Profit is not easily reconciled to the insurer's actual profit.
- (iv) *Advantages*
 - OIP: Simplicity of computation.
 - OIP: Reconciles to insurer's actual profit.
 - FVP: No distortion from business growth rates.
 - FVP: Separates the time value of money from random fluctuations.

- (b) Identify which perspective is used for the measurement of general insurer total profits in the NAIC Insurance Expense Exhibit.

Operating income perspective

- (c) Explain why economic accounting would show higher capital amounts for a company than U.S. statutory accounting.

Economic accounting has no accounting margins and losses are at present value whereas U.S. statutory accounting includes margins and losses are at nominal value.

- (d) Describe the adjustment(s) required to IFRS 4 capital to give market value capital.

Add franchise value for renewals and distribution systems.

2. Learning Objectives:

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

- (2c) Calculate and interpret the results of financial health ratios.
- (2i) Discuss the function of credit rating agencies and their impact on general insurers.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 13 (General Insurance Financial Ratings)

Solution:

- (a) Identify two qualitative attributes of an insurer that are typically examined by a rating agency during the interactive meetings between the rating agency and the insurer.

Commentary on Question:

The model solution includes a list of several attributes for illustrative purposes. This list is not comprehensive. Only two attributes were required for full credit.

- management structure
- underwriting expertise
- organizational structure
- capital structure

- (b) Explain why public data from an insurer is generally insufficient for a rating agency's quantitative analysis of the insurer.

Commentary on Question:

The model solution includes a list of three reasons for illustrative purposes. This list is not comprehensive. Two reasons were required for full credit.

- Reinsurance data in the Annual Statement lack detail with regard to individual treaties (e.g., attachment points, limits, and exclusions).
- Investment data in the Annual Statement lack detail especially with regard to derivative instruments.
- Schedule P data does not show the actuarial analysis of the reserves.

2. Continued

- (c) Explain why an insurer should not withhold data that may lower its financial rating from a rating agency when the data has not been requested by the rating agency.
- A rating agency evaluates the trustworthiness of the insurer.
 - Withheld data may come to light during the examination, or after the examination.
 - This could create a greater downgrade than with disclosure because the rating agency may then question the integrity of the insurer's management.
- (d) Compare the three A.M. Best liquidity ratios with respect to:
- (i) Assets included in the computation of the ratio, and
- (ii) What the ratio is intended to measure.
- (i) Quick - Investments quickly convertible to cash
Current - Unencumbered cash plus unaffiliated investments
Overall - Total admitted assets
- (ii) Quick - This measures the proportion of net liabilities covered by cash and investments expected to be converted to cash within a year.
Current - This measures whether the insurer's claims-paying ability depends on collecting premium balances and/or selling investments in affiliates.
Overall - This is a solvency ratio, not a liquidity ratio. It measures the reserves-to-surplus leverage ratio, not the liquidity of assets used to pay claims.

3. Learning Objectives:

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

- (2b) Understand and apply the elements of the NAIC RBC formula.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 12 (Solvency Monitoring)

Solution:

- (a) Calculate UPI's RBC ratio for 2014.

Commentary on Question:

The model solution shows the level of detail expected for full credit. It represents one approach to showing the steps in the calculation.

$$R_0 = 1.1, R_1 = 0.3, R_2 = 0.5, R_3 = 0.2 + 1.8 = 2.0$$

For reserve risk excess growth adjustment: factor is 45% applying to gross written premium growth rate in excess of 10% multiplied by net written premiums, on a line of business basis.

$$\begin{aligned} R_4 &= \text{reserve risk before excess growth adjustment} + \text{excess growth adjustment} \\ &= 2.3 + [(17\% - 10\%) \times 45\% \times 11.7] + [(11\% - 10\%) \times 45\% \times 0.8] \\ &= 2.3 + [0.369 + .004] \\ &= 2.673 \end{aligned}$$

Premium concentration factor = $0.7 + 30\%$ of [net written premium (latest year) for the line of business with the greatest amount divided by the total net written premium (latest year)].

$$\begin{aligned} \text{Written premium risk charge before excess growth adjustment} \\ &= \text{basic written premium risk charge} \times \text{premium concentration factor} \\ &= 3.1 \times [0.7 + (0.3 \times 7.8 / 11.3)] \\ &= 2.81 \end{aligned}$$

3. Continued

The written premium risk excess growth adjustment is calculated by line of business as 22.5% of the gross written premium growth rate in excess of 10% multiplied by net unpaid loss and loss adjustment expenses.

$$\begin{aligned}R_5 &= \text{written premium risk before excess growth adjustment} + \text{excess growth adjustment} \\ &= 2.81 + [(17\% - 10\%) \times 22.5\% \times 7.8] + [(11\% - 10\%) \times 22.5\% \times 3.5] \\ &= 2.941\end{aligned}$$

$R_4 > R_3$ so one needs to adjust R_4 and R_3 for credit risk from reinsurance recoverables

$$\begin{aligned}R_3 &\rightarrow 0.2 + 50\% \text{ of } 1.8 = 1.1 \\ R_4 &\rightarrow 2.673 + 50\% \text{ of } 1.8 = 3.573\end{aligned}$$

$$\begin{aligned}RBC &= R_0 + [R_1^2 + R_2^2 + R_3^2 + R_4^2 + R_5^2]^{0.5} \\ &= 1.1 + [0.3^2 + 0.5^2 + 1.1^2 + 3.573^2 + 2.941^2]^{0.5} \\ &= 5.892\end{aligned}$$

$$\text{RBC Ratio} = \text{total adjusted capital} / \text{ACL} = 5 / 0.5 \times \text{RBC} = 170\%$$

- (b) Explain what actions, if any, are indicated by the RBC ratio calculated in part (a) from UPI and the regulator.
- RBC ratio is at the Company Action Level (150% to 200%).
 - Company is to submit a plan to the insurance commissioner of the domiciliary state. The plan must explain how the company will obtain capital or reduce operations/risk exposure to meet RBC standards.
 - No action is required by the regulator.

4. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

- (1c) Describe the elements of the NAIC Annual Statement.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 5 (Accounting Perspectives for Non-Admitted Assets)
- Chapter 8 (Notes to Financial Statements)

NAIC Statement of Statutory Accounting Principles

- No. 3, “Accounting Changes and Corrections of Errors”
- No. 5 Revised, “Liabilities, Contingencies and Impairments of Assets”
- No. 62 Revised, “Property and Casualty Reinsurance”
- No. 65, “Property and Casualty Contracts”

Solution:

- (a) Describe one Annual Statement disclosure that is required for each of the following items as noted in the Statements of Statutory Accounting Principles:

- (i) Correction of material errors
- (ii) Estimated loss from the impairment of an asset where the amount of the loss cannot be reasonably estimated
- (iii) Structured settlements
- (iv) Reinsurance recoverables

Commentary on Question:

There are a number of disclosures required for each of (i) to (iv). The model solution shows only one of the required disclosures for each of (i) to (iv) as an example of a full credit solution.

- (i) A brief description including the reason and justification for the correction.
- (ii) The nature of the contingency and the estimated range of the loss or that an estimate (value or range) cannot be made.

4. Continued

- (iii) The amount of reserves no longer carried by the reporting entity because it has purchased annuities with the claimant as payee.
 - (iv) List each individual reinsurer and the unsecured aggregate recoverable pertaining to that reinsurer where the reinsurer's recoverables exceed 3% of policyholders' surplus.
- (b) Describe the purpose and scope of the disclosure in the Annual Statement Notes to Financial Statements for asbestos and environmental liabilities.
- Purpose: To monitor the levels of direct, assumed, ceded and net loss and LAE reserves for asbestos and environmental liabilities since they require special reserving methodology and company aggregate patterns can be compared to comparable industry patterns.
 - Scope: For asbestos and environmental liabilities from the pre-1986 CGL policy or similar policies that did not exclude asbestos and environmental exposures.
- (c) Identify an example of an asset that cannot be used to pay policyholder claims that is at least partially admitted on the statutory balance sheet.

Commentary on Question:

There are many assets that can be used as an example. The model solution shows only one of these assets as an example of a full credit solution.

Operating software.

- (d) Explain the justification for allowing the asset identified in part (c) to be admitted on the statutory balance sheet.

Commentary on Question:

Solution for part (d) is dependent on the solution to part (c). The model solution represents a full credit response based upon the model solution given for part (c).

If operating software were not admitted, insurers might not upgrade software leading to inefficient operations.

5. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

- (4f) Describe the development of general insurance programs controlled by government or collective insurance industry organizations.

Sources:

Facility Association, "Considerations for Residual Market Regulation"

Solution:

- (a) Describe the relationship between rate regulation and the size of residual automobile insurance markets based upon U.S. experience as noted in the Facility Association of Canada (FAC) report "*Considerations for Residual Market Regulation.*"

Prior approval rate regulation is associated with larger residual market shares as compared to no-file or use and file.

- (b) Describe three non-monetary barriers to the residual market that regulators in North America have used to limit the size of residual automobile insurance markets.

Commentary on Question:

The model solution describes four non-monetary barriers. Only three were required for full credit.

- Requiring consumers applying for insurance through residual markets to have one or more prior declination letters from voluntary market insurers.
- Capping or limiting broker commissions in residual markets.
- A binder control registry requiring the broker or agent to record why a car and/or driver is being insured through the residual market and to affirm that the applicant has been informed that he/she is having his/her coverage placed through the residual market.
- "Take all comers" regulations which typically require an insurer to accept all business that fits the underwriting guidelines that have been filed with a regulator.

5. Continued

- (c) Explain the justification offered by the FAC for recommending the elimination of non-monetary barriers.

Commentary on Question:

The model solution includes six bullet points of information. The information included in any four of them were required for full credit.

- In the absence of appropriate voluntary/residual market pricing relationships, these measures are relatively ineffective.
- The average residual market price must be significantly above the average voluntary market price for non-monetary barriers to be effective.
- Non-monetary barriers needlessly add costs (compliance, administration, regulatory oversight) to the system. These costs do not appear to be justified given that non-monetary barriers have been historically ineffective at limiting the size of the residual market.
- Efforts need to be made to monitor residual market rates to ensure they are the true market of last resort. There is a need to ensure that they remain meaningfully above rates in the voluntary market for a given risk.
- Residual market rates should include all costs to provide coverage including both the direct costs of the residual market mechanism plus costs incurred by the voluntary market insurers to support the mechanism.
- The best method to restrict the size of the residual market is to allow the markets to be competitive. Prior approval should be replaced with file and use.

6. Learning Objectives:

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

- (5d) Understand mass torts/class action suits and discuss their impact on the general insurance industry.
- (5e) Describe and interpret legal cases/issues from *Important Legal Cases with Respect to the U.S. General Insurance Industry*.

Sources:

White, M., “Asbestos and the Future of Mass Torts”

Morgan, B., “Courts Are Now Rejecting Insurers' Reimbursement for Defending Non-covered Claims”

Rose, B. and Falletta, C., “Wyeth v. Levine: Where Do We Go From Here?”

Solution:

- (a) Assess the consistency of the court’s ruling in favor of the plaintiffs with the precedent setting case of *Wyeth v. Levine*.

Commentary on Question:

The model solution is just one example of a full credit solution. It illustrates the level of detail required for full credit.

- In *Wyeth v. Levine*, the Supreme Court found that FDA labeling requirements did not preempt state product labeling law.
- The court held it was possible for Wyeth to comply with both federal and state requirements, unless there was “clear evidence that the FDA would not have approved a change.”
- The court noted that Wyeth could have changed/strengthened its warning pursuant to regulations which permit a manufacturer to change its “label to ‘add or strengthen a contraindication, warning, precaution, or adverse reaction’” without waiting for agency approval.”
- Congress did not intend FDA oversight to be the exclusive means of ensuring drug safety and effectiveness.
- This case is similar to *Wyeth v. Levine*. Gene-Genie could have strengthened the warning without prior FDA approval. FDA would not have had a problem with strengthening the warning.
- Therefore, the court’s ruling against Gene-Genie is consistent with the ruling in *Wyeth v. Levine* in which the court ruled against Wyeth.

6. Continued

- (b) Assess MPE's ability to recover the 2.5 million in defense costs using the precedent setting case of *Buss v. Superior Court* as a guide.
- In the *Buss v. Superior Court* case, the California Supreme Court held that an insurer was entitled to reimbursement for defense costs of the non-covered claims and that the insurer had the right to seek reimbursement.
 - Therefore, MPE should be able to recover using *Buss v. Superior Court* as a guide.
- (c) Explain three reasons why the Hope-G1 mass tort would not be similar to the asbestos mass tort with respect to ultimate costs.

Commentary on Question:

The model solution is just one example of a full credit solution. Other valid reasons were acceptable.

- Asbestos was included in many products exposing a great number of people in its manufacture and use. In comparison, Hope-G1 affects only a limited number of people.
- Asbestos was in use for decades. Hope-G1 was only on the market for several years.
- Disease from asbestos has a very long latency period from exposure (over many years). Hope-G1's effect on a fetus is known relatively quickly.

7. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

- (1g) Demonstrate knowledge of taxation for general insurers in the United States.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 15 (Federal Income Taxes for General Insurers)

Solution:

- (a) Explain why the Internal Revenue Service uses Schedule P Part 1 instead of Schedule P Part 3 for the loss payment pattern procedure used in the calculation of tax basis reserves.
- The Internal Revenue Service stipulates that reserves are to include all LAE. Part 1 includes both AO & DCC whereas Part 3 excludes AO.
 - Part 1 is audited whereas Part 3 is not, so Part 1 is viewed as more “reliable.”
- (b) Identify two reasons why an insurer may elect not to use its own loss reserve discount factors for the calculation of tax basis reserves.

Commentary on Question:

There are a number of valid reasons. Any two valid reasons were required for full credit. The model solution provides two valid reasons.

- A line of business with insufficient data for the company.
 - A reinsurance line of business.
- (c) Calculate the Alternative Minimum Taxable Income for calendar year 2014.

Commentary on Question:

The model solution shows the level of detail expected for full credit. It represents one approach to showing all the steps in the calculation.

AMTI = Alternative Minimum Taxable Income, TI = Taxable Income,
ACE = Adjusted Current Earnings Adjustment

AMTI = Regular TI + ACE

7. Continued

$$\begin{aligned}\text{Regular TI} &= \text{Taxable Investment Income} + \text{Taxable Underwriting Income} \\ &= (\text{Taxable Interest Income} + \text{Taxable Dividends Received} + \text{Prorated} \\ &\quad \text{Portion of Tax-Exempt Interest Income} + \text{Prorated portion of} \\ &\quad \text{Dividends Received Deduction} + \text{Realized Capital Gains}) + (\text{Stat} \\ &\quad \text{Underwriting Income} + \text{Revenue Offset for UEPR} + \text{Change in Loss} \\ &\quad \text{Reserve Discount})\end{aligned}$$

$$\text{No premium growth} \rightarrow \text{Revenue Offset for UEPR} = 0$$

$$\begin{aligned}\text{Regular TI} &= (250 + 100 \times (1 - 70\%) + 800 \times 15\% + 100 \times 70\% \times 15\% + 50) + \\ &\quad (-200 + 0 + 9 \times (1 - 90\%)) \\ &= (250 + 30 + 120 + 10.5 + 50) + (-200 + 0.9) \\ &= 261.4\end{aligned}$$

$$\begin{aligned}\text{ACE} &= 75\% \times \text{Investment Income Escaping Taxation} \\ &= 75\% \times (\text{Municipal Bond Income} - \text{Prorated portion of Municipal Bond} \\ &\quad \text{Income} + \text{Dividends Received Deduction} - \text{Prorated portion of Dividends} \\ &\quad \text{Received Deduction}) \\ &= 75\% \times (800 - 800 \times 15\% + 100 \times 70\% - 100 \times 70\% \times 15\%) \\ &= 75\% \times (800 - 120 + 70 - 10.5) \\ &= 75\% \times (739.5) \\ &= 554.625\end{aligned}$$

$$\begin{aligned}\text{AMTI} &= 261.4 + 554.625 \\ &= 816.025\end{aligned}$$

8. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

- (4b) Describe and interpret the current state of general insurance regulation in the U.S. and its development.

Sources:

Insurance Regulation, The Institutes

- Chapter 10 (Producer Regulation)

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 13 (General Insurance Financial Ratings)

Solution:

Assess Pat's actions with respect to CWI's insurance placement giving consideration to the following:

- (i) Fiduciary responsibilities
- (ii) Errors and omissions
- (iii) NAIC Unfair Trade Practices Act

Commentary on Question:

Widely varying responses for full credit are possible. The model solution includes more detail than was required for full credit but it does not include every possible issue that could be addressed. Only two examples of Pat's behavior for each of issues (i) to (iii) was required for full credit.

As a producer, Pat has failed in meeting the fiduciary responsibilities to the consumer CWI by:

- Purporting that NCGI's coverage was the best available, while it was clearly not since the contents limit was inadequate.
- Stating that hurricane losses were covered when the policy limitations should have been disclosed.
- Stating that NGIC was financially secure with only a B- A.M. Best rating;
- Not presenting the option of RBIC, even though the premium was higher, because the premium difference was not significant giving consideration to the fact that RBIC is a financially secure insurer and the RBIC policy had adequate limits.

8. Continued

- Placing his/her financial interests above those of the consumer (larger commission and bonus commission).

It is evident that an errors and omissions claim can be made against Pat by CWI, because Pat:

- Made a statement of hurricane coverage that was in error that caused CWI to receive less than the amount anticipated for the hurricane damage loss; and
- Omitted informing CWI that the underinsurance on contents in the NGIC policy would limit payments on losses (whereas the RBIC policy without this issue would not).

Pat has engaged in behavior that is prohibited by the NAIC Unfair Trade Practices Act (UTPA) by including false statements and misrepresentations (e.g., financial security of NCGI, hurricane coverage, underinsurance of contents issues) and may be subject to penalties up to license suspension or revocation.

Also, the return of a portion of Pat's commission to CWI is referred to as rebating. Rebating is explicitly prohibited under the UTPA. This practice would not be legal and subject Pat to further penalties.

9. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

- (4f) Describe the development of general insurance programs controlled by government or collective insurance industry organizations.
- (4g) Describe the mechanisms of operation for government and/or collective insurance industry controlled programs as included in the resources.

Sources:

AAA Flood Insurance Subcommittee, "The National Flood Insurance Program: Past, Present ... and Future?"

Cappelletti, A., "Government Provision of General Insurance"

NAIC, "Biggert-Waters Flood Insurance Reform Act of 2012"

Solution:

- (a) Describe a situation in which the purchase of a NFIP policy is considered mandatory by federal law.

Property owners in "special flood hazard areas" who obtain loans from federally-regulated lending institutions.

- (b) Provide one argument for and one argument against including an explicit cost of capital component in the NFIP ratemaking process.

Commentary on Question:

There are a number of different valid arguments, for and against, that can be made. The model solution is one example of a full credit response.

For:

It is an actuarial principle to include this cost in rates. Without this load, the NFIP will be not be able to make up deficits from major catastrophic events.

Against:

The NFIP does not need this cost included because the federal government could, theoretically, provide unlimited liquidity and credit for a major catastrophic event.

9. Continued

- (c) Describe the Biggert-Waters methodology for establishing the NFIP reserve fund.
- Requires phase-in with a reserve ratio equal to 1% of the sum of the total potential loss exposure.
 - FEMA to increase or decrease the amount of aggregate annual insurance premiums to be collected to maintain the reserve ratio.
- (d) Explain why the NFIP may charge different premiums to the two properties.
- Rates are differentiated by elevation relative to base flood elevation.
- (e) Explain how this information could be used in determining full actuarial rates for NFIP policies in coastal regions.

Commentary on Question:

Widely varying full credit responses are possible. The model solution is an illustrative example of a full credit solution.

- The best estimates for flood rates are estimates of losses and expenses for the policy term being priced, not long-term trends.
- Trends should be monitored for long-term projections and investigation of loss mitigation strategies for the future.
- Incorporation of these trends should be considered for inclusion in catastrophe modeling.

10. Learning Objectives:

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

- (5e) Describe and interpret legal cases/issues from *Important Legal Cases with Respect to the U.S. General Insurance Industry*.

Sources:

Burrows, V., "Constitutional Limits on Punitive Damages Awards: An Analysis of the Supreme Court Case Philip Morris USA v. Williams"

Solution:

- (a) Explain the argument that Williams used to assert that punishment for the effects of a defendant's conduct on non-parties should be included in the punitive damages award.

Commentary on Question:

There are a number of issues that Williams used in the argument for the inclusion of conduct on non-parties. The model solution includes three issues. These are not the only issues that Williams used in the argument. A full credit response required only two issues.

- Williams argued that punitive damages traditionally have been awarded for injuries or potential injuries to others in addition to the plaintiff and have more than a mere compensatory purpose.
 - Williams cited the Supreme Court's holding in BMW that punitive damages awards can be "supported by the State's interest in protecting its own consumers and its own economy."
 - Williams discussed Oregon's statutory safeguards that protect against multiple punitive damages awards imposed for the same misconduct.
- (b) Explain the argument Philip Morris used to assert that punishment for the effects of a defendant's conduct on non-parties should be excluded from the punitive damages award.

Commentary on Question:

There are a number of issues that Philip Morris used in the argument for the exclusion of conduct on non-parties. The model solution includes three issues. These are not the only issues that Philip Morris used in the argument. A full credit response required only two issues.

10. Continued

- Philip Morris argued that the focus of punitive damages should be on the harm inflicted on the plaintiff.
 - Philip Morris warned of a risk of multiple, excessive punishment because the outcome of one case does not restrict future plaintiffs from filing suit.
 - Philip Morris argued that the plaintiff's attorneys did not identify non-parties or provide evidence that they suffered from the defendant's misconduct.
- (c) Explain the U.S. Supreme Court decision in *Philip Morris USA v. Williams*, regarding whether or not punitive damages awards in a case can include punishment for the effects of a defendant's conduct on non-parties.

Commentary on Question:

There are a number of elements in the Supreme Court decision. The model solution includes a number of these. They are not the only elements of the Supreme Court decision. A full credit response was expected to cover the level of detail illustrated by the model solution.

- The Court found that the due process clause does not permit a state “to use a punitive damages award to punish a defendant for injury that it inflicts upon nonparties.”
- The Court found that an individual cannot be punished by a state for an injury to a non-party victim without “an opportunity to present every available defense.”
- The Court found that allowing a defendant to be punished for harming a non-party victim “would add a near standardless dimension to the punitive damages equation.”
- However, the Court stated that “evidence of actual harm to nonparties can help to show that the conduct that harmed the plaintiff also posed a substantial risk of harm to the general public” which can be used to determine reprehensibility of behavior which in turn can be used to determine a punitive damages award.

11. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

- (1e) Understand and apply the concepts of reinsurance accounting.

Sources:

Brehm, P. and Ruhm, D., "Risk Transfer Testing of Reinsurance Contracts"

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 4 (Accounting for Reinsurance Contracts)

Solution:

- (a) Calculate the following amounts for Re-X's proposed reinsurance contract:

- (i) Value at Risk (VaR) at the 90th percentile
- (ii) Tail Value at Risk (TVaR) at the 90th percentile
- (iii) Expected Reinsurer Deficit (ERD)
- (iv) Right Tailed Deviation (RTD) with $\alpha = 4$

Commentary on Question:

The model solution shows the level of detail expected for full credit. It represents one approach to showing the steps in the calculations.

- (i) $\text{VaR}(90\%) = \text{Reinsurer's net economic loss at } 90^{\text{th}} \text{ percentile}$
 $= (0.9 \times 7 / 1.02) - 6 = 0.18$
 $\text{VaR}(90\%) = 0.18 \text{ million}$
- (ii) For TVaR(90%) need to calculate the weighted average economic loss at the 90th percentile and above.

Direct loss	Probability	Reinsured loss	Economic loss
22	5.0%	6.30	0.18
30	3.0%	13.50	7.24
80	1.5%	58.50	51.35
120	0.5%	72.00	64.59

11. Continued

$$\begin{aligned} \text{TVaR}(90\%) &= (5\% \times 0.18 + 3\% \times 7.24 + 1.5\% \times 51.35 + 0.5\% \times 64.59) / \\ &\quad (5\% + 3\% + 1.5\% + 0.5\%) \\ &= 13.19 \text{ million} \end{aligned}$$

- (iii) ERD = pT/P, where P = Premium = 6, p = probability of net loss, and T = average severity of net loss (which in this example is TVaR(90%)).

$$p = 5\% + 3\% + 1.5\% + 0.5\% = 10\%$$

$$T = \text{TVaR}(90\%) = 13.19$$

$$\text{ERD} = 10\% \times 13.19/6 = 22.0\%$$

- (iv) Right Tailed Deviation (RTD) with $\alpha=4$

$$F^*(x) = 1 - [1 - F(x)]^{0.5}$$

Reinsured loss	Probability	F(x)	F*(x)	Probability*
0.0	80.0%	80.0%	55.3%	55.3%
0.0	10.0%	90.0%	68.4%	13.1%
6.3	5.0%	95.0%	77.6%	9.3%
13.5	3.0%	98.0%	85.9%	8.2%
58.5	1.5%	99.5%	92.9%	7.1%
72.0	0.5%	100.0%	100.0%	7.1%

$$\text{RTD} = E^*(x) - E(x)$$

$$= (9.3\% \times 6.3 + 8.2\% \times 13.5 + 7.1\% \times 58.5 + 7.1\% \times 72) - (5\% \times 6.3 + 3\% \times 13.5 + 1.5\% \times 58.5 + 0.5\% \times 72)$$

$$= 9.0$$

$$\alpha\text{RTD} = 36$$

- (b) Assess the appropriateness of the use of reinsurance accounting by SI for this reinsurance treaty.

Commentary on Question:

Widely varying responses for full credit are possible. The model solution is an illustration of one possible full credit response.

This contract appears to transfer significant insurance risk because:

- TVaR(90%) represents a significant loss,
- ERD is much greater than 1%, and
- αRTD with $\alpha=4$ is much greater than the reinsurance premium.

VaR is not significant and the contract doesn't meet the 10-10 rule but these measures do not look at the entire tail so they are not relevant.

12. Learning Objectives:

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

- (3a) Describe, interpret and apply the applicable Standards of Practice.
- (3b) Describe, interpret and apply the responsibilities of the actuary with respect to the Statement of Actuarial Opinion and the Actuarial Report.
- (3c) Compare the Statements of Actuarial Opinion in the U.S. and Canada.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 14 (Overview of the General Insurance Statement of Actuarial Opinion)

AAA, Committee on Property and Liability Financial Reporting, “A Public Policy Practice Note, Statements of Actuarial Opinion on Property and Casualty Loss Reserves”

Actuarial Standards Board, Actuarial Standard of Practice No. 36, Statements of Actuarial Opinion Regarding Property/Casualty Loss and Loss Adjustment Expense Reserves

Solution:

- (a) Compare the following items with respect to appointed actuaries in the U.S. and appointed actuaries in Canada:
 - (i) Experience required to be the appointed actuary
 - (ii) Recommendations to the Board of Directors regarding the insurer’s operations
- (i) In the U.S., the appointed actuary needs at least three years of responsible experience relevant to the subject of the SAO under review by an actuary who was qualified to issue the SAO.

In Canada, the appointed actuary needs appropriate Canadian practical experience, defined as work in Canada for at least three of the last six years, of which at least one year was performing valuation of Canadian actuarial liabilities of an insurance company.

12. Continued

- (ii) In the U.S., the NAIC notes that actuaries are to make recommendations to the Board of Directors although the NAIC provides no specific items that should be addressed.

In Canada, the appointed actuary is to report to the Board on the insurer's financial condition in a DCAT report, recommend risk mitigation strategies for the insurer and report whether the insurer has taken the advice.

- (b) Explain why the Statement of Actuarial Opinion (SAO) in the U.S. does not include the appointed actuary's range of reasonable estimates of reserves.
- For the SAO in the U.S., the appointed actuary opines on the reserves held by the company.
 - The SAO is a public document attached to the Annual Statement and sent to the insurance departments of all states where the insurer writes business.
 - The actuary's estimate is considered proprietary information.
 - Including a best estimate by the appointed actuary in the SAO is inherently problematic. If the actuary's best estimate is not the carried reserve, the insurer may be questioned by insurance supervisors.
- (c) Identify the report in the U.S. that includes the appointed actuary's range of reasonable estimates of reserves.

Commentary on Question:

The model solution identifies the Actuarial Opinion Summary. It was also acceptable to identify the Actuarial Report.

Actuarial Opinion Summary

- (d) Identify two considerations the appointed actuary should take into account in determining whether or not it is reasonable to make use of another's unpaid claims estimate analysis or opinion in a SAO according to Actuarial Standard of Practice (ASOP) No. 36.

Commentary on Question:

The model solution identifies four considerations. Only two considerations were required for full credit.

12. Continued

- The amount of the reserves covered by another's analyses or opinions in comparison to the total reserves subject to the actuary's opinion;
- The nature of the exposure and coverage;
- The way in which reasonably likely variations in estimates covered by another's analyses or opinions may affect the actuary's opinion on the total reserves subject to the actuary's opinion; and
- The credentials of the individual(s) that prepared the analyses or opinions.

13. Learning Objectives:

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.
4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

- (3e) Discuss the International Actuarial Association position on the function of the actuary in prudential supervision.
- (4b) Describe and interpret the current state of general insurance regulation in the U.S. and its development.

Sources:

IAA, "The Function of the Actuary in Prudential Supervision"

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 14 (Overview of the General Insurance Statement of Actuarial Opinion)

Insurance Regulation, The Institutes

- Chapter 8 (Rate Regulation)

Solution:

- (a) Identify the four other key areas in which active actuarial participation may be considered valuable for involvement in prudential supervision according to the IAA.
 - Pricing and product design;
 - Establishing aggregate policy and claim liabilities;
 - Determining compliance with legal or regulatory capital requirements; and
 - Reporting responsibility directly to the Board.
- (b) Describe how insurance supervision in the United States makes use of actuarial involvement for three of the four key areas identified in part (a).

Commentary on Question:

The model solution includes all four key areas identified in the solution to part (a). Only three of the four were required for full credit.

13. Continued

- Pricing and product design: This varies by state / line of business. However some states do include actuarial principles for ratemaking, and some states require actuarial oversight of rate filings (for lines of business where rate filings are required).
 - Establishing aggregate policy and claim liabilities: U.S. supervision includes involvement of the actuary by requiring an appointed actuary to provide a SAO and an actuarial report to both the Board of Directors and regulators.
 - Determining compliance with legal or regulatory capital requirements: U.S. supervision has not specified this role for actuaries. However, the actuary is required to review IRIS ratios and RBC levels in carrying out the duties of the appointed actuary.
 - Reporting responsibility directly to the Board: The duties of the appointed actuary in the U.S. specifically require a report be made to the Board of Directors.
- (c) Describe two other laws or statutes that should exist in order to assist and protect the responsible actuary in the fulfillment of his or her statutory duties.
- The responsible actuary should have the additional legal responsibility to express his or her concerns to the supervisor as a last resort when all other avenues for persuading the insurer's management have been exhausted.
 - The responsible actuary reporting to the supervisor any improper actions by insurer management should have legal protection from unfair termination of employment or from legal action by the insurer as a result of fulfilling his or her statutory duties.

14. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.
3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

- (1a) Understand and apply the concepts of insurance accounting.
- (1c) Describe the elements of the NAIC Annual Statement.
- (1f) Understand and apply the elements of discounting for general insurance loss reserves.
- (3a) Describe, interpret and apply the applicable Standards of Practice.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 7 (Statutory Loss Accounting and Schedule P)

NAIC Statement of Statutory Accounting Principles 65, "Property and Casualty Contracts"

Actuarial Standards Board, Actuarial Standard of Practice No. 20, Discounting of Property/Casualty Unpaid Claim Estimates

Solution:

- (a) Describe a method for estimating KGIC's share of the SIF unfunded liability.

Commentary on Question:

Widely varying responses were possible for full credit. The model solution represents one possible full credit solution.

Use a market share split of industry total workers compensation direct and assumed premium for the state. This should be computed by year in which the amounts were incurred for the unfunded liability.

14. Continued

- (b) Identify where in Schedule P KGIC's SIF obligations should be reported.

Assessments are recorded as a paid loss in Schedule P and the share of unfunded liability is recorded as an unpaid loss in Schedule P.

- (c) Recommend an approach for discounting KGIC's SIF unfunded liability obligations assuming that the state permits these obligations to be reported on a discounted basis.

Commentary on Question:

Widely varying responses were possible for full credit. The model solution represents one possible full credit solution.

Discount the unfunded liability on the same basis that losses are discounted for tax purposes with respect to discount rate and payment pattern.

- (d) Describe the accounting treatment for the discounting of SIF obligations in KGIC's Schedule P.

The discount should be reported in the column for Nontabular Discount – Loss in Schedule P Part 1.

- (e) Describe the approach for discounting KGIC's workers compensation tabular indemnity reserves.

Discounts are determined with reference to actuarial tables which incorporate interest and contingencies such as mortality, remarriage, inflation, or recovery from disability.

- (f) Describe three common approaches to the selection of a discount rate as noted in Actuarial Standard of Practice (ASOP) No. 20.

- “Risk-Free Approach”: Approximated by rates of investment return available on fixed income assets having low investment risk and timing characteristics comparable to those of the reserves.
- “Portfolio Approach”: The selected discount rates in this approach are based on the anticipated return from a selected portfolio of assets. One needs to consider the maturities of the assets and the estimated timing of future payments on reserves.
- “Discount Rates Requested by Another Party” with appropriate disclosure and guidance from ASOP 41.

15. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

- (4c) Compare different forms of rate regulation.

Sources:

Insurance Regulation, The Institutes

- Chapter 8 (Rate Regulation)

Solution:

- (a) Describe five approaches to rate filing regulation for general insurance.

Commentary on Question:

The model solution includes all six approaches as listed in the source material. Only five of the six were required for full credit.

- Prior-approval: Prior-approval generally means that regulators must approve rates and supporting rules before the insurer can use them in that state.
 - File-and-use: Under file-and-use systems, the insurer must file rates and rules within a specified time before use. That period gives regulators a minimal opportunity to uncover violations of law or other potentially questionable practices.
 - Use-and-file: Under use-and-file laws, the insurer can use any rate it wants, provided that the insurer files the rate with regulators within a specified time frame after implementing it. Regulators then have a reasonable period in which to review the rate.
 - No-file (or open competition): No-file allows insurers to develop and use rates without having to get approval or file with state regulators.
 - State-mandated rates: Some states set the rates that insurers can use. If insurers do not use the mandated rates, they cannot do business legally.
 - Flex rating: Flex rating is a state law requiring prior approval only if the new rates exceed a certain percentage above (and sometimes below) the rates previously filed.
- (b) Explain why the degree of rate regulation varies in many jurisdictions from minimally regulated for ocean marine insurance to highly regulated for private passenger automobile insurance.

15. Continued

Ocean Marine insurance has very little rate regulation due to the following reasons:

- They are highly individualized risks;
- There is very little statistical information available to justify rates; and
- The transaction involves knowledgeable buyers and sellers.

Private Passenger Automobile insurance often involves regulatory review of overall rates due to the following reasons:

- It is legally required or socially desirable for consumers to purchase it;
- Consumers are generally uninformed; and
- There exists a highly uniform statistical plan with credible rate data.

16. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

- (1a) Understand and apply the concepts of insurance accounting.
- (1c) Describe the elements of the NAIC Annual Statement.
- (1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.
- (1e) Understand and apply the concepts of reinsurance accounting.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 4 (Accounting for Reinsurance Contracts)
- Chapter 6 (Schedule F, Statutory Credit for Reinsurance)

Solution:

- (a) Calculate BPIC's net paid and incurred losses and DCC expenses as reported in Schedule P for the NCPA fire losses as of December 31, 2015.

For the Giant XS Re per location excess reinsurance, there are two losses that are reinsured as follows:

- Location 1: BPIC ceded = minimum of $(32 - 1)$ and $5 = 5$ million
- Location 2: BPIC ceded = minimum of $(26 - 1)$ and $5 = 5$ million

Therefore, the loss net of the Giant XS Re reinsurance is 27 million $(= 32 - 5)$ for Location 1 and 21 million $(= 26 - 5)$ for Location 2.

For the Regal Cat Re catastrophe excess reinsurance, BPIC assumes that the fires are two catastrophe events and reports the results as such. The Regal Cat Re catastrophe reinsurance is reported by BPIC as follows:

- Location 1: BPIC ceded = minimum of $(27 - 2)$ and $25 = 25$ million
- Location 2: BPIC ceded = minimum of $(21 - 2)$ and $25 = 19$ million

Therefore, the loss net of all the reinsurance is 2 million $(= 27 - 25)$ for Location 1 and 2 million $(= 21 - 19)$ for Location 2.

16. Continued

The total Schedule P net incurred loss and DCC for BPIC with respect to the NCPA fire losses is 4 million. This is also the paid amount.

- (b) Calculate BPIC's total Schedule F Provision with respect to reinsurance recoverables for the NCPA fire losses as of December 31, 2015.

Regal Cat Re contends that the two NCPA fires are one catastrophe event. Under this contention, the ceded reinsurance is as follows:

- Minimum of $(27 + 21 - 2)$ and $25 = 25$ million for both locations combined.

Under BPIC's contention of two catastrophes, the ceded catastrophe reinsurance is 44 million ($= 25 + 19$).

This leaves 19 million ($= 44 - 25$) of ceded losses in dispute with Regal Cat Re, for which the Schedule F provision is 20%. There are no amounts over 90 days past due from Regal Cat Re, so the Schedule F provision for overdue amounts is zero. The Schedule F provision for the Regal Cat Re recoverables is 20% of 19 million = 3.8 million.

With respect to the Giant XS Re per location excess reinsurance, 10 million is recoverable from Giant XS Re. There are no ceded losses in dispute, and no amounts over 90 days past due so the Schedule F provision for Giant XS Re recoverables is zero.

Therefore the total Schedule F provision for the NCPA fire losses is 3.8 million.

17. Learning Objectives:

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

- (3a) Describe, interpret and apply the applicable Standards of Practice.
- (3b) Describe, interpret and apply the responsibilities of the actuary with respect to the Statement of Actuarial Opinion and the Actuarial Report.
- (3d) Describe and apply the concept of materiality.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 14 (Overview of the General Insurance Statement of Actuarial Opinion)

AAA, Committee on Property and Liability Financial Reporting, “A Public Policy Practice Note, Statements of Actuarial Opinion on Property and Casualty Loss Reserves”

AAA, Task Force on Materiality, “Materiality, Concepts on Professionalism”

NAIC Statement of Statutory Accounting Principles 3, “Accounting Changes and Corrections of Errors”

Solution:

- (a) Select the materiality standard to be disclosed in your SAO. Justify your selection.

Commentary on Question:

Different correct responses are possible here. The key to achieving full credit is providing a sound justification for the selected materiality standard. The model solution is an illustration of a full credit response.

A material item in a report affects decision making by the user of the report. Users of the SAO include insurance supervisors. Insurance supervisors are concerned with surplus levels and solvency

One may select the materiality standard as a percentage of surplus, reserves or premiums. Materiality based upon surplus addresses the needs of insurance supervisors. 1% to 5% of surplus (12,000 to 60,000) could be selected because differences greater than this may affect decision making by the user. However, given the very low relative value of reserves to surplus, I would select the low end of the range; that is, 1% of surplus or 12,000 as the materiality standard.

17. Continued

- (b) Indicate the type of Actuarial Opinion you would have rendered. Justify your selection.

Commentary on Question:

The response here is dependent on the materiality standard selected in part (a). The model solution for this part is based upon the model solution provided for part (a).

- Determination of Reasonable Provision.
- The reserve amount makes a reasonable provision for the liabilities since the difference between the actuarial estimate and the reported reserves is less than the materiality standard.

- (c) Explain what is required of BNGI after being informed of this accounting error.

Commentary on Question:

There are a number of actions required by BNGI. Five bullet points are listed in the model solution. This is not an exhaustive list. Two bullet points of correct information were required for full credit.

- The insurer is required to correct the accounting error and shall file an amended financial statement.
- The insurer may choose to reclassify the receivable as a contra-liability, increase the liability for loss and LAE and decrease surplus appropriately.
- The insurer must communicate with the Appointed Actuary with respect to the error and any amendment to the financial statements.
- The insurer is to require the Appointed Actuary to report to the Board of Directors or Audit Committee of the insurer if the Appointed Actuary determines that the SAO was in error.
- The insurer is to forward all relevant communication to the domiciliary regulator.

- (d) Explain what is required of you after being informed of this accounting error.

Commentary on Question:

There are a number of actions required by the Appointed Actuary. Five bullet points are listed in the model solution. This is not an exhaustive list. The model solution represents a full credit response.

17. Continued

- The actuary is required to revise the SAO, AOS, and Actuarial Report to reflect this material correction of an error by the insurer.
- If the insurer elects to include a reclassification of the receivable as a contra-liability, the corrected reported reserves would be 70,000 less than your estimate. Thus the actuary should change the type of opinion to “Determination of Deficient or Inadequate Provision” since the reported reserves are less than the minimum amount the actuary believes to be reasonable.
- If the insurer increases the liability for loss and LAE and decreases surplus appropriately, it is possible that the reserve opinion could still be “Reasonable.”
- The actuary has a protocol with specified time frames for communication with the insurer, its board, and the regulator with respect to this material correction of an error by the insurer.
- The actuary should examine the asset and liability side of the balance sheet carefully and question any write-in items that are not clearly specified.

18. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

- (4f) Describe the development of general insurance programs controlled by government or collective insurance industry organizations.
- (4g) Describe the mechanisms of operation for government and/or collective insurance industry controlled programs as included in the resources.

Sources:

Cappelletti, A., "Government Provision of General Insurance"

Solution:

- (a) Describe four reasons that have been put forward as justification for governments to provide some insurance products directly to their citizens instead of relying on private insurance companies.
 - (i) To fill insurance needs not met by private insurers
 - (ii) To make the purchase of insurance compulsory
 - (iii) To achieve greater efficiency
 - (iv) To achieve specific social objectives
- (b) Describe what is meant by the term "social insurance."

Social insurance can be thought of as insurance designed to solve issues of social significance, usually administered or closely supervised by the government.

- (c) Identify two examples of social insurance.

Commentary on Question:

There exist a number of examples of social insurance. The model solution provides two examples.

- Social security
- Unemployment insurance

- (d) Explain what differentiates social insurance from government social welfare programs.

18. Continued

- When benefits provided by a program are linked to the overall financial need of the recipient, the program is considered to be a social welfare program.
 - In the case of social insurance, the recipients of benefits have earned the right to receive them through their earlier contributions to the program.
- (e) Describe one possible unintended negative consequence for each of the following three insurance products provided by government:
- (i) Bank deposit insurance
 - (ii) Unemployment insurance
 - (iii) Disability insurance

Commentary on Question:

There are a number of possible unintended negative consequences. The model solution provides one for each of the three lines of insurance.

- (i) Increased risk taking by financial institutions
- (ii) Increase in extent and duration of unemployment
- (iii) Increase in disability claims among those who have difficulty finding employment

19. Learning Objectives:

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

- (5a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing, Assignment 2 (Tort Law)

Solution:

- (a) Identify two potential starting points for the statutory time period in applying the statute of limitations to this suit.

Commentary on Question:

There exist a number of valid potential starting points. The model solution provides two. Two were required for full credit.

1. When the design of the addition was completed (since this is when the alleged negligence in design occurred).
 2. When the addition collapsed causing injury and damage (since this is when the actual harm results).
- (b) Identify which of the two starting points from part (a) is most likely to be used by the courts. Justify your answer.

Commentary on Question:

The response to this part is dependent upon the response given in part (a). The model solution for this part is based upon the model solution provided for part (a). Two bullet points are given for the justification of the selection. Only one was required for full credit.

The courts would likely select “when the addition collapsed causing injury and damage” as the starting point because this is when:

- there was actual harm to the plaintiff; and
- the plaintiff was first aware of the potential negligence.

19. Continued

- (c) Assess the likelihood of a breach of duty being found against each of the four defendants (architect, municipality staff for design approval, municipal building inspectors, and contractor) in this suit.

Commentary on Question:

Widely varying responses for full credit are possible. The model solution is an illustration of a full credit response.

- Failure to conform to a standard of care is required to show a breach of duty. Courts usually apply a reasonable person test. However, for professionals, the test is the local standard of professionals.
 - It is probable that the architect did not adhere to the professional standards for architects in the deficient design of the addition, so a breach of duty owed to the plaintiff would likely be found. For the same reason, the municipal architects that approved the design would likely be found to have breached the duty of care owed to the plaintiff.
 - With respect to the municipality building inspectors, it would depend on their level of expertise. If they were professionals, they would be treated like the architects. However, if the reasonable person test was applied they might not be found to have breached a duty.
 - The contractor responsible for constructing the addition acted reasonably by contacting the designer. However, the contractor could have also contacted the municipality staff with the concerns over the design. It is possible that the contractor will be found to have breached a duty but also may just as likely be found to have not breached a duty.
- (d) Explain how the courts would likely view the use of governmental immunity by all municipality staff in this suit.

Commentary on Question:

Arguments can be made about whether or not governmental immunity applies. Full credit responses were expected to lay out a compelling explanation. The model solution is an illustration of a full credit response.

- Governmental immunity protects governments from tort liability. Municipalities would not receive governmental immunity for functions that are or could also be performed by private enterprise.
- With respect to the design approval staff, this is more than likely a private enterprise function (peer review from another professional) so governmental immunity would not be likely.
- With respect to the building inspectors, law enforcement is more than likely a strict government function and would have immunity.

20. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

- (1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.
- (1h) Estimate the premium asset for retrospectively rated policies for financial reporting.

Sources:

Teng, M. and Perkins, M., “Estimating the Premium Asset on Retrospectively Rated Policies”

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 2 (Accounting for Insurance Contracts)

Solution:

- (a) Calculate the premium asset on retrospectively rated policies as of December 31, 2014 arising from policy years 2010, 2011 and 2012.

Commentary on Question:

The model solution shows the level of detail expected for full credit. It represents one approach to showing the steps in the calculation.

Amounts in the tables are in 1,000s

Step 1

Expected loss emergence = Ultimate losses – Reported losses at prior adjustment
Ultimate losses = Reported losses × Cumulative Development Factor × Percent earned (100% for 2010-2012)

Policy Year	Expected Loss Emergence
2010	$29 = 672 \times 1.010 - 650$
2011	$71 = 651 \times 1.030 - 600$
2012	$317 = 605 \times 1.061 - 325$

20. Continued

Step 2

Calculate CPDLD Ratios for 2nd to 4th retro adjustments where
 CPDLD = Sum of PDL D × Loss Emergence from emergence point to fully emerged point / (100% – loss emerged up to adjustment period)

Retrospective Adjustment	CPDLD Ratios
4 th	$0.20 = (0.3 \times 2\% + 0.0 \times 1\%) / (100\% - 97\%)$
3 rd	$0.34 = (0.4 \times 7\% + 0.3 \times 2\% + 0.0 \times 1\%) / (100\% - 90\%)$
2 nd	$0.496 = (0.6 \times 15\% + 0.4 \times 7\% + 0.3 \times 2\% + 0.0 \times 1\%) / (100\% - 75\%)$

Step 3

Calculate Estimated Total Premium = Booked Premium at Prior Adjustment + CPDLD Ratio × Expected Loss Emergence

Policy Year	Estimated Total Premium
2010	$916 = 910 + 0.2 \times 29$
2011	$999 = 975 + 0.34 \times 71$
2012	$957 = 800 + 0.496 \times 317$

Step 4

Calculate Estimated Premium Asset = Estimated Total Premium – Premium Booked at 12/31/2014

Policy Year	Estimated Premium Asset
2010	$6 = 916 - 910$
2011	$44 = 999 - 955$
2012	$-3 = 957 - 960$

Therefore the premium asset on retrospectively rated policies as of December 31, 2014 arising from policy years 2010, 2011 and 2012 is 47,000 (= 6,000 + 44,000 – 3,000).

- (b) Calculate the admitted portion of the premium asset from part (a) under the rules of U.S. statutory accounting.

10% of unsecured premium assets (i.e., EBUB & ARP) are not admitted. As disclosed, none of the unbilled premiums are secured. Therefore, 42,300 (= 90% × 47,000) is the admitted portion of the premium asset.

21. Learning Objectives:

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

- (2b) Understand and apply the elements of the NAIC RBC formula.
- (2e) Understand the development and principles of solvency regulation, including that in the U.S., Canada and the E.U.
- (2f) Demonstrate knowledge of the E.U. Solvency II standard formula solvency capital requirement.

Sources:

General Insurance Financial Reporting Topics, Second Edition, Society of Actuaries

- Chapter 12 (Solvency Monitoring)

Solution:

- (a) Compare the treatment of natural catastrophe risk in the following regulatory capital formulas:
 - (i) NAIC Risk Based Capital (RBC)
 - (ii) Canadian Minimum Capital Test (MCT)
 - (iii) Solvency II Solvency Capital Requirement (SCR) standard formula
 - (i) RBC currently excludes natural catastrophes. The Solvency Modernization Initiative proposal would include earthquake and windstorm catastrophes as their own risk charges within the square root rule.
 - (ii) MCT includes only earthquake risk in the formula based upon a 1-in-250 to 1-in-500 year event.
 - (iii) SCR includes four natural catastrophe perils (windstorm, earthquake, flood and hail) and the charge is based on a 1-in-200 year event except for earthquake which uses a TVaR measure.
- (b) Explain the rationale for treating man-made catastrophe risks differently from natural catastrophe risks in regulatory capital formulas.

21. Continued

Commentary on Question:

There exist a number of reasons. The model solution shows four reasons. A full credit response was expected to explain three reasons.

Man-made catastrophes are treated differently than natural catastrophes because, unlike natural catastrophes,

- They are more difficult to model since no reliable probability distributions exist;
- Past experience is a poor guide to future events;
- They may affect a single insurer or just a few insurers; and
- Exposures may differ significantly for insurers writing the same line of business.

(c) Describe how the Solvency II SCR standard formula deals with the risk of man-made catastrophes.

- SCR include seven types of man-made catastrophes.
- Charges use exposures and policy provisions.
- Charges are based on scenarios of events.
- Independence is assumed between the different types of man-made catastrophes.

(d) Compare these two methods for funding guaranty funds with respect to:

- (i) Sufficiency of funds
- (ii) Risk of insolvency

Risk-based guaranty funds:

- There may be an issue with sufficiency of funds. It can be insufficient if insolvency occurs before a build-up of funds can occur or it can be excessive when the fund builds up through an extended period without any insolvency.
- Charges are based upon the risk of insolvency so it encourages a reduction of risk by insurers.

Post-insolvency funds:

- No issue with fund build-up as funds are raised as required. However, there is a potential sufficiency issue if a very large insurer fails. In this event, the remaining solvent insurers may not be able to meet their obligations to the fund.
- Post-insolvency funds do not encourage risk reduction. Prudent firms pay the cost of insolvency of firms failing due to excessive risk-taking.