A.M. BEST

SPECIAL REPORT APRIL 17, 2007

2007 Special Report: U.S. Tornadoes

"Toto…We're Not in New Jersey Anymore"

Surprisingly, New Jersey tops the list of states with the highest average expected insured losses per 1,000 square miles from tornado and related weather events.

It seems that Dorothy in *The Wizard of Oz* could have just as reasonably said to her little dog: "Toto, I've got a feeling we're not in New Jersey anymore."

Most people associate tornado activity with the "Tornado Alley" of the Great Plains states. While this is true in terms of the sheer numbers of tornadoes and losses, surprisingly, catastrophe modeling[1] shows that New Jersey tops the list of the states with the highest average expected, or modeled insured losses, per 1,000 square miles from tornado and related weather events, followed by Connecticut, Massachusetts, Ohio and Rhode Island (see **Exhibit 1**). Tornadoes have occurred in all 50 states, however, the high average loss rates in the above mentioned five states are affected heavily by insured property values in addition to the frequency of the storms.

While it is true that tornadoes have struck around the world, geographic and weather conditions are most favorable for frequent and severe storms in the United States and Bangladesh. The vast bulk of insured losses, however, are suffered in the United States. Again, this is because of the ubiquity of insurance coverage in the United States and high property values.

As opposed to floods and earthquakes, "wind events, including tornadoes and hurricanes, are considered a basic covered peril in the vast majority of homeowner's insurance policies," Florida Insurance Commissioner Kevin M. McCarty, said in testimony, March 27, to a subcommittee of the House Committee on Financial Services.

Most people associate tornado activity with the "Tornado Alley" of the Great Plains states, however, tornadoes also are common in Florida. This tornado in Tampa Bay, Fla., touched down in St. Petersburg on the afternoon of July 12, 1995, damaging buildings, but with no reported injuries.

AP Photo/St. Petersburg Times, Brian Baer

McCarty was speaking on behalf of the National Association of Insurance Commissioners regarding the need for a national plan for handling natural catastrophe losses. Damage to vehicles caused by wind, hail, tornadoes and flooding is covered if the vehicle is insured with comprehensive coverage, according to Gary Kerney, assistant vice president of ISO's Property Claim Services (ISO/PCS) unit. While vehicle own-

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[1] Damage estimates used were provided by Risk Management Solutions from their catastrophe modeling combining their Tornado/Hail Model and their Industry Exposure Database of July 1, 2006. The model's representation of frequency and severity includes historical reports from 1880 to 1998, with a focus on the period 1990-1998.

ers are most likely to carry liability insurance, PCS believes that only about 50% of vehicles carry collision and comprehensive coverage. Crop insurance covering perils such as hail, fire and lightning is available through private insurers as well as the Federal Crop Insurance Corp.

Exhibit 1
Damaging Tornado/Hail Events by State

Rank	State	Modeled Annual Average Occurrence Rate*	Rank	State	Modeled Annual Average Occurrence Rate per 1,000** Sq Miles	Rank	State	Modeled Average Annual Loss ($Mil) per 1,000** Sq Miles
1	TX	29.83	1	RI	0.914	1	NJ	15.70
2	OK	28.65	2	DE	0.692	2	CT	15.44
3	KS	24.10	3	CT	0.531	3	MA	13.54
4	MO	19.37	4	OK	0.417	4	OH	12.01
5	NE	17.70	5	MD	0.380	5	RI	11.41
6	AR	16.12	6	NJ	0.348	6	MD	9.49
7	IA	12.84	7	MA	0.336	7	IL	8.61
8	MN	12.64	8	AR	0.310	8	OK	7.75
9	CO	11.96	9	KS	0.295	9	DE	7.23
10	SD	11.61	10	MO	0.281	10	IN	6.88
11	IL	10.90	11	NH	0.273	11	MO	6.49
12	LA	10.63	12	VT	0.265	12	MI	5.77
13	NC	10.41	13	IN	0.258	13	GA	5.29
14	MS	10.30	14	SC	0.247	14	PA	5.04
15	TN	9.72	15	LA	0.244	15	TX	4.94
16	ND	9.68	16	TN	0.236	16	NC	4.93
17	OH	9.55	17	OH	0.233	17	TN	3.81
18	IN	9.26	18	WV	0.231	18	NY	3.67
19	AL	9.16	19	NE	0.230	19	FL	3.61
20	GA	8.99	20	IA	0.230	20	MN	3.48
21	KY	8.48	21	MS	0.220	21	SC	3.39
22	MI	8.07	22	NC	0.214	22	KS	3.27
23	WI	7.71	23	KY	0.213	23	KY	3.14
24	SC	7.44	24	IL	0.196	24	AR	2.97
25	VA	6.98	25	AL	0.181	25	WI	2.95
26	MT	6.73	26	VA	0.176	26	IA	2.84
27	PA	6.68	27	MN	0.159	27	CO	2.81
28	NM	6.49	28	GA	0.155	28	VA	2.63
29	FL	5.92	29	SD	0.153	29	LA	2.61
30	NY	5.86	30	PA	0.149	30	AL	2.56
31	WY	5.66	31	WI	0.142	31	MS	1.95
32	WV	5.60	32	ND	0.140	32	NE	1.78
33	MD	3.71	33	MI	0.139	33	NH	1.67
34	ID	2.90	34	NY	0.124	34	WV	1.40
35	MA	2.63	35	CO	0.115	35	VT	0.90
36	NJ	2.58	36	TX	0.114	36	SD	0.40
37	CT	2.57	37	FL	0.110	37	ND	0.38
38	ME	2.50	38	ME	0.081	38	ME	0.33
39	VT	2.45	39	WY	0.058	39	AZ	0.19
40	NH	2.44	40	NM	0.053	40	UT	0.18
41	AZ	2.18	41	MT	0.046	41	NM	0.16
42	UT	1.83	42	ID	0.035	42	CA	0.16
43	OR	1.57	43	UT	0.022	43	WA	0.13
44	DE	1.35	44	WA	0.020	44	WY	0.11
45	WA	1.33	45	AZ	0.019	45	ID	0.10
46	CA	1.15	46	OR	0.016	46	MT	0.07
47	RI	0.95	47	CA	0.007	47	OR	0.03
48	NV	0.73	48	NV	0.007	48	NV	0.03

*Based on a modeled annual occurrence rate of 70.6 events where insured losses are generated. When an individual event impacts more than one state, it is included in the event counts of each of the affected states.
** 1,000 square miles is a circular radius of 17.8 miles.
Sources: RMS, A.M. Best Co.

2006: The Worst Year on Record

Tornado and related weather events were particularly costly in 2006, creating more than $8 billion in insured losses, the worst year on record. The first quarter of 2007 has just concluded with a preliminary estimate of 334 tornadoes, up 65% from the first quarter of 2006 (see **Exhibit 2**). The new year began with a string of deadly tornadoes in the South. In the first three months of 2007, the Insurance Services Office (ISO) identified seven catastrophe

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events, three of which were classified as wind and thunderstorm events. As of the end of March, ISO issued estimates of $560 million in damages for two of the wind and thunderstorm events; no estimate had been issued yet for the events during the last week of March.

Insured losses tied to tornadoes usually are aggregated by storm system, as opposed to damages from an individual tornado, and include losses from related severe weather events such as hail, severe thunderstorms, micro-bursts/straight wind and flooding covered by private insurance. Due to inconsistencies and lack of necessary detail in publicly available tornado-related data, we have used the modeled data from Risk Management Solutions (RMS) for our state-by-state comparisons. Both the indicated average event counts and average annual losses are expected counts and losses, as generated by the RMS catastrophe model.

Tornadoes regularly take a terrible toll in lives and property loss. Insured losses have the potential to reach $10 billion in a 100-year event, or an aggregate annual 100-year loss of $20 billion or more. Nonetheless, tornado-related insured losses have had limited impact on the insurance industry from the standpoint of raising solvency concerns.

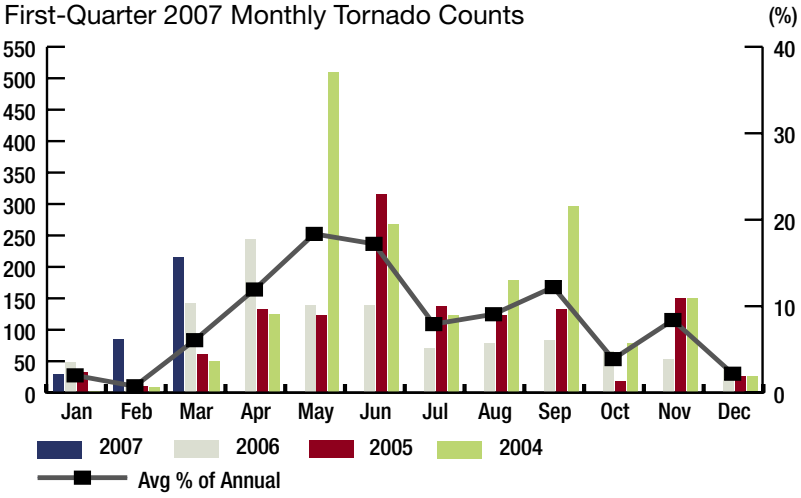
Of the 51 impaired insurers in A.M. Best's P/C impairment study that have been identified as having failed due to catastrophe losses, only three companies had losses triggered by tornadoes and other related severe weather. Each of those impaired companies was a small insurer with a heavy concentration of risk in a limited geographic region. Importantly, all three firms had either no Best's Rating or a Vulnerable ("B" or below) Best's Rating. As far as current ratings are concerned, A.M. Best already considers a company's exposure to tornadoes and other catastrophes in its rating methodology (see Catastrophe Analysis in A.M. Best's Ratings sidebar).

While hurricanes and earthquakes, on average, tend to generate higher losses per event, tornadoes and related weather

Exhibit 2

U.S. Tornado Seasonality 2004 to 2006

First-Quarter 2007 Monthly Tornado Counts



October 2006 to March 2007 counts are preliminary.
Sources: NOAA, A.M. Best Co.

Exhibit 3

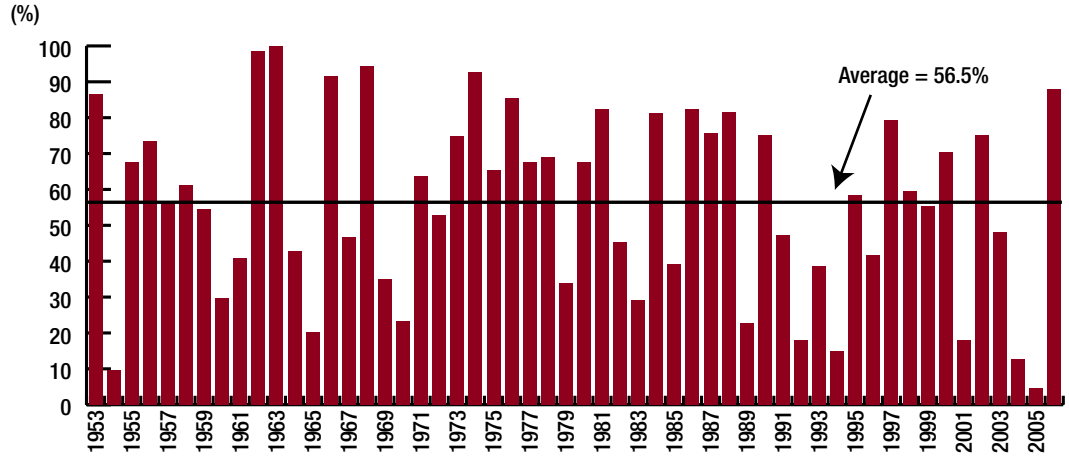
F - Scale or Fujita Tornado Damage Scale*

Scale	Wind Estimate (MPH)	Typical Damage
F0	<73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

*Developed in 1971 by T. Theodore Fujita of the University of Chicago.
Source: NOAA.

Exhibit 4

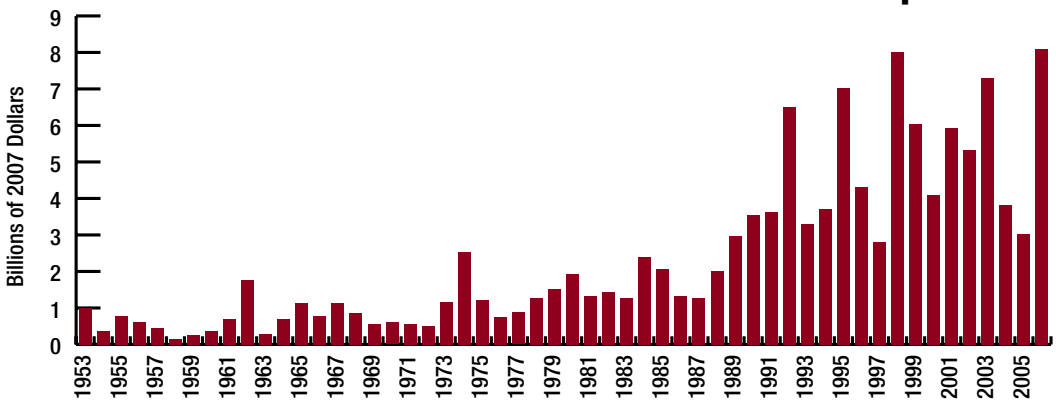
Wind and Thunderstorm Events as Percent of Total Insured Catastrophe Losses



Source: ISO/PCS, A.M. Best Co.

Exhibit 5

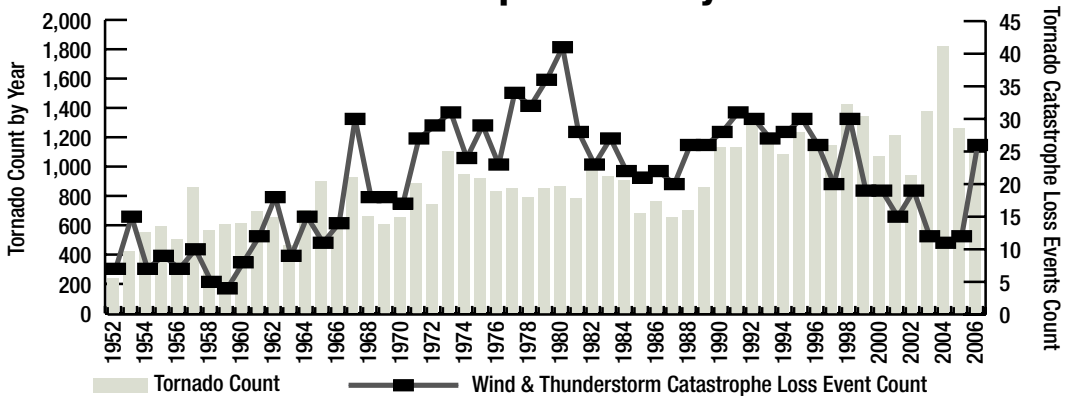
Wind and Thunderstorm Events—Annual Insured Catastrophe Losses



Inflation adjustment based on Construction Cost Index (McGraw-Hill).
Sources: ISO/PCS, A.M. Best Co.

Exhibit 6

Tornadoes and Related Catastrophe Counts by Year



Sources: NOAA, ISO/PCS.

events—large hail, severe thunderstorms, micro-bursts/straight wind and flooding—have caused, on average, about 56% of all insured catastrophe losses in the United States in any given year since 1953 (see **Exhibit 4**). Catastrophic losses are defined by ISO/PCS as those of $25 million or more.

Exhibit 5 shows insured tornado losses by year, restated into today's dollars, with an overall rising trend in losses for the period since 1989. The trend is generally attributable to rising property values, greater building density in tornado-prone areas, more universal insurance coverage and possibly greater tornado frequency.

Exhibit 6, "Tornadoes and Related Catastrophe Counts by Year," shows the number of tornadoes increasing since 1953.[2] Part of the phenomenon is attributable to better tracking and reporting (see Fear and Fascination of Tracking Tornadoes sidebar). Today, there is considerable debate concerning climate change and its influence on catastrophic weather events. In the case of tornadoes, however, we refer to the observation of the Intergovernmental Panel on Climate Change, which states that there is "insufficient evidence to determine whether trends exist (relative to climate change)…in small scale phenomenon such as tornadoes, hail, lightning and dust-storms."[3]

Exhibit 7 shows the 10 costliest U.S.

[2] The tornado catastrophe count has averaged below 20 during the last 10 years, per ISO/PCS. The difference between the count and the "events" shown in the earlier RMS data (70.6 per year), is that the count for ISO/PCS begins only when an event exceeds the catastrophe threshold of $25 million in insured property losses.

[3] "Climate Change 2007: The Physical Science Basis, Summary for Policymakers, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change," February 2007, p. 10.

Sen. John F. Kennedy, Massachusetts, center, with two companions, inspects tornado damage in Shrewsbury, Mass., June 10, 1953. The F4 tornado caused 94 deaths, 1,300 injuries, and destroyed or damaged 4,000 buildings and hundreds of cars in Central Massachusetts, which begins the New England tornado alley.

AP Photo

Exhibit 7

Ten Costliest U.S. Tornadoes

Rank	Date	Location	Billions of 2007 Dollars*
1	Mar 31, 1973	Central-Northern Georgia	5.21
2	Jun 8, 1966	Topeka, Kansas	1.94
3	May 11 1970	Lubbock, Texas	1.43
4	May 3, 1999	Oklahoma City, Oklahoma	1.30
5	Apr 3, 1974	Xenia, Ohio	0.98
6	May 6, 1975	Omaha, Nebraska	0.91
7	Apr 10, 1979	Wichita Fall, Texas	0.73
8	Jun 3, 1980	Grand Island, Nebraska	0.70
9	Oct 3, 1979	Windsor Locks, Connecticut	0.66
10	May 8, 2003	Oklahoma City, Oklahoma	0.44

*Damages are total, not just insured property losses.
Sources: NOAA, A.M. Best Co. using Construction Cost Index deflator.

Tornadoes

In its most basic definition, a tornado is a violently rotating column of air extending from a thunderstorm to the ground, according to the National Oceanic & Atmospheric Administration (NOAA). Tornadoes can reach wind speeds in excess of 300 miles per hour. The average forward speed is 30 mph, but forward speed may vary from nearly stationary to 70 mph. Damage paths can be in excess of one mile wide and 50 miles long. Other dangerous weather associated with tornadoes includes flash floods, lightning, micro-bursts/straight wind that can reach 140 mph and hail the size of grapefruit. The intensity of damage from tornadoes and related weather is measured by the Fujita Damage Scale (see **Exhibit 3**).

Although tornados can occur anytime of year, the tornado "season" is generally defined as from April through September (see **Exhibit 2**). Hence, the deadly tornado activity early in 2007 might have seemed premature, but NOAA meteorologist Dennis Felkin told *BestWire*, that the severe weather over many states in the Southeast in early March was not unusual. "Severe weather season tends to shift from one part of the country to the other as we go from winter to spring," he said, with the states with the greatest risk during January and February being Florida, Mississippi, Alabama, Louisiana and Georgia.

Exhibit 8

Top-35 Writers of U.S. Property Catastrophe[5]

Coverage (ex-Earthquake) - 2005
Companies are group or unaffiliated singles

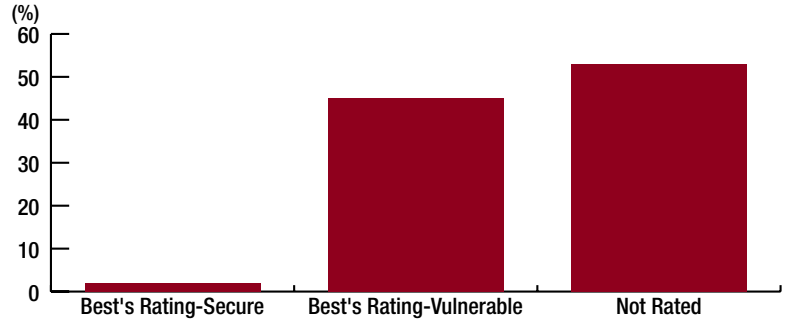
Rank	Company	Direct Premiums Written ($ Billions)	Market Share
1	State Farm Group	26.96	14.38%
2	Allstate Insurance Group	16.11	8.59%
3	Farmers Insurance Group	8.73	4.65%
4	St Paul Travelers Group	8.11	4.33%
5	Nationwide Group	7.45	3.97%
6	USAA Group	5.27	2.81%
7	Liberty Mutual Insurance Companies	5.17	2.76%
8	Progressive Insurance Group	5.16	2.75%
9	American International Group Inc	4.79	2.55%
10	Hartford Insurance Group	4.57	2.44%
11	Berkshire Hathaway Insurance Group	3.94	2.10%
12	Chubb Group of Insurance Companies	3.64	1.94%
13	American Family Insurance Group	3.41	1.82%
14	Zurich Financial Services NA Group	2.99	1.59%
15	Safeco Insurance Companies	2.69	1.43%
16	Allianz of America, Inc	2.67	1.43%
17	Auto-Owners Insurance Group	2.44	1.30%
18	FM Global Group	2.02	1.08%
19	Erie Insurance Group	1.99	1.06%
20	CNA Insurance Companies	1.96	1.05%
21	ACE INA Group	1.86	0.99%
22	MetLife Auto & Home Group	1.72	0.92%
23	Assurant Solutions	1.70	0.91%
24	Citizens Property Insurance Corporation	1.61	0.86%
25	Southern Farm Bureau Group	1.39	0.74%
26	Cincinnati Insurance Companies	1.33	0.71%
27	Mercury General Group	1.28	0.68%
28	California State Auto Group	1.26	0.67%
29	COUNTRY Insurance & Financial Services	1.22	0.65%
30	Hanover Insurance Grp Prop and Cas Cos	1.20	0.64%
31	Auto Club Enterprises Insurance Group	1.18	0.63%
32	Great American P & C Insurance Grp	1.14	0.61%
33	Unitrin Inc	0.97	0.52%
34	White Mountains Insurance Group	0.93	0.50%
35	Auto Club Group	0.92	0.49%
	Total	**139.77**	**74.53%**

Source: *Best's Stateline-Property/Casualty* product.

Exhibit 9

Catastrophe-Triggered Financial Impairments

Best's Ratings in Year of Impairment



Source: A.M. Best Co.

tornadoes, in 2007 dollars. The damage estimates are for total damages, not just the insured property damages that affected insurers. Number five on the list is a tornado at Xenia, Ohio on April 3, 1974. The tornado struck just before 4:30 p.m., destroying most of the town and killing 25 people. The storm was part of the most spectacular and damaging outbreak in the 20th century, according to NOAA. The "super outbreak" of April 3-4, 1974 "lasted 16 hours and produced a total of 148 tornadoes across 11 states from Illinois, Indiana and Michigan southward through the Ohio and Tennessee Valleys into Mississippi, Alabama and Georgia. It produced more long-track tornadoes than any other, killing 315 people and injuring more than 5,000."[4]

Tornado Insured Losses and Insurer Impact

The top 35 writers of U.S. property catastrophe insurance (net of earthquake coverage),[5] according to Best's Stateline-Property/Casualty product, are listed in **Exhibit 8**. These generally are the larger insurers exposed to insured losses resulting from tornadoes and related severe weather.

A.M. Best has found that the common denominator among insurer failures is a diminished operating environment that often is triggered by external factors affecting the industry's underwriting or investment results. Negative underwriting events in the form of catastrophes can stress already vulnerable companies to the breaking point.

As shown in **Exhibit 9**, a company's Best's Rating, or lack of same, was a reasonable predictor of whether an insurer might succumb to the impact of a catastrophe.

As mentioned earlier, of the 51 companies identified as having failed primarily due to catastrophic losses in the 1969 to 2006 period, most either had a Vulnerable Best's Rating or no Best's Rating. Three of the 51 companies have been tied to losses from "severe" weather in the Mid-West (Iowa, Indiana and West Virginia). Generally,

[4] www.noaanews.noaa.gov/stories/s345.htm

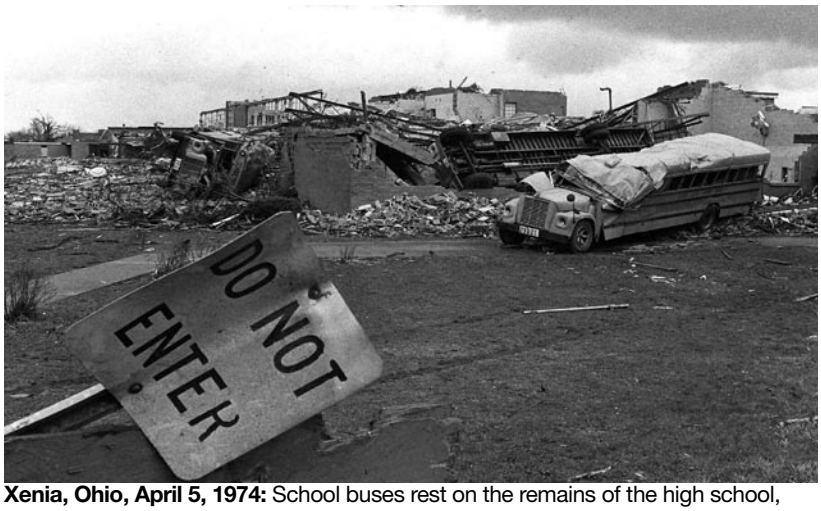
[5] Included lines: Fire, Allied lines, Multiple Peril Crops, Federal Flood, Farmowners Multiple Peril, Homeowners Multiple Peril, Inland Marine, Commercial Multiple Peril (Non-liability Portion), Private Passenger Auto Physical Damage and Commercial Auto Physical Damage.

the companies were smaller insurers with heavily concentrated geographic risk—two were farmer's mutuals with Vulnerable (B and below) Best's ratings. The other insurer was not rated by A.M. Best.

Cat Loss Effects on the Industry

To assess the historical impact of catastrophe losses on the financial strength of the U.S. insurance industry, A.M. Best measured insured losses against industry policyholders' surplus (PHS). PHS essentially is the statutory net worth of the industry—the cushion available to insurers for handling the unexpected losses (see **Exhibit 10**).

A.M. Best found that, in general, the higher the level of insured loss relative to surplus, the greater has been the financial dam-



Xenia, Ohio, April 5, 1974: School buses rest on the remains of the high school, tossed by a tornado that was part of a "super outbreak" through 11 Midwest states. The April outbreak, which lasted 16 hours and produced 148 tornadoes, is considered one of the deadliest and costliest in the 20th century United States.
AP Photo

The Fear and Fascination of Tracking Tornadoes

Probably the first written record of a tornado in the American Colonies was provided by the Rev. Increase Mather, where he described a storm that hit Cambridge, Mass. on July 8, 1680. Matthew Bridge, an eyewitness, "declared that a thick black cloud in continuous circular motion produced a great noise in the process of tearing down trees and picking up bushes, trees and large stones." *

Due to their sudden and violent devastation, tornadoes have created such fear in the public imagination that the U.S. Weather Bureau at various times before 1950 forbade or discouraged forecasters to issue tornado warnings for fear of causing panic.

The first documented successful tornado forecast by meteorologists, however, according to NOAA, was made by the military on March 25, 1948. On that date, two meteorologists, Maj. E.J. Fawbush and Capt. Robert C. Miller, at Tinker Air Force Base, Oklahoma, observed the same weather conditions that had occurred five days earlier when a tornado hit Central Oklahoma and the air force base, causing more than $10 million in destroyed aircraft, alone. As a result of the meteorologists' observations, a tornado warning was issued and the air force base was secured before the second tornado in a week touched down at 6 p.m. causing $6 million in damage, $4 million less than the previous tornado.

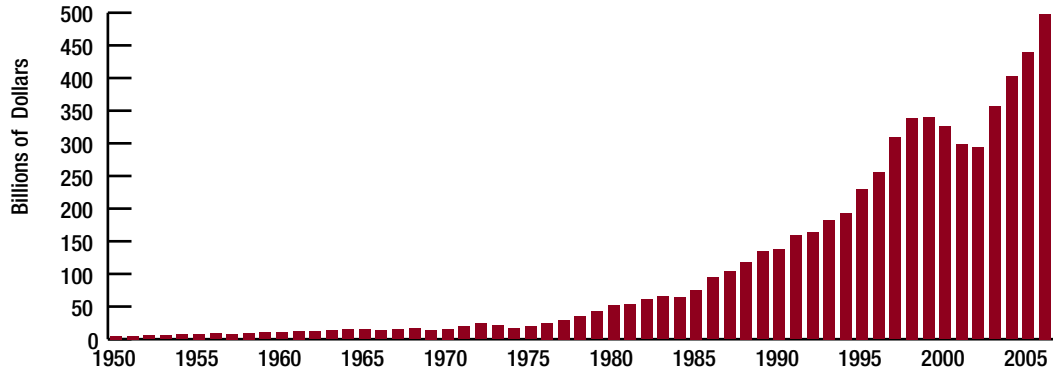
Tornado observation and reporting received a boost again in 1953. That year, Congress briefly debated whether the increase in tornadoes was caused by atomic bomb testing. According to a U.S. Weather Bureau report, "Effects of Atomic Explosions on the Frequency of Tornadoes in the United States," December 1954, 532 tornadoes were reported in the United States in 1953—more than 200 higher than the next highest yearly total of record. More than half of the tornadoes were reported between March 17 and June 15, 1953, the same period when atomic weapons were being tested in Nevada. This, according to the report, apparently led many people to believe that the testing caused an increase in tornadoes. As a result, the weather bureau studied the weather during the atomic testing, but found "no evidence of any effect away from the test site." The weather bureau's conclusion was that "the increased tornado activity could be accounted for by improvements in the tornado reporting system."

Since the 1950s, observation methods have been enhanced further with Doppler radar and other computer-generated data. Much valuable early warning information also has been provided by professional and amateur "storm chasers" and spotters. After the movie "Twister" in the mid-1990s, storm chasing became a great deal more popular, as amateurs now had laptops, the Internet and cell phones at their disposal to gather data and disseminate information. These advancements have saved lives by increasing the average lead time in warning the public of tornadoes.

* As described in Increase Mather's An Essay for the Recording of Illustrious Providences, per Marlene Bradford, "Historical Roots of Modern Tornado Forecasts and Warnings," American Meteorological Society, 14:4, August 1999.

Exhibit 10

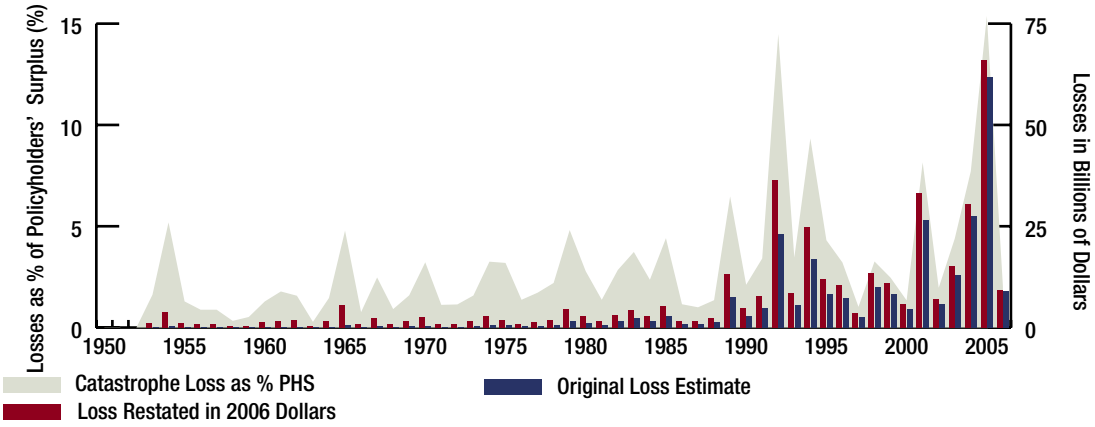
Total P/C Industry Policyholders' Surplus



Note: 2006 is estimated.
Source: A.M. Best Co.

Exhibit 11

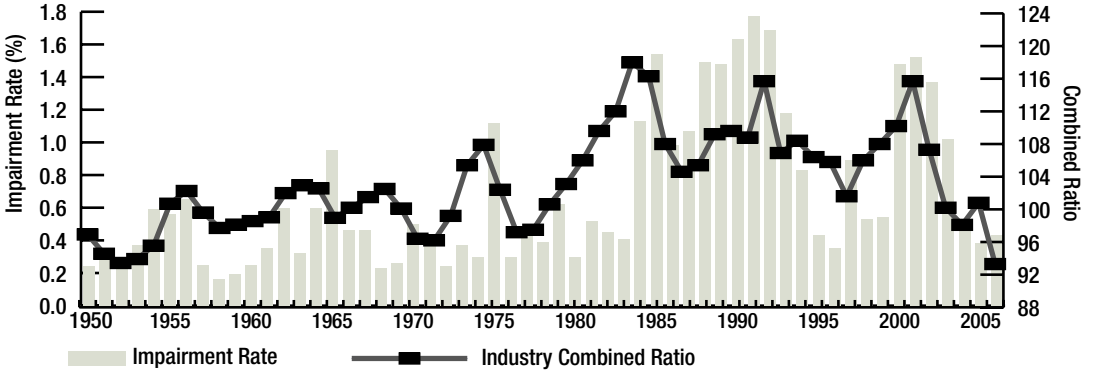
U.S. Insured Catastrophe Losses



Sources: A.M. Best Co., Insurance Information Institute.

Exhibit 12

P/C Industry—Annual Impairment Rate Versus Combined Ratio



2006 Combined Ratio is estimated.
Source: A.M. Best Co.

age to the insurance industry. **Exhibits 11 and 12** show a broad correlation between insured catastrophe losses as a percent of PHS and the P/C industry's annual combined ratios and impairment rates.

A.M. Best believes that the relationship of insured losses to policyholders' surplus is a more realistic measure of catastrophic severity to insurers than the more commonly used method of restating historic losses into current dollars.

Of the last 101 years, 89 have been years in which insured property losses from all catastrophes have been less than 5% of PHS. In the 12 years where losses topped 5% of PHS, insurer financial impairments tended to be higher.

As cited earlier, in an average year, 56% of insured catastrophe losses have been tied to tornadoes and related weather, but those years generally were not the years of 5% of PHS and greater losses. The big loss years usually were tied to hurricanes or earthquakes. There have been only five years—1974, 1975, 1992, 1995 and 2003—where tornado-related insured losses topped 2% of PHS; not a significant stressor of PHS. Only in 1992 did total insured catastrophe losses top 5% of PHS, with losses from tornadoes added onto the insured losses from hurricanes Andrew and Iniki for a total of 14.5% of PHS.

The Modelers

To assess how tornadic events might affect today's insurance industry, A.M. Best asked the leading catastrophe modelers—AIR Worldwide Corp., EQECAT Inc. and Risk Management Solutions—to provide some background material on tornado and related weather risks or possible loss scenarios.[6]

RMS and EQECAT both provided maps of modeled tornado/hail loss for the contiguous 48 states. AIR provided detail on a hypothetical 100-year catastrophe loss event.

As to the loss cost maps, they show modeled annual loss per $1,000 of insurance broken out by ZIP code for RMS and by county for EQECAT.

Both maps show similar patterns with the heaviest loss costs in Tornado Alley, with the most intense concentration in northwestern Texas and the main body of

[6] While AIR, EQECAT and RMS are the more broadly recognized modeling firms, proprietary catastrophe models have been developed by other organizations, such as Applied Research Associates, Inc. and certain academic institutions. Major brokerage firms (e.g., Aon, Benfield, Guy Carpenter and Willis) and some reinsurers also develop catastrophe models in addition to licensing the models of the "Big Three."

Catastrophe Analysis in A.M. Best's Ratings

A.M. Best Co. considers catastrophic loss, both natural and man-made, to be the greatest threat to the financial strength and credit quality of property/casualty insurers due to the significant, rapid and unexpected impact that can occur. While many other exposures can affect solvency, no single event can affect policyholder and debt-holder security more instantaneously than catastrophes. Moreover, immediately following a significant event, the company retains its exposure base, and subsequent events can occur prior to the implementation of any risk-mitigation strategies.

As catastrophic losses continue to rise, insurers and reinsurers are being challenged to further improve their risk management systems and provide capitalization to support the risk.

A.M. Best's response has been to continue to refine its methodology for evaluating insurers' financial strength to reflect the ability to manage catastrophic potential losses. For many years, A.M. Best has been including Probable Maximum Loss (PML) from severe events (1-in-100-year hurricane/windstorm and a 1-in-250 year earthquake) in its calculation of a company's risk-adjusted capitalization as measured by Best's Capital Adequacy Ratio (BCAR). BCAR is an important tool in A.M. Best's evaluation of a company's operating capitalization.

As indicated in A.M. Best's methodology "Catastrophe Analysis in A.M. Best's Ratings," April 2006, A.M. Best performs an additional "stress test" for a second event to determine the potential financial condition of an entity after two successive catastrophes. The stress test for the second event considers the nature of the exposures (hurricane/wind/earthquake) and whether the second event is likely to be more or less severe than the first.

Recent modifications to the stress test also recognize the trend toward increased conservatism of a number of the catastrophe modeling tools now being used by insurers. In addressing the level of capital, the test also gives greater consideration to the financial flexibility of a company—its ability to replenish capital after a catastrophic event—and the greater differential between companies in their employment of strong or weak risk management. The bottom line is that insurers must be able to demonstrate the financial wherewithal to mitigate or absorb the potential losses in order to maintain their ratings.

The full text of the methodology is available at *www.ambest.com.*

Exhibit 13
RMS Modeled Tornado/Hail Loss per $1,000 of Insurance by ZIP Code

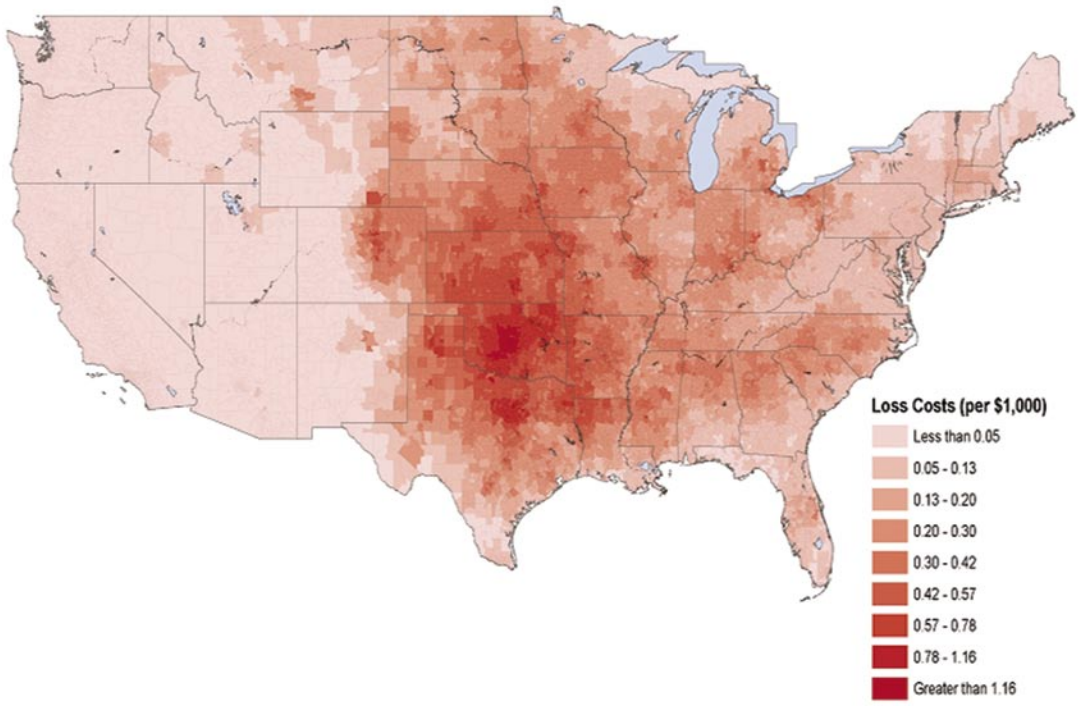
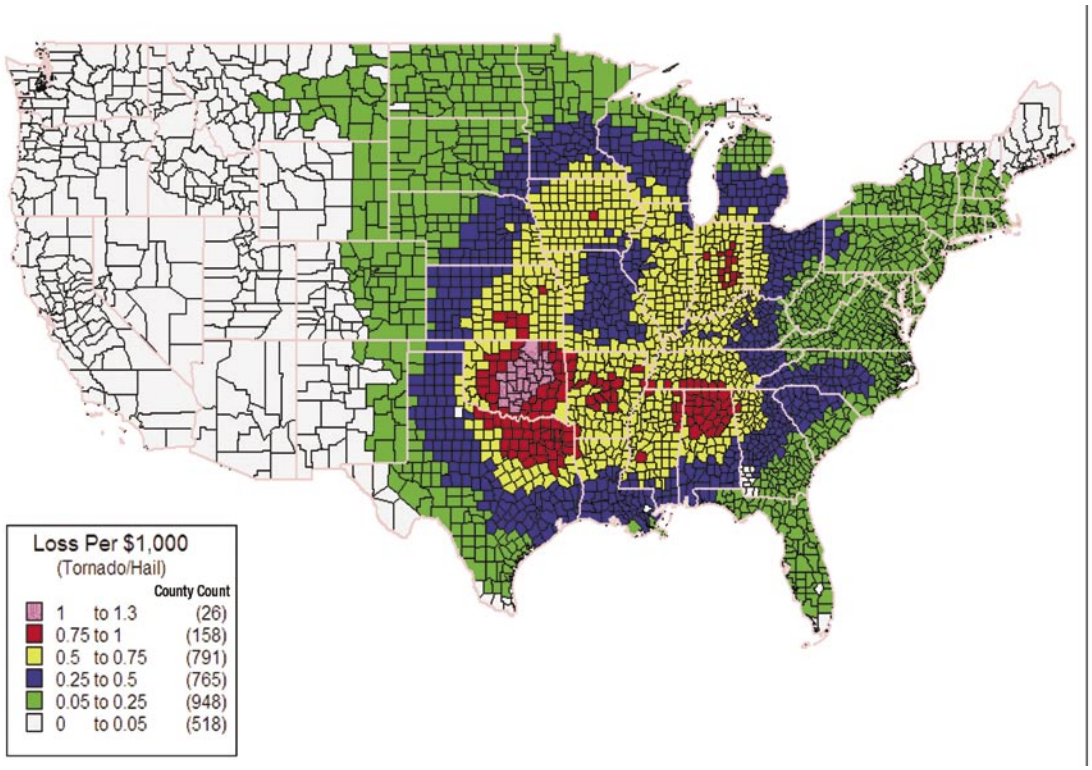


Exhibit 14
EQECAT Modeled Tornado/Hail Loss per $1,000 of Insurance by County



Oklahoma. The earlier rankings of expected annual insured loss per state on a per 1,000 square mile basis are consistent with these maps. Keep in mind that the heavier concentration of economic development and higher insured values in the Northeast helped to shape the state-by-state rankings shown in **Exhibit 1**.

Hypothetical 100-Year Event

AIR explored a hypothetical 100-year catastrophe loss event, with tornadoes, hail and straight wind storms sweeping from the Mississippi Valley into the Northeast. The first map shows (**Exhibit 15a**) the location of the specific tornado, hail or wind events. The second map (**Exhibit 15b**) shows the resulting insured losses by ZIP code for those events, which totaled $11 billion.

In terms of an individual tornado storm system or outbreak, a 100-year event would run in the $10 billion to $12 billion range, per RMS and AIR.

RMS estimated the loss exceedance probability of an annual aggregate insured loss (all annual tornado losses) of $20 billion for the United States at 0.73% or roughly as a 137-year event. AIR estimated the same at about a 100-year event. Such an occurrence would total 4% of year-end 2006 surplus, pushing the threshold of what has historically has caused solvency issues for some insurers, as discussed previously in Cat Loss Effects on the Industry.

One-hundred-year events are significant from a rating standpoint, as they are used in A.M. Best's rating process to stress for potential catastrophic losses. Again, in general, individual tornadic events are more frequent but less costly than hurricanes and earthquakes and, therefore, are easier to underwrite from an actuarial standpoint. While total losses from a tornado are not likely to threaten the full industry, smaller companies that have heavy geographic concentrations can be at risk. As such, all these factors are considered in a Best's Rating.

Acknowledgments

This special report was produced in consultation with Anthony Diadato, vice president of the Property/Casualty Ratings Division of A.M. Best Co.

A.M. Best also greatly appreciates the cooperation and assistant provided by ISO/PCS, AIR Worldwide Corp., EQECAT Inc. and Risk Management Solutions Inc. in the development of this report.

Exhibit 15a

AIR Hypothetical 100-Year Event

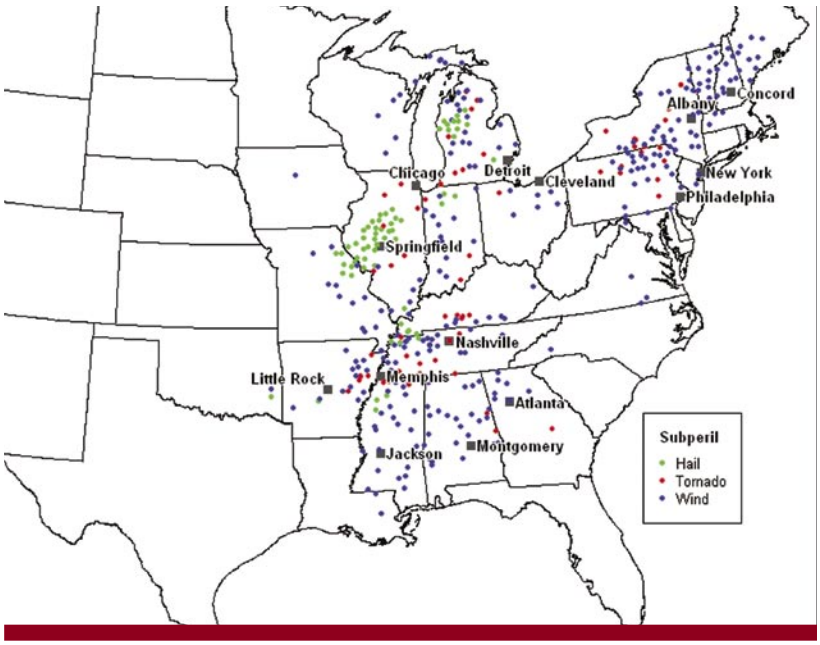
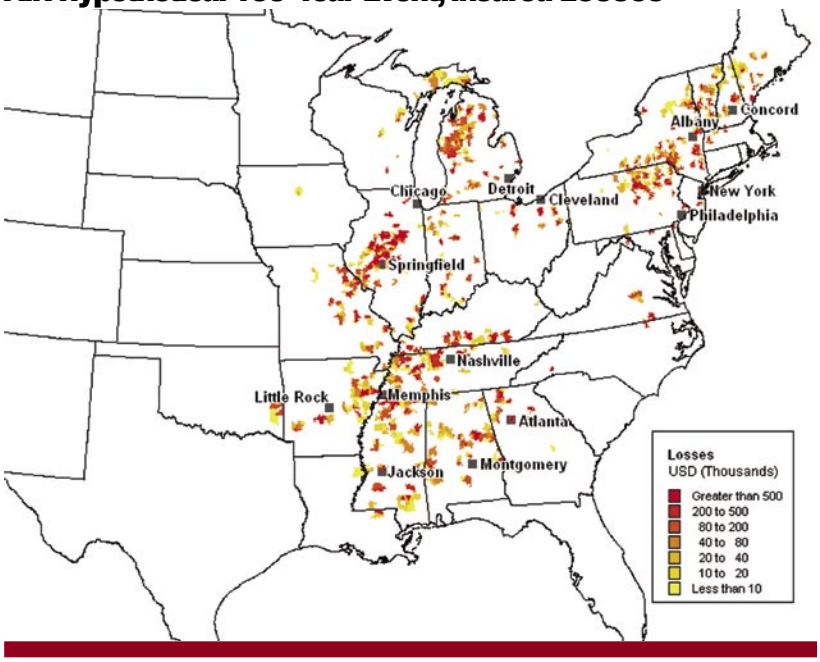


Exhibit 15b

AIR Hypothetical 100-Year Event, Insured Losses



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Financial Strength Ratings

A **Best's Financial Strength Rating (FSR)** is an opinion as to an insurer's financial strength and ability to meet its ongoing obligations to policyholders.

	Rating	Descriptor
Secure	A++, A+	Superior
	A, A-	Excellent
	B++, B+	Good
Vulnerable	B, B-	Fair
	C++, C+	Marginal
	C, C-	Weak
	D	Poor
	E	Under Regulatory Supervision
	F	In Liquidation
	S	Suspended

Rating Modifiers		Affiliation Codes	
"u"	Under Review	"g"	Group
"pd"	Public Data	"p"	Pooled
"s"	Syndicate	"r"	Reinsured

Not Rated Categories (NR)

NR-1	Insufficient Data
NR-2	Insufficient Size and/or Operating Experience
NR-3	Rating Procedure Inapplicable
NR-4	Company Request
NR-5	Not Formally Followed

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