Accident & Health Reinsurance—Crazy Cat People

By Ted Clark

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As the old saying goes, "accidents happen" and 2014 has been known for dramatic events that have attracted world attention. Malaysian Airlines, for example, has tragically lost two planes this year and over 550 passengers and crew in extraordinary circumstances. There have been a series of other, smaller, aviation accidents in the news, the most recent of which involved a candidate for the Brazilian presidency. Train derailments, ferry sinkings and bus crashes have made international news, as has an earthquake in Napa Valley, Calif., which fortunately did more damage to wine bottles than human life. Those in the Property & Casualty business will be familiar with the type of damage and liability claims that arise out of these events, and the structure of catastrophic programs generally. However, these concepts may be new to those in the ordinary life (re)insurance business where catastrophe protection and layering of coverage will seem like a strange way to conduct affairs. This may well leave some wondering if we are indeed "crazy CAT people."

Life catastrophe reinsurance protects an insurer against a sudden and/or dramatic loss of life in its portfolio as a result of a covered accident, freak of nature (read earthquake, tsunami or hurricane, etc.) or even a terrorist attack (if not specifically excluded). Accident & Health (A&H) reinsurance companies specialize in this business and it can be very lucrative—at least until it's not. Reinsurance is generally written on a Per-Event basis and is intended to cover loss amounts that exceed a pre-specified total claim figure, and hence termed "excess of loss." There are a few other acronyms and nicknames used, and because we are also dealing with A&H business, these names can be and are used interchangeably—sometimes within a single sentence. Per-Event Catastrophic Excess of Loss is often called CATXOL, CATXL or simply CAT. In the life area, this coverage will typically contain stated life warranties as part of the key terms. The life warranty stipulates that a certain number of individuals must be involved in the accident or loss before any amounts are recoverable. As a result, it may take three, five, 20 or more lives involved in a single incident before claims become eligible for reimbursement. CAT programs can start at any amount and can protect as low as $200,000 or $500,000 per event depending upon the portfolio, and they can provide coverage limits in the hundreds of millions or even billions of dollars. Consequently a

CAT program may be expressed as $4,500,000 in excess of $500,000, subject to three or more lives involved in a single incident. In some instances the life warranty increases as the layers increase as set out in the example in Table 1.

Table 1: Cat Layer examples

Layer	Limit of Coverage	Retention	"Life Warranty"
1	4,500,000	500,000	3
2	5,000,000	5,000,000	3
3	10,000,000	10,000,000	5
4	30,000,000	20,000,000	7
Total	49,500,000	500,000	

This layering or stacking setup is frequently called "vertical" claim coverage because it protects against increases in claim amounts. This is contrasted with "horizontal" claims coverage which is protection against additional claims. In Table 1 the Retention in all layers after Layer 1 is the sum of the **Limit of Coverage** + the **Retention** (of the prior layer), and the maximum possible recovery for any loss is $49,500,000. However, in practice, the maximum limit can incorporate many more layers of coverage, or fewer layers but broader bands of coverage, and go as high as needed. The best way to understand how this works is to consider some claim examples as set out in Table 2.

Assuming that each of the losses submitted exceeds the stated life warranty, the recoveries are basically the amount of the loss, less the retention. If there were only four lives involved in the $25,500,000 loss, for example, then the last two layers of coverage would not respond, or pay out, because the life warranty has not been satisfied. A loss of $60,000,000 would exceed the limit of coverage and any amounts in excess of $50,000,000 would not be recoverable.

There is commonly a limit on the amount of loss that can be submitted under any single life. This is called the "Maximum Any One Life" or "Maximum Any One Person" limit which is referred to as MAOL and MAOP respectively, but sometimes used interchangeably. In addition to the CAT MAOP limits, there can be separate reinsurance purchased to protect individuals within a portfolio, and this reduces the claim submitted to the

Table 2: Cat Claim per Layer examples

				Claim Recovery Amounts		
Layer	Limit of Coverage	Retention	"Life Warranty"	Recovery for a $750,000 Loss	Recovery for a $5.75MM Loss	Recovery for a $25.5MM Loss
1	4,500,000	500,000	3	250,000	4,500,000	4,500,000
2	5,000,000	5,000,000	3	-	750,000	5,000,000
3	10,000,000	10,000,000	5	-		10,000,000
4	30,000,000	20,000,000	7	-		5,500,000
Total	49,500,000	500,000		250,000	5,250,000	25,000,000

CAT. Per-Person Excess of Loss business is referred to by those "in the know" as PPXOL or PPXL. PPXL is a program of reinsurance that protects the ceding company for all losses from a single individual (the "per-person") which exceeds a stipulated dollar value, up to the limit of coverage. The trigger to coverage may be a single life or multiple lives. As in the CAT protection outlined above, PPXL business is frequently written in multiple layers. An example of this is "$300,000 in excess of $200,000, each and every person" and this coverage, subject to all its other terms and conditions, would protect a ceding company from all losses from any individual with claims greater than $200,000, which is the amount retained, up to a further $300,000, being the limit of coverage. Therefore a loss of $355,000 for a covered individual would result in a reinsurance collection of $155,000 (being the loss amount of $355,000 minus the $200,000 retention).

It is not uncommon for both CAT and PPXL protection to be written on a single block of business which is where the explanation, and the associated math, become really interesting. As in reviewing the layers, the best way to understand what happens is to review some claim

Table 3: Per Person Excess of Loss (XOL) Coverage Example. $1.8M excess of $200,000 each and every claim

		A	B	C = A - B	D = A - C	"E = D Total - B Total"	
Claimant	Date of Loss	Amount of Claim	Less: Reinsurance Retention	Per Person Amount Recoverable	Amount Subject to Catastrophe Protection	Catastrophe Amount Recoverable	Comments:
1	04-Dec-12	375,000	200,000	175,000			
2	06-Jun-12	180,000	200,000	-			Falls below retention of Per Person
3	06-Jun-12	250,000	200,000	50,000			
4	06-Jun-12	50,000	200,000	-			Falls below retention of Per Person
5	06-Jun-12	2,280,000	200,000	1,800,000			Capped at maximum recovery amount
6	05-Mar-12	3,500,000	200,000	1,800,000			Capped at maximum recovery amount
Total PPXL Recovery		6,635,000		3,825,000			

examples and flow them through different scenarios.

Table 3 demonstrates the impact of a stand-alone PPXL program which has been exposed to six claims comprising $6,635,000. To keep the example fairly straightforward, the PPXL is a single layer of $1,800,000 in excess of $200,000 per person. The results would be a recovery of $3,825,000 with two claims actually falling below the $200,000 retention and consequently not recoverable.

Table 4 takes those same claims and considers the impact on a CAT program without the benefit of recoveries from the PPXL. Here we are assuming that claims 2 through 5 are from a single incident that occurred on 6-Jun-2012 and therefore meet the criteria for aggregation and also exceed the three life warranty. In this instance the claims are aggregated together and combine to $2,760,000. From this, the retention of $500,000 is taken and the resulting recovery is $2,260,000:

Lastly, Table 5 calculates the impact of this claim set if both PPXL and CAT programs are applied with the PPXL "inuring" to the benefit of the CAT. Inuring means that the PPXL is calculated first and any recoveries are factored in before the CAT calculations are performed. This is to ensure that there are not more in recoveries from reinsurance than there were in actual underlying claims. To demonstrate the need for this, consider the following : Table 3 calculated the recovery on Claimant 3 to be $50,000 and Claimant 5 to be $1,800,000 for a total of $1,850,000. Table 4 showed that the sum of claims for claimants 2 – 5 was $2,760,000 and the recoveries on a CAT basis would be $2,260,000. If there were no inuring of coverage, then the total recoveries would be $1,850,000 for the PPXL and $2,260,000 for the CAT which equals $4,110,000, however the claims incurred for this event were only $2,760,000!

In Table 5, the PPXL calculations are unchanged and result in a recovery of $3,825,000, but because of the "inuring" provision, the CAT program losses are reduced

Table 4: Catastrophe Excess of Loss (XOL) Coverage. $4,500,000 in excess $500,000, with a 3 life warranty

Claimant	Date of Loss	A Amount of Claim	B Less: Reinsurance Retention	C = A - B Per Person Amount Recoverable	D = A - C Amount Subject to Catastrophe Protection	"E = D Total - B Total" Catastrophe Amount Recoverable	Comments:
1	04-Dec-12	375,000					
Total for 04-Dec-12		375,000	500,000	-			Single life event, not recoverable from Cat
2	06-Jun-12	180,000			180,000		All claims for this date (as long as all were involved in the same accident) are added together and this is applied to the limits and retention
3	06-Jun-12	250,000			250,000		
4	06-Jun-12	50,000			50,000		
5	06-Jun-12	2,280,000			2,280,000		
Total for 06-Jun-12		2,760,000	500,000		2,760,000	2,260,000	
6	05-Mar-12	3,500,000					
Total for 05-Mar-12		3,500,000	500,000				Single life event, not recoverable from Cat
Total PPXL Recovery		6,635,000				2,260,000	

from $2,260,000 to $410,000 for a total recovery of $4,235,000 out of the $6,635,000 in total claims.

All this is very interesting, and it lends itself to many hours of mathematical spreadsheet fun, but why would an insurer want to purchase these types of protection and what is the attraction for reinsurers? Clearly disasters can and do have a significant impact on a company's balance sheet, but even single life losses for high dollar policyholders can cause concern. PPXL and CAT reinsurance are tools that are used to protect against these unforeseen events and often the cost is low relative to the risk and volatility. In the last several years there has been a great deal of competition in the A&H reinsurance marketplace, and there has been a reduction in the supply of Life CAT opportunities because of mergers and acquisitions which have led to

higher retentions. Insurers also have the option of purchasing, or increasing, traditional reinsurance coverage to counter these exposures. CAT programs can be loss-free for many years and this leads some companies to cancel their protection, all of which puts downward pressure on pricing—at least until a large insured loss signals a correction in rates. For A&H reinsurers, the business is volatile and not for the faint of heart. The loss ratios in this business are typically either very good (and may remain so for many years) or very, very bad. However, the potential loss-free nature of CAT business makes this an attractive market and has indeed created a dedicated group of "crazy CAT people" willing to enjoy the ride. ∎

Table 5: Per Person AND Catastrophe Excess of Loss (XOL) Coverage. $1,800,000 in excess $200,000 per person, plus $4,500,000 in excess $500,000, with a 3 life warranty

		A	B	C = A - B	D = A - C	"E = D Total - B Total"	
Claimant	Date of Loss	Amount of Claim	Less: Reinsurance Retention	Per Person Amount Recoverable	Amount Subject to Catastrophe Protection	Catastrophe Amount Recoverable	Comments:
1	04-Dec-12	375,000	200,000	175,000			
Total for 04-Dec-12		375,000	500,000	-			Single life event, not recoverable from Cat
2	06-Jun-12	180,000	200,000	-	180,000		Falls below retention of Per Person
3	06-Jun-12	250,000	200,000	50,000	200,000		
4	06-Jun-12	50,000	200,000	-	50,000		Falls below retention of Per Person
5	06-Jun-12	2,280,000	200,000	1,800,000	480,000		First 200k + excess over $2M = $480k
Total for 06-Jun-12		2,760,000	500,000		910,000	410,000	
6	05-Mar-12	3,500,000	200,000	1,800,000			
Total for 05-Mar-12		3,500,000	500,000			-	Single life event, not recoverable from Cat
Total Recovery		6,635,000		3,825,000		410,000	
Total Recovery for Both PPXL and CAT coverage						4,235,000	