DESERT STATES CHAPTER

IASA Desert States Chapter

October 28, 2015

Scottsdale Hilton and Villas
6333 N. Scottsdale Road

Scottsdale, AZ

ERM, the New Regulatory Requirements and Quantitative Analyses

SD SMART DEVINE
Accounting • Tax • Advisory

HUGGINS®
ACTUARIAL SERVICES, INC.

Presenters

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Objectives

- Objective 1 – Understand the high level requirements of the ERM related regulatory requirements
- Objective 2 - Approach to consolidate the regulatory requirements into a consolidated Enterprise Risk Management process
- Objective 3 - Discussion on sensitivity analysis and economic capital modeling as an evaluation techniques to assess ERM

QUESTIONS

- Biggest Challenge your are facing related to ERM, the New Regulatory Requirements, and Quantitative Analyses.

- Over the next 50 minutes while you are sitting here and you had learned something about ERM, the New Regulatory Requirements, Sensitivity Analysis and Economic Capital Modeling what would we have talked about?

ERM BEST PRACTICES

- ERM is first and foremost about effectively managing capital. Second it's about encouraging and supporting risk-based decisions making. And third, it's about supporting and encouraging a risk-aware culture.**

**Zurich USA, Chief Risk Officer, Barry Franklin

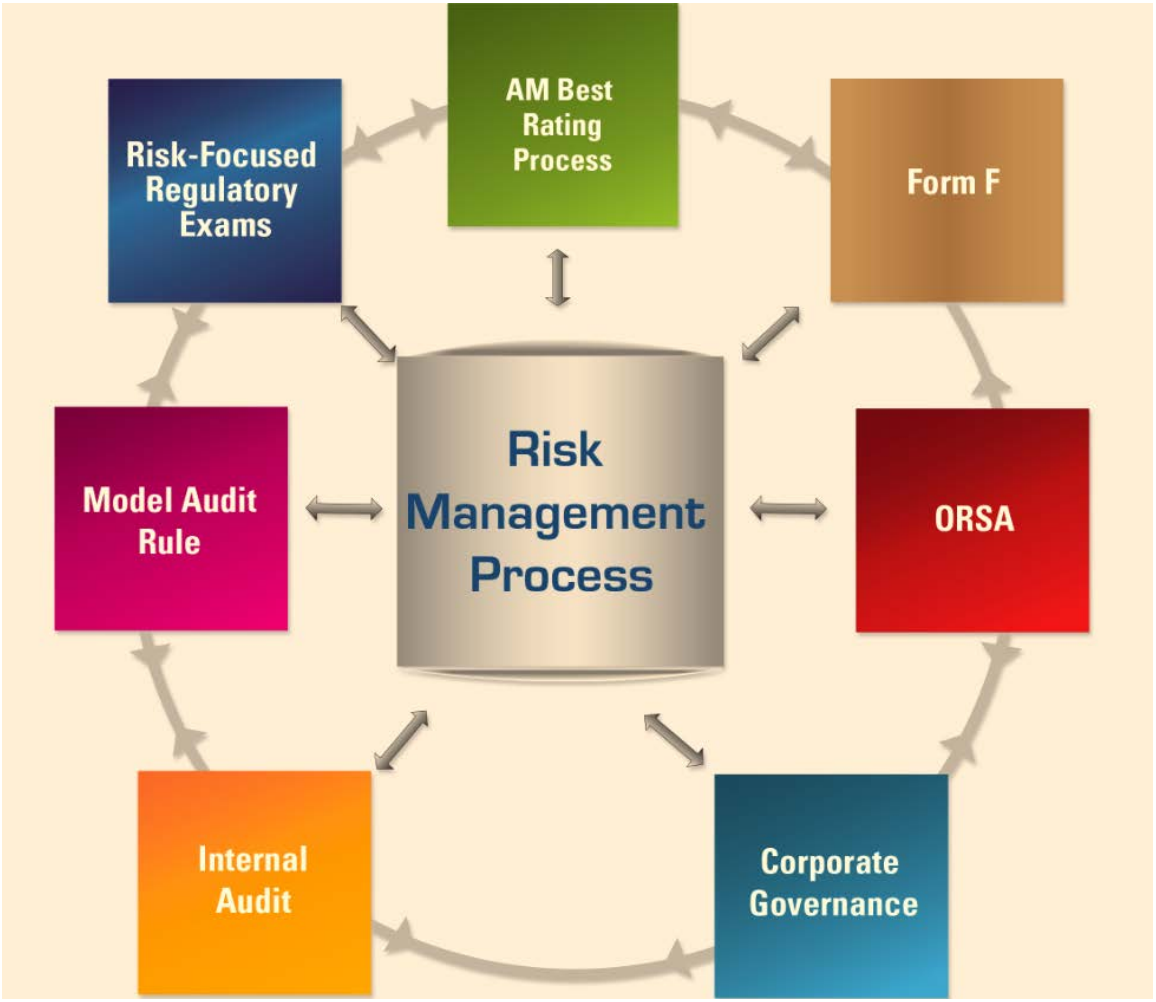
"Great companies will have great Corporate Governance and ERM Frameworks. The others will be left behind."

Steve J. Johnson, Deputy Insurance Commissioner, Office of Corporate and Financial Regulation, Pennsylvania Department of Insurance, September 30, 2014, Insurance Regulatory Update, PAMIC Conference

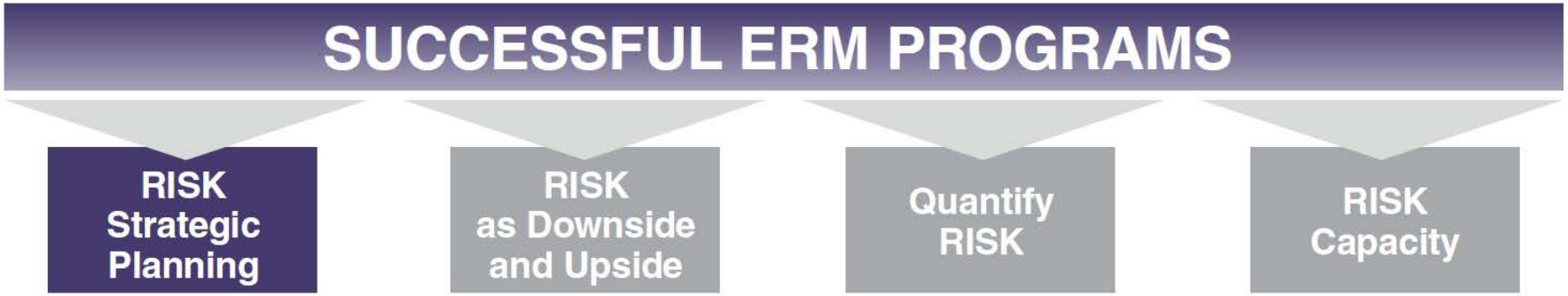
Benefits of ERM Framework

- Maximize value to the organization's various stakeholders
- Manage exposure to potential earnings and capital volatility
- Create a risk-aware culture that encourages risk-taking
- Develop consistent metrics to measure risk and to establish risk tolerance levels
- Assign roles and responsibilities to board, senior management and others
- Maintain excellent rating from rating agencies
- Satisfy regulatory requirements

The Foundation of the Recent Regulatory Requirements



ERM BEST PRACTICES



*CTC Guide to Enterprise Risk Management, Beyond Theory: Practitioner Perspectives on ERM.

ERM Success Tips

- There’s no single way to do this
- Buy in from the top
- Keep it fresh
- Get the right champion
- Set up the right ERM structure
- Condense the information
- Learn from others
- Be realistic about timing

ERM BEST PRACTICES, continued

- The starting point is asking – “How risks can affect the objectives and strategies of the organization.”
  - In the context of our products, services and strategic plan, what are the big risk factors that would make it difficult to be successful?
- The output is a list of risks.

CTC Guide to Enterprise Risk Management, Beyond Theory: Practitioner Perspectives on ERM.

Key Areas to Include

- Risk Appetite – amount and type of risk that an organization is willing to pursue or retain in pursuit of its mission.
  - Reflective of strategy, risk strategies and stakeholder expectations
  - Set and endorsed by board of directors through discussions with management

- Risk Tolerance – The amount of risk an organization is willing to accept in the aggregate (or within a certain business unit or a specific risk category)
  - Expressed in quantitative terms that can be monitored
  - Often expressed in acceptable/unacceptable outcomes or levels of risk

Event Identification

- Key Risk Categories
  - Credit
  - Market
  - Underwriting
  - Operational
  - Strategic

Risk-Focused Regulatory Examinations

Critical Risk Categories

- The 10 critical risk categories (valuation, liquidity, investment strategy, reinsurance adequacy and collectability, underwriting, reserve data and adequacy, related parties, and capital management) of a RFRE are included in the event identification of ERM.

Risk-focused Regulatory Examinations

- Moving to minimum of 10 critical risk categories to reduce the scope of work
  1. Valuation/Impairment of Complex of Subjectively Valued Invested Assets
  2. Liquidity Considerations
  3. Appropriateness of Investment Portfolio and Strategy
  4. Appropriateness/Adequacy of Reinsurance Program
  5. Reinsurance Reporting and Collectability
  6. Underwriting and Pricing Strategy/Quality
  7. Reserve Data
  8. Reserve Adequacy
  9. Related Party/Holding Company Considerations
  10. Capital Management

AM Best Risk Framework

Credit	Market	Underwriting	Operational	Strategic
Default	Equities	UW Process	Monetary	Competition
Downgrade	Other Assets	Pricing	Reporting	Demographics
Disputes	Currency	Reserves	Legal	Publicity
Settlement	Concentration	Prodct Design	Distribution	Rating
Sovereign	Basis	Basis	IT Systems	Demands
Concentration	Reinvestment	Frequency	Regulatory	Regul Capital
	Liquidity	Severity	Training	Availability
	ALM	Lapse	Turnover	Technological
	Interest Rates	Longevity	Data Capture	
		Mortality/Morb		
		Optionality		
		Concentration		
		Economy		

Actuarial Key Risk Factors/Controls

- Enterprise risks
  - Model risk and control
    - Models must be in compliance with all Actuarial Standards of Practice (ASOPs)
    - Appropriateness of the assumptions made in the calculations
    - Defined and documented process for each periodic review
    - Back-test the results (actual verses expected analyses)
    - Transparency of assumptions and limitations to key stakeholders (communications)

Actuarial Key Risk Factors/Controls

- Enterprise risks (cont.)
  - Economic and pricing risk
    - Price monitoring system – data reconciliation and frequency of review
    - Development of pricing assumptions
    - Treatment of differing characteristics of insured risks
    - Feedback loop on actual performance compared to pricing objectives
  - Regulatory compliance
    - Preparation and analysis for new and emerging regulatory changes
    - Compliance

Practical Approach

Discussion

Group Question?

- What type of quantitative analysis is your company doing?

Quantitative Analyses

- Deterministic
- Scenario Analysis
- Stochastic
- Stress Testing and Scenario Analysis
- Economic Capital Modeling

Stress Testing and Scenario Analysis

- A *scenario* describes a consistent future state of the world over time, resulting from a plausible and possibly adverse set of events or sequences of events. A *stress test* provides an assessment of an extreme scenario, usually with a severe impact on the firm, reflecting the inter-relations between its significant risks.

- Together, they complement the use of economic capital models that apply probabilities to possible future scenarios to determine appropriate capital needs of a firm. In contrast to internal models, scenario analysis and stress testing assess the financial effect of the events or sequence of events that lead to specific scenarios in adequate detail so that their causes can be identified and their effects on the firm can be understood. Thus, they can be used to enhance the understanding of if and why a firm is vulnerable to highly uncertain tail risks.

Financial Models Supporting ERM

- Economic Capital Model (ECM) and ERM
  - Cornerstone of ERM
  - ECM applies economic principles in concert with company's own risk profile for estimation purposes
  - Uses stochastic methods to model possible outcomes for insurer financials
  - Permits detailed measurements of the impact of business segments on overall risk
  - Can be used to measure compliance with Solvency II standard of solvency (99.5% probability of solvency over one year time horizon)
  - Requires significant expertise to effectively apply model

Risk Tolerance Level Examples

- Economic Capital Model – Probability of ruin at 99.5% VaR, one-year out
- Minimum best capital adequacy ratio, one year out to achieve/maintain A- rating
- NAIC risk based capital less than 300
- Net written premium to surplus ratio of greater than 1.5 to 1
- No greater than a 10% loss of capital from all risk factors in any one year
- Holding Company debt to total capitalization ratio

Own Risk Solvency Assessment

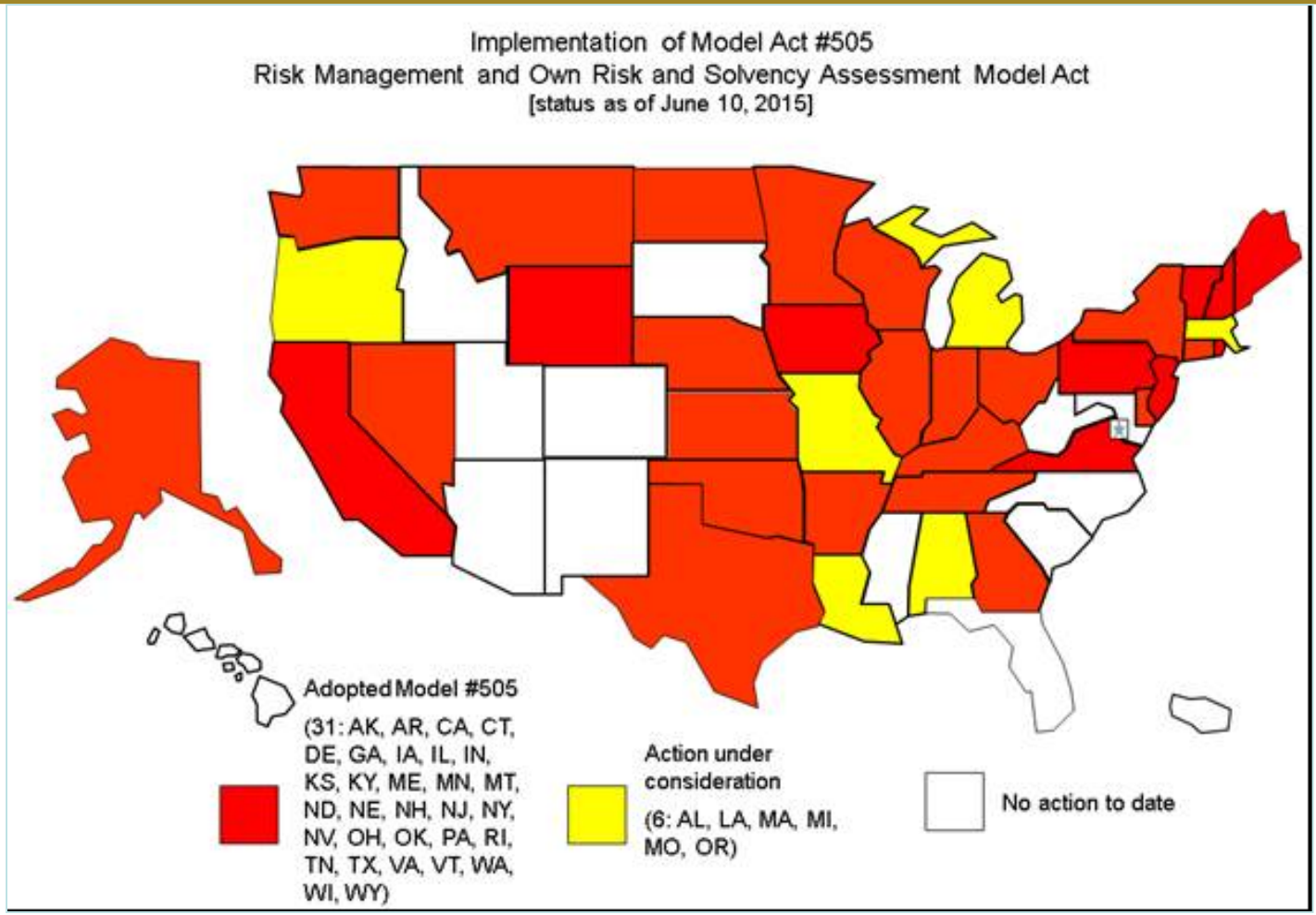
A component of an insurer's enterprise risk management (ERM) framework, is a confidential internal assessment appropriate to the nature, scale and complexity of an insurer conducted by the insurer of the material and relevant risks identified by the insurer associated with an insurer's current business plan and the sufficiency of capital resources to support those risks.

Goals of ORSA

- Ensure all insurers have “an effective level of ERM through which material and relevant risks are identified using techniques appropriate to the nature, scale and complexity of the company’s operations, in a manner adequate to support risk and capital decisions”; and

- Provide support to the existing legal entity view of group-level perspective on risk and capital.

Implementation of NAIC ORSA Model Act by State



ORSA Report Sections

- Section 1- Description of Insurer's Risk Management Framework
  - Risk Culture and Governance
  - Risk Identification and Prioritization
  - Risk Appetite, Tolerances and Limits
  - Risk Management and Controls
  - Risk Reporting and Communication
- Section 2 – Insurer's Assessment of Risk Exposure
  - For each material risk category in Section 1, provide quantitative and/or qualitative measurement of risk exposure in both normal and stressed environments using risk techniques appropriate to the insurer's specific risk profile.

ORSA Report Sections, Continued

- Section 3 – Group Risk Capital and Prospective Solvency Assessment
  - Document how the company combines risk assessment and risk management to determine level of financial resources needed to manage business over long term business cycle.
  - Demonstrate the company has capability to execute a 3 to 5 year business plan, given current capital requirements and result of normal and stressed environments.
  - If the company's surplus cannot support 3 to 5 year plan, explain what actions will be taken to resolve capital adequacy.

ORSA Section 3 – Group Risk Capital and Prospective Solvency Assessment

Group Risk Capital Assessment

- Broadly defined as the testing of aggregate available capital against the various risks which may adversely affect the enterprise.
- Goal of such an exercise is to determine that a given level of capital is sufficient to withstand the various risks, individually and collectively, up to some defined security standard or risk appetite.
- The level of capital that just satisfies the security standard can be defined as “risk capital,” and can be compared to “available capital” to ascertain the degree of capital adequacy, including “excess” or “deficit” capital.

ORSA Section 3 – Group Risk Capital and Prospective Solvency Assessment

Group Risk Capital Assessment (cont'd)

- Insurers should have sound processes for assessing capital adequacy in relation to their risk profile and the process should be integrated into its management and decision making culture.

- On an annual basis, the insurer subject to this reporting requirement should provide a group risk capital assessment within its ORSA Summary Report for the previous period.

ORSA Section 3 – Group Risk Capital and Prospective Solvency Assessment

Definition of Economic Capital

- Sufficient surplus to cover adverse outcomes or to meet a business objective.
- With a given level of risk tolerance.
- Over a specified period of time.

ORSA Section 3 – Group Risk Capital and Prospective Solvency Assessment

Definition of an Economic Capital Model (ECM)

- One primary tool to assess risk in an insurance organization
  - Simulates the internal operations of the company relative to the external environment within which it is operating.
  - Indicates future levels and volatility of profitability, and
  - Estimates appropriate amounts of capital to hold.

ORSA Section 3 – Group Risk Capital and Prospective Solvency Assessment

ECM Can ….

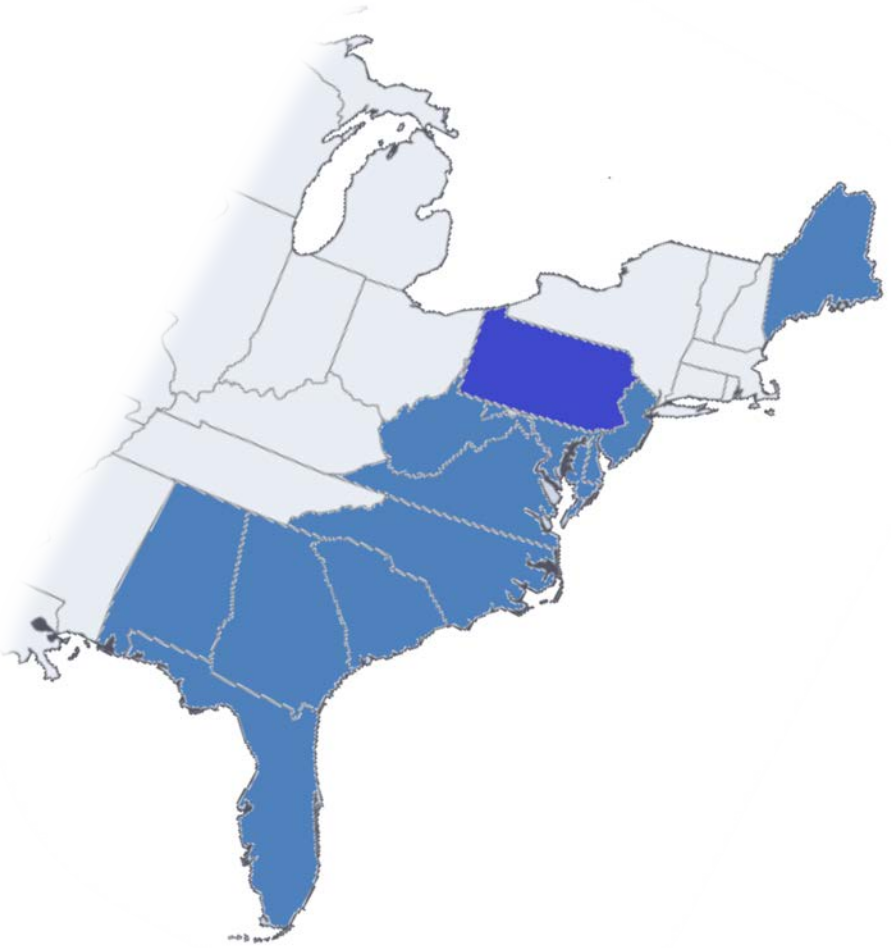
- Model
  - Company or Product Risk Profiles
  - Risk Tolerance, Constraints & Strategies
  - Insurance Pricing & Business Strategies
  - Performance Measurements
  - Capital Adequacy & Budgeting
  - Incentive Compensation
  - Investment & Risk-Adjusted Rates of Return
  - Merger & Acquisition Pricing Details
  - Capital Allocation Among Business Units

Section 5:
ECM Case Study
Happy Valley Insurance Company

Background Information

Line of Businesses:
General Liability
Workers' Compensation
Property
Miscellaneous

Writes Commercial Lines in 13 States on the East Coast



Base Case – Liabilities & Surplus

As of 12/31/2014	
Liabilities	**Values**
Net L&LAE Reserve	$ 22.75 M
Net UEPR	$ 23.10 M
Other Liabilities	$ 4.72 M
Total Liabilities	**$ 50.57 M**
Capital & Surplus	**$ 20.87 M**
Liabilities & Surplus	**$ 71.44 M**

Base Case – Assets by Class

As of 12/31/2014	
Assets	**Values**
Bonds	$ 43.40 M
Stocks	$ 1.25 M
Cash	$ 5.50 M
Other Invested	$ 0.30 M
Total Invested	**$ 50.45 M**
Uncollected Premium	$ 17.00 M
Other Assets	$ 4.00 M
Total Assets	**$ 71.45 M**

Base Case – Earned Premium 2015

Earned During 2015			
Lines of Business	**Gross EP**	**Ceded EP**	**Net EP**
General Liability	$ 6.40 M	$ 0.60 M	$ 5.80 M
Workers' Compensation	$ 3.70 M	$ 1.00 M	$ 2.70 M
Property	$ 35.90 M	$ 11.00 M	$ 24.90 M
All Other	$ 7.00M	$ 3.00M	$ 4.00M
Total All Lines	**$ 53.00 M**	**$ 15.60 M**	**$ 37.40 M**

Reinsurance Program

Reinsurance For All Years 2015 - 2019	
Line of Business	**Base Case Retention**
General Liability	$1.10 M
Workers' Comp	$0.50 M
Property Per Risk	$0.50 M
Line of Business	**Catastrophe Layers**
Property Cat	$ 4.00 M X/S $ 6.00 M
	$10.00 M X/S $10.00 M
	$20.00 M X/S $20.00 M
	$40.00 M X/S $40.00 M

Base Case - ECM Results

Surplus at Various Confidence Intervals		
Probability	**2015 VaR**	**2019 VaR**
0.010%	$ (7.49) M	$ (27.03) M
0.079%	$ 0 M	$ (14.46) M
0.491%	$ 7.16 M	$ 0 M
0.500%	$ 7.21 M	$ 0.09 M
50.000%	$ 23.53 M	$ 32.29 M
75.000%	$ 24.57 M	$ 36.60 M
99.000%	$ 26.39 M	$ 43.68 M
99.500%	$ 26.62 M	$ 44.48 M
Mean	$ 22.58 M	$ 30.81 M
Year - End 2014 Surplus		$ 20.87 M

Solvency II Standard

Results of 100,000 Monte Carlo Simulations

Comparison of Investment Distribution

Investment Percentage			
Assets	**Yield**	**Base Case**	**Alternative**
Bonds	2.50%	60.70%	**45.00%**
Stocks	0.00%	1.70%	**3.50%**
MLP's	6.00%	0.00%	**14.00%**
Cash	0.10%	7.70%	7.70%
Other	0.00%	29.90%	29.80%
Total		**100.00%**	**100.00%**

Alternative Investments

Surplus at Various Confidence Intervals		
Probability	**2015 VaR**	**2019 VaR**
0.010%	$ (6.91) M	$ (27.15) M
0.080%	$ 0 M	$ (13.01) M
0.340%	$ 6.27 M	$ 0 M
0.500%	$ 7.45 M	$ 2.41 M
50.000%	$ 23.75 M	$ 34.78 M
75.000%	$ 25.10 M	$ 39.69 M
99.000%	$ 28.08 M	$ 49.75 M
99.500%	$ 28.56 M	$ 51.15 M
Mean	$ 22.99 M	$ 33.64 M
Year - End 2014 Surplus		$ 20.87 M

Solvency II Standard

**Results of 100,000 Monte Carlo Simulations*

Buys Auto Insurer - ECM Results Including Goodwill

Surplus at Various Confidence Intervals		
Probability	**2015 VaR**	**2019 VaR**
0.010%	$ (6.97) M	$ (24.38) M
0.074%	$ 0 M	$ (12.19) M
0.313%	$ 6.13 M	$ 0 M
0.500%	$ 7.73 M	$ 2.99 M
50.000%	$ 23.87 M	$ 34.24 M
75.000%	$ 24.94 M	$ 38.56 M
99.000%	$ 26.81 M	$ 45.76 M
99.500%	$ 27.04 M	$ 46.53 M
Mean	$ 22.94 M	$ 32.86 M
Year - End 2014 Surplus		$ 20.87 M

Solvency II Standard

**Results of 100,000 Monte Carlo Simulations*

Comparison of Reinsurance Program

Reinsurance For All Years 2015 - 2019		
Line of Business	**Base Case Retention**	**Alternative Retention**
General Liability	$1.10 M	**$2.20 M**
Workers' Comp	$0.50 M	$0.50 M
Property Per Risk	$0.50 M	**$1.00 M**
Line of Business	**Catastrophe Original Layers**	**Catastrophe Alternative Layers**
Property Cat	$ 4.00 M X/S $ 6.00 M	**$10.00 M Retention**
	$10.00 M X/S $10.00 M	$10.00 M X/S $10.00 M
	$20.00 M X/S $20.00 M	$20.00 M X/S $20.00 M
	$40.00 M X/S $40.00 M	$40.00 M X/S $40.00 M

Alternative Reinsurance - ECM Results

Surplus at Various Confidence Intervals		
Probability	**2015 VaR**	**2019 VaR**
0.010%	$ (11.81) M	$ (31.88) M
0.166%	$ 0 M	$ (9.60) M
0.500%	$ 4.65 M	$ (1.04) M
0.588%	$ 5.31 M	$ 0 M
50.000%	$ 24.48 M	$ 37.19 M
75.000%	$ 25.53 M	$ 42.23 M
99.000%	$ 27.35 M	$ 50.48 M
99.500%	$ 27.58 M	$ 51.41 M
Mean	$ 23.32 M	$ 35.43 M
Year - End 2014 Surplus		$ 20.87 M

Solvency II Standard

Results of 100,000 Monte Carlo Simulations

$1.8 M Dividend Per Year - ECM Results

Solvency II Standard

Surplus at Various Confidence Intervals		
Probability	**2015 VaR**	**2019 VaR**
0.010%	$ (9.29) M	$ (38.10) M
0.100%	$ 0 M	$ (22.44) M
0.500%	$ 5.41 M	$ (10.74) M
2.480%	$ 11.08 M	$ 0 M
50.000%	$ 21.73 M	$ 23.06 M
75.000%	$ 22.77 M	$ 27.39 M
99.000%	$ 24.59 M	$ 34.45 M
99.500%	$ 24.82 M	$ 35.25 M
Mean	$ 20.78 M	$ 21.44 M
Year - End 2014 Surplus		$ 20.87 M

Results of 100,000 Monte Carlo Simulations

Comparison of Key Metrics for Scenarios

Scenarios	1	2	3	4	5
Key Metrics	Base Case	Alternative Investment	Buy Auto Insurer	Alternative Reinsurance	Pay $1.8 M Dividends
2015 BCAR	257.13%	262.53%	238.37%	255.82%	234.02%
2019 BCAR	271.77%	287.90%	262.39%	283.02%	199.51%
1 Yr Prob. of Ruin	0.08%	0.08%	0.07%	0.17%	0.10%
5 Yr Prob. of Ruin	0.49%	0.34%	0.31%	0.59%	2.48%
12/31/2014 Surplus (M)	$20.87	$20.87	$20.87	$20.87	$20.87
12/31/2019 Surplus (M)	$30.81	$33.64	$32.86	$35.43	$21.44
5 Yr Annual Adj. ROE	8.10%	10.02%	9.50%	11.16%	9.18%

Initial Capital Allocation Using Net 99% VaR

Initial Allocation of Year-End 2014 Surplus at 99% VaR			
LOB	99% VaR	Percent of Total	Capital Allocation
Casualty	$ 4.221 M	13.69%	$ 2.857 M
Workers' Compensation	$ 1.900 M	6.16%	$ 1.286 M
All Other	$ 2.551 M	8.27%	$ 1.727 M
Property	$ 22.165 M	71.88%	$ 15.003 M
Total	$ 30.837 M	100.00%	$ 20.873 M

Initial Capital Allocation Using Net 50% VaR

Initial Allocation of Year-End 2014 Surplus at 50% VaR			
LOB	50% VaR	Percent of Total	Capital Allocation
Casualty	$ 2.335 M	12.83%	$ 2.679 M
Workers' Compensation	$ 1.504 M	8.27%	$ 1.726 M
All Other	$ 0.905 M	4.97%	$ 1.038 M
Property	$ 13.452 M	73.93%	$ 15.431 M
Total	$ 18.197 M	100.00%	$ 20.873 M

ORSA In Action

Discussion

Corporate Governance

- Annual Corporate Governance Disclosure
  - Anticipate to be effective for 2016
  - All Companies will need to file

Key Components of Corporate Governance

- Governance Framework & Structure
- Policies and Practices of Board of Directors and Board Committees
- Policies and Practices for Directing Senior Management
- Oversight of Critical Risk Areas

Practical Approach

Discussion

Questions?

Did we answer the questions?

Additional Questions?

DRAWING

- Name
- Company Name
- Phone number
- Email Address

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