Reserving for Individual Reinsurance Contracts

2010 Casualty Loss Reserve Seminar

Paul A. Vendetti, FCAS, MAAA
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What are Loss Reserves

- **All numbers are for demonstration purposes only.**

- **Do not use for actual work.**

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What are Loss Reserves

- **Loss reserves include:**
  - Reported case reserves
  - Additional case reserves
  - IBNR
  - Loss and loss adjustment expense
  - Note many times the actual definitions can overlap

- **Loss reserves do not include:**
  - Profit share commissions
  - Experience based premium adjustments
  - Other balance sheet items
  - Loss reserves do impact these items

- **Scope of SAO does not include other balance sheet items**

Actuarial Perspective

- **Why review individual contracts:**
  - Unusual terms and conditions
    - Loss ratio caps
    - Loss corridors
    - High layer excess of loss
    - Experienced based premium adjustments
    - Commutation clauses
    - Loss adjustment expense (limits inclusion, pro rata, excluded)
    - Cession of specific exposure

  - Unusual or specific (and identifiable) exposure
    - Natural or man-made catastrophe
    - Exposure to financial meltdown
    - Latent liability exposure

  - Large individual contract
    - Contract is significant
    - Data is credible for individual review

Actuarial Loss Development Methods

- **Incurred loss development**
  - Loss development from various source
    - Cedent
    - Reinsurer
    - Industry benchmarks (AM Best, RAA etc…)

- **Paid loss development**
  - Similar to incurred development
  - Care should be taken since payment of losses can be very slow

- **Expected loss**
  - Source can be pricing information

- **Bornhuetter Ferguson (BF)**
  - Mixes incurred development and expected loss

Treaty Types to Discuss

- **Prorata:**
  - Quota Share
  - Surplus Share

- **Casualty Excess of Loss:**
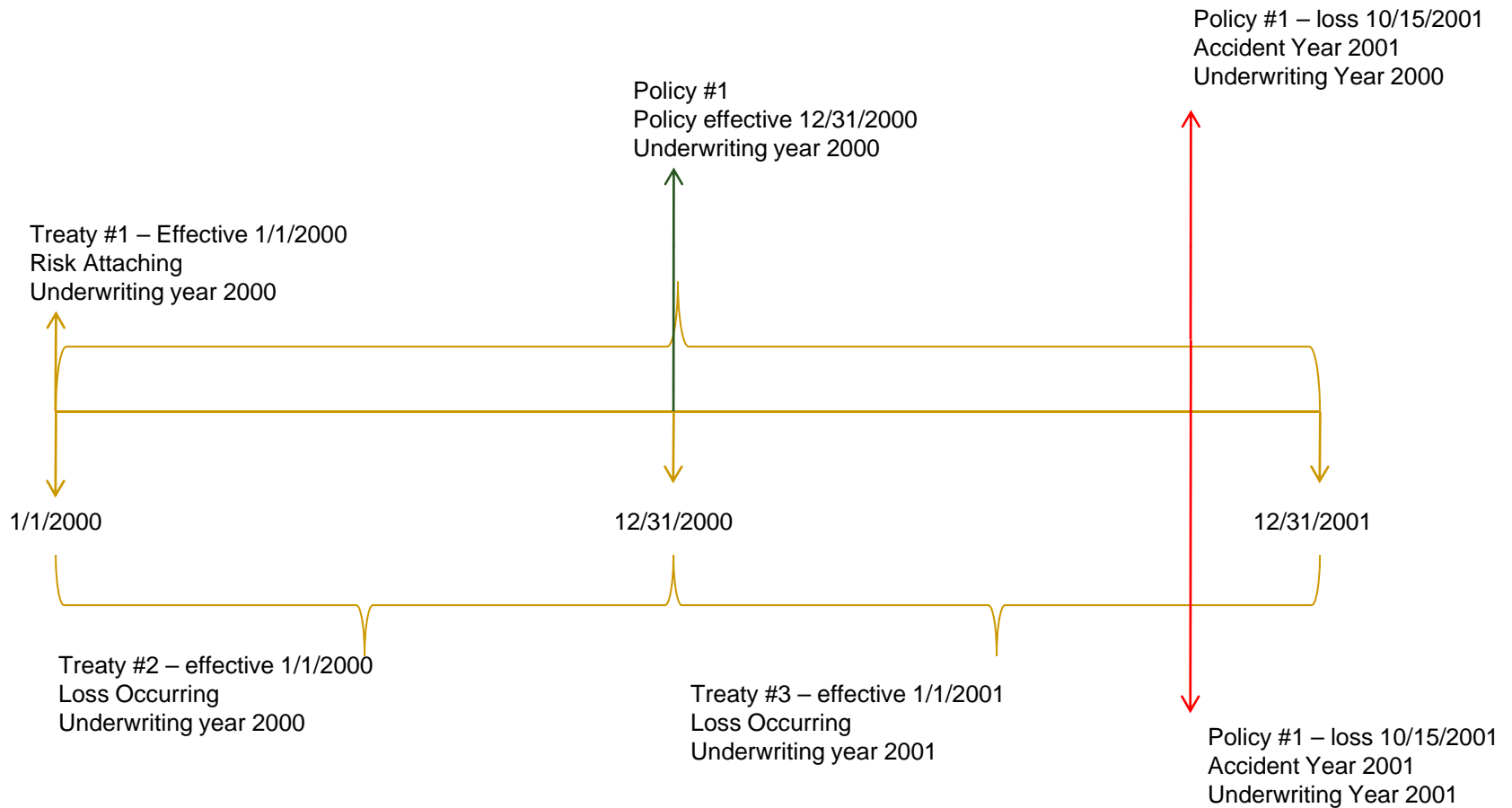 - Working layers
  - High excess layers

- **Catastrophe Excess of Loss:**
  - Individual event covers
  - Range of potential outcomes within the layer

- **Industry Loss Warranties:**
  - Individual event covers
  - All or nothing payment

- **Aggregate Excess of Loss:**
  - Account for all inuring reinsurance contracts

Data Organization

Risk Attaching vs. Loss Occurring
Underwriting Year vs. Accident Year

Policy #1 – loss 10/15/2001
Accident Year 2001
Underwriting Year 2000

Policy #1
Policy effective 12/31/2000
Underwriting year 2000

Treaty #1 – Effective 1/1/2000
Risk Attaching
Underwriting year 2000

1/1/2000   12/31/2000   12/31/2001

Treaty #2 – effective 1/1/2000
Loss Occurring
Underwriting year 2000

Treaty #3 – effective 1/1/2001
Loss Occurring
Underwriting year 2001

Policy #1 – loss 10/15/2001
Accident Year 2001
Underwriting Year 2001

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Pro-rata Treaties

- **General Characteristics**
  - Reinsurer follows the fortune of the ceding company. Quota loss ratio is the same for cedent and reinsurer.
  - Credibility of ceded data less important because;
  - In many instance primary data can be used for projecting loss ratios, and loss development
  - Most cases is a risk attaching cover

- **Considerations**
  - Treaty terms
    - Loss ratio caps and corridors
    - Catastrophe loss limits
  - Reporting delays (international exposure can have longer reporting delays)

- **Pitfalls**
  - Risk attaching vs. Loss occurring (make sure you are comparing apples to apples) can impact loss development factors and premiums used to project losses
  - Data is underwriting year vs. accident year

Quota Share Example

- **Contract Assumptions**
    - General liability occurrence exposure
    - 40% cession
    - 25% ceding commission
    - 100% loss ratio net of ceding commission
    - Three years underwriting years of experience, do not have information to develop underwriting year triangles
    - Risk attaching
    - Asbestos loss limited to $15,00,000
    - Include DCC

- **Data available**
    - Ceding company's annual statement
    - Underwriting year losses and premium
    - One claim for asbestos for $15,000,000

Workers Compensation
Direct excl. Asbestos
Industry Loss Development from Best's Aggregates & Averages
Schedule P Data (as of 12/31/2008) in millions

Evaluation Point (in months)

Reported Losses + DCC

Accident Year	12	24	36	48	60	72	84	96	108	120	Ult
1999	10,985	15,706	18,089	19,571	20,490	21,026	21,539	21,768	22,051	22,284	22,418
2000	11,649	17,326	19,805	21,207	22,230	22,720	23,081	23,457	23,603	23,852	23,996
2001	12,790	18,624	21,577	22,917	23,384	23,874	24,294	24,734	24,971	25,235	25,386
2002	12,639	18,749	21,465	22,534	23,290	23,811	24,336	24,702	24,939	25,202	25,354
2003	13,290	18,930	21,171	22,311	23,128	23,911	24,389	24,755	24,992	25,256	25,408
2004	13,251	18,105	20,150	21,246	22,121	22,675	23,128	23,476	23,701	23,951	24,095
2005	13,538	17,820	19,860	21,172	21,973	22,524	22,974	23,319	23,543	23,791	23,934
2006	13,558	18,515	21,159	22,486	23,336	23,922	24,400	24,766	25,004	25,268	25,419
2007	14,051	19,628	22,295	23,693	24,589	25,205	25,709	26,095	26,345	26,624	26,783
2008	14,167	20,032	22,754	24,180	25,095	25,724	26,238	26,632	26,888	27,172	27,335

Report-to-Report Development Factors

Accident Year	12 24	24 36	36 48	48 60	60 72	72 84	84 96	96 108	108 120	120 Ultimate
1999	1.4298	1.1517	1.0819	1.0470	1.0262	1.0244	1.0106	1.0130	1.0106	
2000	1.4874	1.1431	1.0708	1.0482	1.0220	1.0159	1.0163	1.0062		
2001	1.4561	1.1585	1.0621	1.0204	1.0210	1.0176	1.0181			
2002	1.4834	1.1449	1.0498	1.0335	1.0224	1.0221				
2003	1.4244	1.1184	1.0539	1.0366	1.0338					
2004	1.3664	1.1130	1.0544	1.0412						
2005	1.3163	1.1145	1.0661							
2006	1.3656	1.1428								
2007	1.3969									
Avg	1.4140	1.1359	1.0627	1.0378	1.0251	1.0200	1.0150	1.0096	1.0106	1.0060
LDF To Ult.	1.9295	1.3646	1.2013	1.1305	1.0893	1.0626	1.0418	1.0264	1.0166	1.0060
% of Ult.	51.83%	73.28%	83.24%	88.46%	91.81%	94.11%	95.99%	97.43%	98.36%	99.40%

Workers Compensation
Direct excl. Asbestos
Industry Loss Development from Best's Aggregates & Averages
Schedule P Data (as of 12/31/2008) in millions

Accident Year Loss Development Factors

Accident Year	Earned Premium	Reported Loss	% to Ult	Act Cent Est
2000	26,239	23,603	98.36%	23,996
2001	30,721	24,734	97.43%	25,386
2002	36,137	24,336	95.99%	25,354
2003	41,849	23,911	94.11%	25,408
2004	46,476	22,121	91.81%	24,095
2005	47,409	21,172	88.46%	23,934
2006	47,290	21,159	83.24%	25,419
2007	44,532	19,628	73.28%	26,783
2008	41,309	14,167	51.83%	27,335

Accident Year Loss Development Factors applied to Underwriting Year Data

Underwriting Year	Earned Premium	Reported Loss	% to Ult	Indicated Act Cent Est	Act Cent Est	Difference
2000	28,480	24,168	98.36%	24,570	24,691	(121)
2001	33,429	24,535	97.43%	25,183	25,370	(187)
2002	38,993	24,124	95.99%	25,132	25,381	(249)
2003	44,162	23,016	94.11%	24,457	24,751	(295)
2004	46,942	21,646	91.81%	23,578	24,015	(436)
2005	47,349	21,166	88.46%	23,927	24,677	(750)
2006	45,911	20,394	83.24%	24,500	26,101	(1,602)
2007	42,920	16,897	73.28%	23,057	27,059	(4,002)
2008	20,655	7,083	51.83%	13,667	13,667	0

Underwriting Year Loss Development Factors applied to Underwriting Year Data

Underwriting Year	Earned Premium	Reported Loss	% to Ult	Indicated Act Cent Est	Act Cent Est	Difference
2000	28,480	24,168	97.88%	24,691	24,691	0
2001	33,429	24,535	96.71%	25,370	25,370	0
2002	38,993	24,124	95.05%	25,381	25,381	0
2003	44,162	23,016	92.99%	24,751	24,751	0
2004	46,942	21,646	90.14%	24,015	24,015	0
2005	47,349	21,166	85.77%	24,677	24,677	0
2006	45,911	20,394	78.13%	26,101	26,101	0
2007	42,920	16,897	62.45%	27,059	27,059	0
2008	20,655	7,083	51.83%	13,667	13,667	0

Assume premium is earned uniformly throughout the year.
Losses occur uniformly throughout the year.

Workers Compensation
Direct
Industry Loss Development from Best's Aggregates & Averages
Underwriting Year Development Factors
Reported Losses

Months of Maturity	Accident Year	2008 27,335	2007 26,783	2006 25,419	2005 23,934	Accident Year 2004 24,095	2003 25,408	2002 25,354	2001 25,386	2000 23,996	Sum of Reported Loss at Yr End	Expected Ult Losses at Yr End	Underwriting Year % to Ultimate
12	51.83%	14,167									14,167	27,335	51.83%
24	73.28%	14,167	19,628								33,795	54,118	62.45%
36	83.24%		19,628	21,159							40,787	52,203	78.13%
48	88.46%			21,159	21,172						42,331	49,353	85.77%
60	91.81%				21,172	22,121					43,293	48,029	90.14%
72	94.11%					22,121	23,911				46,031	49,503	92.99%
84	95.99%						23,911	24,336			48,247	50,761	95.05%
96	97.43%							24,336	24,734		49,070	50,740	96.71%
108	98.36%								24,734	23,603	48,337	49,382	97.88%

Workers Compensation
Net
Industry Loss Development from Best's Aggregates & Averages
Schedule P Data (as of 12/31/2008) in millions

Underwiting Year	Earned Premium	Ceding Commission	Net Earned Premium	Reported Loss	Act Cent Est	Capped A&E Reported Loss	Net Ult. Uncapped Treaty Loss	Projected Loss Ratio Net of CC	Capped Loss Ratio Net of CC	Ultimate Ceded Treaty Loss	Ceded Treaty IBNR
2006	18,364	4,591	13,773	8,157	10,441		10,441	75.8%	75.8%	10,441	2,283
2007	17,168	4,292	12,876	6,759	10,824	5,000	15,824	122.9%	100.0%	12,876	1,117
2008	8,262	2,065	6,196	2,833	5,467		5,467	88.2%	88.2%	5,467	2,634

All numbers are net of 40% cession.
Ceding Commission 25%
Assume $5,000,000 asbestos claims from UY 2007
100% loss ratio cap applies after the $5 million asbestos limit and net of ceding commision

Casualty Excess of Loss Treaties

- **General Characteristics**
  - Loss will be different between primary and reinsurer
  - Credibility of ceded data very important because;
  - There can be a low claim volume especially in high excess layers
  - Most cases is a loss occurring cover

- **Considerations**
  - Working layer vs. High excess of loss treaties
    - Frequency of claims
  - Data is typically provided on an accident year basis
  - Expected losses based upon pricing analysis

- **Pitfalls**
  - Paid losses develop is not very useful
  - Long tailed nature of the line
  - Use of benchmark data may not correspond to actual exposure underlying the data
  - Pricing analysis may not be correct

Workers Compensation
Losses Excess of $500,000
Industry Loss Development from Best's Aggregates & Averages
Schedule P Data (as of 12/31/2008) in millions

Accident					Evaluation Point (in months)						
Year	12	24	36	48	60	72	84	96	108	120	Ult
					Reported Losses + DCC						
1999	0	933	1,550	1,826	2,069	2,888	3,255	3,563	3,798	4,009	4,149
2000	7	49	68	82	87	120	140	154	163	172	178
2001	1,023	829	1,343	1,749	2,188	2,390	2,802	3,036	3,222	3,401	3,520
2002	378	505	480	743	938	1,002	1,157	1,265	1,342	1,417	1,466
2003	282	190	422	533	730	747	861	942	1,000	1,055	1,092
2004	393	731	798	1,144	1,462	1,744	2,012	2,201	2,335	2,464	2,551
2005	230	567	771	1,049	1,285	1,532	1,768	1,934	2,052	2,165	2,241
2006	349	320	316	420	515	614	708	774	822	867	898
2007	56	162	229	304	372	444	512	561	595	628	650
2008	821	1,856	2,619	3,478	4,260	5,081	5,862	6,412	6,803	7,181	7,432

					Report-to-Report Development Factors					
Accident	12	24	36	48	60	72	84	96	108	120
Year	24	36	48	60	72	84	96	108	120	Ultimate
1999		1.6620	1.1776	1.1331	1.3959	1.1271	1.0945	1.0661	1.0555	
2000	7.1201	1.3897	1.2121	1.0552	1.3854	1.1607	1.1034	1.0559		
2001	0.8103	1.6199	1.3025	1.2512	1.0921	1.1726	1.0836			
2002	1.3377	0.9502	1.5484	1.2624	1.0681	1.1542				
2003	0.6729	2.2265	1.2629	1.3699	1.0221					
2004	1.8576	1.0925	1.4336	1.2776						
2005	2.4664	1.3596	1.3596							
2006	0.9158	0.9882								
2007	2.8931									
Avg	2.2592	1.4111	1.3281	1.2249	1.1927	1.1537	1.0938	1.0610	1.0555	1.0350
LDF To Ult.	9.0476	4.0047	2.8380	2.1370	1.7446	1.4627	1.2678	1.1591	1.0925	1.0350
% of Ult.	11.05%	24.97%	35.24%	46.80%	57.32%	68.37%	78.87%	86.27%	91.54%	96.62%

Workers Compensation
% to Ultimate Comparison
Industry Loss Development from Best's Aggregates & Averages
Schedule P Data (as of 12/31/2008) in millions

Months of	% to Ult	
Maturity	Ground Up	XS $500,000
12	51.8%	11.1%
24	73.3%	25.0%
36	83.2%	35.2%
48	88.5%	46.8%
60	91.8%	57.3%
72	94.1%	68.4%
84	96.0%	78.9%
96	97.4%	86.3%
108	98.4%	91.5%
120	99.4%	96.6%

Workers Compensation
Ceded Losses XS $500,000
Industry Loss Development from Best's Aggregates & Averages
Schedule P Data (as of 12/31/2008) in millions

Accident Year	Subject Premium	Provisional Ceded Premium	Expected Loss	Reported Losses	Reported % to Ult.	Project Ult. Rep Loss	BF	Act Central Est	Loss Ratio	Proj Rate	Additional Return Premium
2000	26,239	1,640	1,200	163	91.5%	178	264	178	10.9%	3.75%	-656
2001	30,721	1,920	1,269	3,036	86.3%	3,520	3,211	3,520	183.3%	8.75%	768
2002	36,137	2,259	1,268	1,157	78.9%	1,466	1,424	1,466	64.9%	6.17%	-29
2003	41,849	2,616	1,270	747	68.4%	1,092	1,148	1,120	42.8%	3.75%	-1,047
2004	46,476	2,905	1,205	1,462	57.3%	2,551	1,976	2,263	77.9%	8.75%	1,162
2005	47,409	2,963	1,197	1,049	46.8%	2,241	1,686	1,963	66.3%	7.51%	597
2006	47,290	2,956	1,271	316	35.2%	898	1,139	1,139	38.6%	3.75%	-1,183
2007	44,532	2,783	1,339	162	25.0%	650	1,167	1,167	41.9%	3.75%	-1,113
2008	41,309	2,582	1,367	821	11.1%	7,432	2,037	2,037	78.9%	8.75%	1,033
Total											-468

Base Rate .0625
   Min 0.0375
   Max 0.0875

Swing rated 1 to 1 at 65%, 62.5% to 67.5%

Catastrophe Excess of Loss Treaties

- **General Characteristics**
  - Loss will be different between primary and reinsurer
  - One event impacting multiple policyholders;
  - Knowledge that event has occurred (sometimes we know event will occur before it even happens), severity unknown

- **Considerations**
  - Portfolio exposed to the loss
  - Industry estimate of losses
  - Modeled losses
  - Expected losses is not helpful in determining ultimate losses

- **Pitfalls**
  - Industry distribution may not match company exposure
  - Modeled losses may not be accurate (model risk, exposure data errors)

Industry Loss Warranty (ILW)

- **General Characteristics**
    - All or nothing payment
    - Covers in most instances catastrophe losses
    - Trigger based upon industry loss (PCS)

- **Considerations**
    - Industry estimate of losses
    - Modeled losses
    - Expected losses is not helpful in determining ultimate losses

- **Pitfalls**
    - Ultimate loss will limit or zero – no over outcome possible

Industry Loss Warranty
California Earthquake
Incurred Losses 6 months after Occurrence

	Industry Reported Loss (Billions)	% to Ultimate	Industry Ultimate Loss	ILW Attachment	Loss Triggered	Ultimate Loss	Booked Reserves
Scenerio 1	1.254	42.9%	2.923	$15	N	$ 0	$5 Million
Scenerio 2a	6.471	42.9%	15.084	$15	Y	$5 Million	????
Scenerio 2b	6.471	43.2%	14.979	$15	N	$ 0	????
Scenerio 3	10.584	42.9%	24.671	$15	Y	$5 Million	$5 Million

ILW terms - $15 Billion attachment, treaty payment $5 Million

Questions

Paul Vendetti

Senior Consulting Actuary

Pinnacle Actuarial Resources, Inc

(309) 807-2312

pvendetti@pinnacleactuaries.com

Pinnacle's website: www.pinnacleactuaries.com

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