Future FELLOWS

September 2006, Volume 12, No. 3

CAS Accommodates Potential Associates with Extra Course on Professionalism in August 2006

By John Gleba, Chairperson, Committee on Professionalism Education

The June 2006 Courses on Professionalism (COPs) were sold out in early April 2006 causing several candidates to be shut out. For many of the affected candidates, the June COPs in Chicago and Toronto were the last opportunities to attend the course before completion of all other Associateship requirements. In order to accommodate these candidates, the CAS set up an additional COP in August. The additional COP was open only to those candidates who had met all requirements for Associate membership as a result of the spring exams and who would be eligible for Associate membership in fall 2006.

This was only the second time in 16 years that both courses were oversubscribed. In response to the situation this year, the Committee on Professionalism Education will be offering an additional course in June 2007 as well as another course in Asia in either 2007 or 2008 for international candidates. The committee will be discussing other options to address periods of increased registration, including possibly implementing online registration for December 2006 COPs.

The committee reviewed the historical number of CAS candidates who have been eligible to take the COPs at various points in time. Our review indicated that the number of eligible CAS candidates has been relatively constant and there does not appear to be a "spike" in eligible candidates. The committee and the CAS staff do regularly monitor the candidate "pipeline." Just last fall, in response to the recent fast growth in the Asian candidate population and the extreme logistical and economic hardship that coming to the U.S. for the COP imposes on them, the committee took the course to Hong Kong, and plans to do so again on a fairly regular basis, in addition to the regular U.S. courses.

→ turn to page 3

Looking at ERM, Catastrophe Modeling, and Predictive Modeling in Actuarial Career Development

By Benjamin W. Clark, FCAS, Candidate Liaison Committee

Have you been wondering what new developments are happening in the actuarial profession? Have you been to CAS meetings or read CAS publications that discussed new topics with which you have little to no experience?

Three recent advancements in insurance industry analytics have led to hotly desired skill sets and are frequent topics at CAS meetings and in CAS publications. New developments in Enterprise Risk Management (ERM), catastrophe modeling, and predictive modeling are requiring all new skill sets that actuaries would historically be equipped to handle. According to Sally Ezra of D.W. Simpson, 20 to 30 percent of current actuarial positions touch on some aspect of these developments, and this could easily grow to well above 50 percent in the near future. So, what exactly are these developments?

ERM has been around for several decades in the banking industry but has many qualities that make it very applicable to the insurance industry. It provides a complete review of company risk thus enabling management of that risk while trying to optimize capital. As John Tedeschi from

→ turn to page 4

Dates to Remember

Fall Exam Registration Deadlines

There is only one deadline for each set of exams. Late registrations will not be accepted.

September 15, 2006
Exam 1/P

September 21, 2006
Exams 3, 6, and 9

September 24, 2006
Exams 2/FM and 4/C

Winter Exam Registration Deadline

December 21, 2006
Exam 1/P

Refund Deadlines

Exam 1/P
Noon of the second business day before test appointment

All Other Exams
Three weeks (21 days) after exam date

CAS Seminars and Meetings

Casualty Loss Reserve Seminar
September 11-12, 2006
Renaissance Waverly Hotel
Atlanta, Georgia

Limited Attendance Reinsurance Seminar on Catastrophe
September 18, 2006
Hotel—TBA
New York, New York

Special Interest Seminar on Predictive Modeling
October 4-5, 2006
The Westin Copley Place
Boston, Massachusetts

Continued on Page 5

Catastrophe Modeling—An Overview

By David A. Lalonde, FCAS, FCIA

The relative infrequency of catastrophe events and the resulting scarcity of historical loss data make it virtually impossible to reliably estimate potential future catastrophe losses using standard actuarial techniques. Furthermore, the usefulness of the loss data that do exist is limited because of the ever-changing landscape of insured properties. The limitations of the historical data, therefore, make them unsuitable for directly estimating future catastrophe losses.

Catastrophe models represent a significant improvement over traditional methods of risk estimation. They employ alternative methodologies based on sophisticated stochastic simulation techniques that are designed to produce a complete range of potential annual aggregate and occurrence loss experience. The use of models helps insurers quantify their exposure to risk from potential catastrophes, and, in doing so, provide a level of stability to their pricing, while enhancing their overall corporate risk management strategies.

Catastrophe models can be used to address a number of questions, including the location, size, and frequency of potential future catastrophe events. By combining mathematical representations of the natural occurrence patterns and characteristics of hurricanes, tornadoes, earthquakes, severe winter storms, and other catastrophes, with information on property values, construction types, and occupancy classes, these simulation models provide information to companies concerning the potential for large losses before they occur. The purpose of catastrophe modeling is to anticipate the likelihood and severity of potential future catastrophe events so that companies can appropriately prepare for their financial impact.

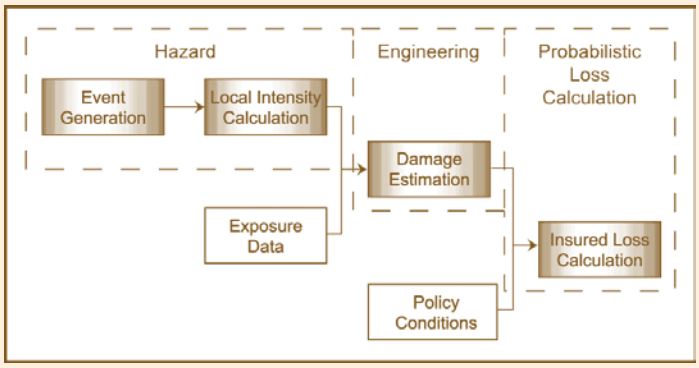
In addition to estimating potential future property damage and losses, models can be used to estimate the number of claims, and the number of injuries and fatalities resulting from a single event, on an annual aggregate basis, or from a series of years.

Catastrophe models are complex computer programs that give mathematical representation to the physical phenomena of catastrophe events.

What is a Catastrophe Model?

Catastrophe models are complex computer programs that give mathematical representation to the physical phenomena of catastrophe events. Key among the modeled variables are annual frequency (allowing for the effective management of multiple-event seasons), location, and severity. Large catalogs of simulated events are generated, which are then overlaid on client exposure data. The intensity of an event, which may be expressed in terms of wind speed, ground shaking, or the impact energy of hailstones, is estimated at each affected location and the effects of that intensity on the built environment is calculated.

These simulations provide a rich variety of output that can be used by insurers for many different applications. Probability distributions of losses are estimated for potential levels of annual aggregate and occurrence losses that an insurer may experience given their portfolio of property exposures. Catastrophe models are very flexible in that the information may be customized to any desired degree of geographical resolution down to location, or site, level, by line of business and, within line of business, by construction class, coverage, etc, for each simulated event. The results of a catastrophe risk assessment also provide the necessary detail to determine which perils, regions, lines of business, and policy forms drive insurers' large loss potential.



Catastrophe model components (shaded)

Components of a Catastrophe Model

Catastrophe models typically utilize the framework illustrated above.

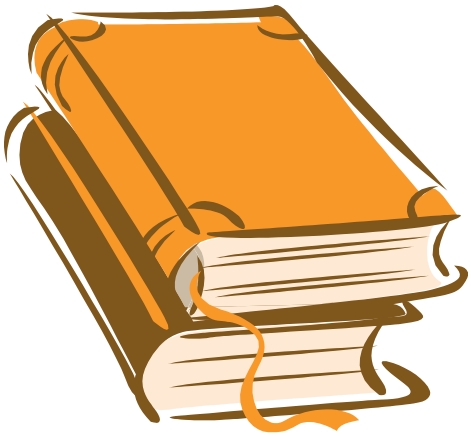
- The hazard component answers the questions: Where are future events likely to occur? How large, or severe, are they likely to be? How frequently are they likely to occur? The model then analyzes the local intensity of the event at each affected site. For example, seismic waves traveling at large distances from the initial rupture can be suddenly and significantly amplified when they hit soft soils. So detailed soil databases are an important ingredient in earthquake models.

- The engineering component of the model superimposes the intensity parameters onto a database of exposed properties. The model then employs mathematical functions called "damageability relationships" that describe the interaction between buildings—including their structural and non-structural components, as well as their contents—and the local intensity to which they are exposed. Estimates of physical damage are translated into estimates of monetary damage.

- Insured losses are calculated by applying the specific policy conditions to the total damage estimates. Policy conditions may include deductibles by coverage,

Extra Course on Professionalism

From cover



Attendance at each COP is limited to a maximum 60 candidates to preserve the course integrity and to provide for a manageable group size to facilitate lively and relevant discussions. Over the last couple of years, the committee has worked very hard to upgrade and reinvigorate the general sessions. This is especially important now that the COP is the only place in the syllabus for candidates to learn about a half-dozen key Actuarial Standards of Practice (ASOPs) that once were part of the examination syllabus. The ability to engage the candidates in an interactive way in these general sessions has been repeatedly noted as key to the sessions' success. Expanding the COP to more than 60 candidates per session would erode any benefits obtained from this interactive structure. Additionally, increasing the number of candidates per site is often not feasible simply due to space and cost limitations associated with the various COP locations. Candidates need to realize that these registration rules are not applied arbitrarily.

In order to ensure that a candidate does not get closed out of attending a COP in sufficient time to obtain their Associate membership, the committee recommends the following:

1. Candidates should register for the course as soon as they are eligible, regardless of the location. Candidates also need to remember that popular locations, such as Las Vegas and Chicago, sell out quickly. Candidates need to be flexible enough to travel to other locations, even if they are unpopular. In the event that a candidate's employer will only support attendance at a local COP, candidates may need to balance the potential personal cost of attending a COP sooner with the rewards of obtaining an ACAS designation on a timely basis.

2. Employers should be flexible enough to allow the employees to attend the COP as soon as they are eligible, rather than asking them to wait up to a year for the COP to come to a convenient location.

The COP has become a core ingredient of the professional education of both CAS candidates and members. We need to recognize its success, and the value of the efforts that make it a success, and constructively search for ways to expand as a result of a growing demand for its services.

Syllabus Highlight

CAS Course on Professionalism

The CAS Course on Professionalism is designed to present candidates with real situations that contain ethical and professional issues for the actuary. Volunteer members of the CAS facilitate small group discussions of actual case studies. Although grades are not given for the Course on Professionalism, candidates must actively participate in order to receive credit. Successful completion of this course is required before a candidate can become a member of the Casualty Actuarial Society. Candidates are urged to register for this course when they have passed five or more CAS Examinations. A candidate must have passed five Associateship examinations and have credit for all three VEE requirements to be eligible to take the Course on Professionalism. (Transitional VEE exams are not included in the count of exams for eligibility to take the course.)

Dates for the CAS Course on Professionalism will be posted in the "Admissions/Exams" section of the CAS Web Site (www.casact.org). Registered candidates will receive a study book of required readings before the start of the course. Each course is limited to 60 participants; early registration is recommended. Facility information and course times will be provided upon registration.

site-specific or blanket deductibles, coverage limits and sublimits, coinsurance, attachment points and limits for single or multiple location policies, and risk or policy specific reinsurance terms. Explicit modeling of uncertainty in both intensity and damage calculations enables a detailed probabilistic calculation of the effects of policy conditions.

How Insurers Use Models

The primary purpose of catastrophe modeling is to give insurers as accurate a picture as possible of the catastrophe loss potential derived from their book of business and to give them the tools they need to consider alternative strategies for managing that risk. Model output may be used to perform sensitivity tests, develop underwriting guidelines, analyze policy conditions, make sound decisions regarding the purchase of reinsurance, estimate consistent loss costs for catastrophe-prone areas, and for overall catastrophe risk management. Other important applications include exposure management, the development of mitigation strategies, portfolio optimization, and reserving and ratemaking.

Models are Not Created Equal

Catastrophe modeling technology is not static and the models themselves continue to evolve in terms of detail, realism, and accuracy. Today, all catastrophe models are not equal. Significant distinctions exist that should be recognized and evaluated by the users.

Catastrophe modeling offers enormous value—value that continues to increase as the technology continues to evolve. Catastrophe modeling enables proactive decision-making and strategic planning and is an essential component to any company's efforts to manage enterprisewide risk.

David Lalonde is senior vice president at AIR Worldwide Corporation, Burlington, Ontario.

Actuarial Career Development

From cover

Guy Carpenter reports, ERM is an enhancement on Dynamic Financial Analysis (DFA). Where DFA was a bottom-up approach instigated by the actuaries, ERM has become a top-down approach pushed by the executives of insurance companies. Because of this top-down push, it is important for actuaries to understand the needs and requirements of the executives and apply these requirements to standard and non-standard actuarial techniques. Many solvency regulators are introducing monitoring measurements that involve ERM. There are also two CAS exams that provide introductory and detailed education on ERM (Exams 6 and 8 respectively). The March 2006 issue of *Future Fellows* contains references and additional details on this topic.

In catastrophe modeling, there is a handful of industry models that have been developed and in use since the late 1980s. But, with the recent increase of frequency and severity of catastrophes, understanding and adapting the catastrophe models has become an even bigger and more critical challenge. Catastrophe models can only take information so far. Being able to interpret the results and introduce these into insurance practices is still a highly desired skill. Companies need analytical people to manage their portfolio to ensure that there is adequate capital to meet company risks as well as to suggest ways to spread these risks across the entire portfolio. Lastly, it is very important to understand the assumptions of the catastrophe models and introduce adjustments as necessary. For example, the expected cost of a Katrina-like hurricane or the likelihood of three hurricanes in one year to hit one state may have been understated by these traditional models. [See David Lalonde's article on catastrophe modeling on page 2.]

Predictive modeling is not a new topic either. It is a process that has its origins in the 1960s with the Bailey's Minimum Bias technique (mentioned in material on CAS Exams 5 and 9). With the development of computing speed and power, actuaries are implementing predictive modeling through Generalize Linear Models across the industry. Personal Lines carriers have been using predictive modeling for some time in setting rates, but it is being carried over to many different lines of insurance as well. With the movement of predictive modeling into other lines, it is very important to not only be able to apply the models, but to be able to communicate with company management on how best to implement the strategies. It is also important to be able to communicate with rate regulators on how the models were used, the credibility of the output, and where judgment is used. (Please see the June 2006 issue of *Future Fellows* for additional detail on predictive modeling.)

What does it take to develop these skills? How do you become highly demanded? First, these skills can really only be developed through real-life practice. There are seminar courses and reading materials that can give you a base for these skills. Casualty actuarial exams are also providing basic knowledge of these topics. These training formats, however, are only a starting point. It is recommended that you work somewhere with these techniques already established before you try to introduce a new procedure to a company setting. There are many consulting firms that have been providing these services for several years. There are also many insurance companies that have long-standing practices. It is best to get started on the ground floor and develop your skill set from there.

Once you have worked on these skills for a few years, you need to develop a good understanding of how to communicate these complex topics to non-technical people. One of the most sought after skills of all types of actuaries is the ability to communicate to non-actuaries. It isn't merely being able to hold a casual conversation with someone, but the ability to take these high-level techniques down to a summarized and simple format so that individuals can make appropriate decisions based on your analyses. With the advent of faster computing power, the large corporate research department is a thing of the past. Most analytics are now being taken to the desktops of individuals within the business units. So, a balance of analytical knowledge with communication skills is needed. It is also important that you become comfortable talking in front of a large group of people. Who knows when the CAS may ask you to make a presentation on new developing trends.

Taking actuarial exams or going through other educational tracks will show insurance carriers your desire to continually improve your insurance knowledge. According to Sally Ezra, many insurance companies would prefer to hire actuaries that have experience in one of the three areas discussed here. Instead, they have had to turn to other professionals without an insurance or actuarial background. This is driven partly by a high demand for actuaries with a limited supply pool, but also partly by the existence of only a small pool of actuaries that have these abilities. Even by hiring non-actuaries, companies still require those who work in these areas to have a strong knowledge of how to put the analytics into insurance practice. Many insurance companies and consulting firms are asking these hired PhDs, engineers, and IT professionals to take actuarial exams.

So, once you develop the analytical knowledge and are comfortable communicating, what's next? Beyond just advancing within the actuarial department, there are many other career paths available. Risk management departments are ever growing within insurance. There are many consulting firms that provide services around risk modeling, portfolio management/optimization, and rate development. There is an ever-increasing number of chief financial officers and chief risk officers that have actuarial backgrounds. With their analytical knowledge, many actuaries have also found it rewarding to provide their services to the banking and financial industries. It just takes one actuary to plow a new direction for all of us.

Ben Clark is a lead actuary at Swiss Re in Overland Park, Kansas.

Announcements for 2007 Posted Online

Syllabus Changes

Changes to the syllabus of readings for 2007 were posted in the "Admissions/Exams" section of the CAS Web Site last month. The changes include the addition of financial economics to Exams 2/FM, 3, and 4/C. The 2007 *Syllabus of Basic Education* will be posted on the CAS Web Site in early November. The 2007 Study Kits will be available for sale on December 1, 2006.

Examination Dates

The exam dates for 2007 have been posted in the "Admissions/Exams" section of the CAS Web Site under "Latest Admissions News."

Resources & Reminders

In the redesigned "Admissions/Exams" section of the CAS Web Site are:

- All updates to the *Syllabus of Basic Education*
- "Notice of Examinations"
- "Verify Candidate Exam Status" to verify that joint exams and VEE credits are properly recorded
- CAS Regional Affiliates have their own section on the CAS Web Site

If you have not received a confirmation of your registration for Exams 3, 5-9 two weeks prior to the registration deadline, please contact the CAS Office.

Remember your Candidate Number!

January 2007 ASNA/ANÉA Convention to Meet in Toronto

"Defying Actuarial Assumptions" is the theme of the annual convention of the Actuarial Students' National Association/l'Association Nationale des Étudiants en Actuariat. The convention will be held at Marriott Eaton Centre in the heart of downtown Toronto, Ontario, January 5-7, 2007.

This annual event is organized, in rotation, by one of the universities represented within ASNA/ANÉA. The University of Waterloo is organizing the 2007 gathering that provides students the opportunity to interact with actuaries and actuarial employers to discuss actuarial science and the profession. It is also an opportunity for actuarial students to meet one another during social activities.

For additional information, contact the University of Waterloo's ASNA/ANÉA 2007 Convention Committee at asna2007@gmail.com.

Dates to Remember

More Events

Limited Attendance Seminar on Reserve Variability
October 24-25, 2006
The Westin O'Hare
Chicago, Illinois

Limited Attendance Reinsurance Seminar on Risk Transfer
November 6, 2006
The Westin New York at Times Square
New York, New York

CAS Annual Meeting
November 12–15, 2006
Hyatt Regency San Francisco
San Francisco, California

Candidate Liaison Committee Mission

The Candidate Liaison Committee communicates with CAS candidates, collectively and individually, who are taking CAS examinations. The committee informs candidates as to appropriate courses of action available to them. Through periodic communication, this committee informs candidates of results of examination administrations, actions taken on complaints received regarding examination questions, and reasons for syllabus and examination changes being implemented. Communication encompasses existing policies and procedures as well as changes being considered. The committee should advise the CAS and its committees of the interests of the candidates regarding matters that come before the CAS and its committees. Candidates may contact the Candidate Liaison Committee at the CAS Office address.

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Results of Spring 2006 CAS Examinations

Summary of Spring 2006 Examinations

Exam	Number of Candidates	Number of Passing Candidates	Number Below 50% of Pass Mark (Ineffective)	Effective Pass Ratio
1/P	3051	1064	459	41.0%
2/FM	4824	2185	370	49.1%
3	375	133	72	43.9%
4/C	2119	1128	103	56.0%
5	708	286	74	45.1%
7-Canada	74	32	2	44.4%
7-US	449	208	19	48.4%
8	377	177	26	50.4%

Summary of Spring 2006 Examination Survey

Exam	Percent Responding	Syllabus Coverage *Inadequate (1) to Adequate (5)*	Exam Clarity *Not Clear (1) to Very Clear (5)*	Exam Length *Too Short (1) to Too Long (5)*	Exam Difficulty *Easy (1) to Difficult (5)*	Exam Quality *Poor (1) to Excellent (5)*
2/FM	1.58%	3.97	3.75	2.96	3.39	3.69
3	51.07%	3.66	3.08	3.49	4.03	3.19
4/C	5.76%	3.50	3.20	3.46	4.02	3.24
5	36.72%	3.96	3.50	4.47	3.58	3.28
7-Canada	41.89%	3.68	3.52	3.68	3.55	3.39
7-U.S.	35.56%	3.54	3.26	3.53	3.46	3.40
8	36.60%	3.62	2.98	3.90	3.46	3.17

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