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### **Session 6PD**

### **Adding Enterprise Risk Management to the Actuarial Career**

**Track:** Actuary of the Future

**Moderator:** James C. Brooks Jr.

**Panelists:** Lloyd A. Foster  
Margaret Resce Milkint†  
Sanjay Srivastava‡

*Summary: The panel presents the evolution of enterprise risk management within the actuarial profession from the perspectives of an actuarial educator, an actuarial recruiter and a corporate risk officer. They discuss how the growing focus on enterprise risk management impacts student education, employer needs and actuarial careers.*

**MR. JAMES C. BROOKS JR.:** In this session we hope to whet your appetite about actuaries involved in enterprise risk management and give you a better idea what that means, what the opportunities are and how we can get prepared to capture those opportunities.

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† Margaret Resce Milkint, not a member of the sponsoring organizations, is a partner at The Jacobson Group in Chicago, IL.

‡ Dr. Sanjay Srivastava is chair of the Department of Risk Management and Insurance at Georgia State University, Atlanta, GA.

We have three outstanding panelists. I'm going to introduce them one at a time before their individual presentations. We'll leave time for discussions and Q&A at the end so you can direct questions or comments to the panelists.

We're going to approach the topic in three segments. First will be from the academic or education perspective. Second, we're going to hear from a practitioner in enterprise risk management who's been involved in this area for a long time. Finally, we'll hear from an executive recruiting perspective with a survey of the current marketplace: what are the barriers for us as actuaries, what are the opportunities and what are the things we need to do better to capture those opportunities.

Our first panelist is Dr. Sanjay Srivastava, who will address the academic perspective. He is currently chair of the Department of Risk Management and Insurance at Georgia State University in Atlanta, Georgia. He's a nationally recognized expert on mathematical and financial risk management. Prior to coming to Georgia State earlier this year, he was Carnegie Mellon University's Alumni Professor of Economics and Finance in the Graduate School of Industrial Administration. Dr. Srivastava is widely published in the *Journal of Risk* and numerous economics journals. He recently served as advisor to such firms as Morgan Stanley, Dean Witter and J. P. Morgan. He has his degree in economics from Warwick University and his Ph.D. in economics from the Massachusetts Institute of Technology.

**DR. SANJAY SRIVASTAVA:** Georgia State has had a long and distinguished actuarial science program. So when we think about adding enterprise risk to the actuarial curriculum, we think really long and hard about it because it's a long program. We have many, many alumni and hopefully many future alumni. And when we think about adding enterprise risk education to the actuarial program we think about it in three ways. The first is how does it contribute to general actuarial education? It makes our program more competitive. The second way is in terms of executive education, continuing education and so on. We've had a long series of professional education seminars in actuarial science. And the third way, which from our point of view is probably the most critical one, is how do we use it as a

competitive tool in terms of it being a competitive advantage or disadvantage to the university's program? There's a large market for people with quantitative skills, and so for us it's really a question of our competitive position in the market for actuarial education. The presentation I'm going to give you is from that perspective.

I want to start by telling you about some elements of what we think of as enterprise risk education. We've thought a long time about this, both for financial and for nonfinancial corporations. Then I'll give an assessment of what we can actually teach within an academic curriculum. Any time you make a decision to add something to a curriculum, you have to be careful that you understand what you cannot do effectively. Then I'll tell you about how we're approaching the problem.

We think of an enterprise as aggregating risks of various types into some variable of interest at the end. The end product would be something you're interested in, like the risk profile of cash flows or earnings, which ultimately transfer into share prices or whatever the variable of interest might be. An enterprise such as a corporation or industry or even a division within a firm aggregates various risks into risk properties of these cash flows. You can describe these broadly as market risk, operational risk and so forth, and these can be further subdivided.

There are various risks: for example, worker's compensation. It could be exchange rate; it could be interest rate risk; it could be whatever risks are out there. When a firm makes a decision to produce something or to market something, it aggregates these risks into its production or operational process. I'm an economist by training, so I think of it as production of some service. Ultimately it feeds through into cash flows and earnings. The essence of enterprise risk from our point of view is to understand what these risks are, and then to have some feel for what happens during the production or operational process, which I think of as an aggregator. It aggregates all these risks and produces cash flows or earnings. Ultimately this is what most management is interested in.

Based on this process, what can we do? The first part is easy. Most academic risk programs and quantitative risk programs, whether in actuarial science or financial engineering, teach the modeling of specific risk. There's a lot of attention paid to

what each risk looks like. What are its properties, and how do we model it? The fields just differ on the types of risk that they focus on. The financial field or risk management field focuses much more on financial risk and strategies for managing those specific risks, including the design of financial contracts, derivatives and so on, but there's very little emphasis on the aggregation of risk.

You essentially study these properties, and that's what we teach. Many programs stop right there. The less quantitative programs such as M.B.A. programs and master's programs spend much less attention on the precise modeling of these risks. They usually have a simplified view of that, but spend more time on how the risks feed through the operation. The other programs are glossing over this and focusing much more on the outcome. The problem with this field is that all of it is difficult. The modeling of the risk is pretty hard. Even something simple like a static balance sheet is not that easy either, and so you have to make a choice. There's a lot of pressure to keep academic programs as short as possible; everybody wants a master's degree in six months. You can't actually do all of this successfully, so it's important as an academic program to focus on what we can do effectively and what we cannot do.

The difficulty is that there are essentially three levels of complexity. The modeling of specific risks can be challenging. For any of you who have been through a mathematical finance curriculum, you'll understand that this in itself is a fairly deep exercise. Understanding the consequences is also hard, as is modeling the interdependencies. The first, as I said before, we can teach very effectively. It's closely tied to academic research, including the risk inherent in the modeling such as model risk and so on. Different ways of modeling the risk will give you different answers. We can illustrate understanding the consequences. However, this is almost impossible for academia to actually do because the ways these risks get aggregated is very industry specific, it's very firm specific and it depends on exactly how operations are laid out. There's almost no way you can teach this in a comprehensive way. I think that's one reason most academic programs focus on the first. There just isn't a generic model that you can apply to the second.

Modeling the interdependencies is the hardest. The third is how can you use risk management to come up with some kind of a strategic decision-making plan or use it in strategic decision making? What are these interdependencies? A firm undertakes various activities, and given the scale of the production and so on, there's some summary information, maybe a balance sheet, maybe a cash-flow statement, that gives you some idea of the risks that the firm is facing. As these risks take on different values or change in some random way, that has a direct effect on the balance sheet and, therefore, on whatever variables you're interested in.

The problem is that the nature of that dependence itself can depend on the risks. The first part would show up in normal financial statements. For example, there's a firm that's exporting a product to Japan. The current sales are one million units, and when the exchange rate is figured in, the expected cash flow is a \$1 million. So, on the balance sheet, exports from Japan are \$1 million. Then you can say that if the exchange rate changes, the revenue will change. If the Japanese yen appreciates or depreciates, the firm will get either more or fewer dollars per yen from that one million units of sales.

The problem is that the sales will not be fixed at one million if the exchange rate changes because the one million units is not a static quantity. It's a dynamic quantity. It not only depends on the yen, but may depend on what the British pound does or what interest rates do as well. That's something that's firm specific, because we don't know for a specific good or service what that dependency on the risk factor actually is. That can be illustrated in a curriculum pretty much at this level, but the actual modeling is going to be something that has to be done in the business. It has to be done on the job.

In a more extreme example, a risk doesn't even show up on the balance sheet. A Midwest bicycle manufacturer in the 1980s did all of their production domestically. It was based in the Ohio area, and they bought their rubber from Akron and steel from Pittsburgh and so on, and they sold bicycles in the local market. If you looked at their balance sheet, there was no exchange rate exposure. However, around 1984 or 1985, the U.S. dollar appreciated very significantly, and a French bicycle

company entered the market and basically wiped out this small bicycle company. This is an extreme example of the interdependence of cash flows on risk, and there's no way for us to model this kind of complexity in a generic way. We can illustrate it, but we can't do much beyond that.

There are long traditions of modeling the specific risks. We know how to do that in fairly reasonable ways. The next stage of it, I think, is much, much harder. The approach we are taking is first to make sure that people have strong quantitative modeling skills. This is really important because the people who will be competing for these jobs will be competing with people who are very well trained from other types of programs, whether they're in mathematical, finance or statistics. We need to make sure that there are strong quantitative modeling skills so that people who come out of our actuarial enterprise risk program can compete with anybody across the board. Obviously we like to emphasize weaknesses of specific approaches, because it's very easy to get caught up in the technique and lose sight of the bigger picture. We would also like to provide exposure to ways of thinking about enterprise risk, including these interdependencies and complexities that I just described.

What we did, which will start next fall, was to create a dual degree in actuarial science and mathematical risk management. In our typical actuarial science program, students would come for about three semesters, typically 18 months, and take a traditional actuarial science curriculum together with some basic foundational courses. We have now divided the degree into two parts. You can combine the actuarial science degree with a mathematical risk management degree.

The mathematical risk management degree is much wider than just actuarial science. It's also wider than simply mathematical finance or financial engineering. We have split it up into three parts: traditional actuarial science, 30 percent, which is focused on exams. We want to keep the exam focus because the students are also managing their risk, and they want to make sure that at the very least they can go back to a traditional actuarial job. Another 30 percent comprises traditional financial, economic and mathematical modeling of risk. Then we developed about 30 percent of the curriculum to try and get at these interdependencies, these

complexities that are inherent. Those are essentially all case studies, and they come either from people working in the industry who provide problems or from faculty consulting experience. And we still have to have some basic foundational courses.

Our plan is that a student will be able to complete all of this within two years, or four semesters. Adding the additional semester gives the students entree into actuarial jobs, or they can compete with people doing other types of risk management degrees. As I said, this will be operational in fall of 2005.

We've been very active in continuing education, particularly through developing an International Risk Institute. Jim MacGinnitie has been involved in it. Shaun Wang, our director of actuarial science at Georgia State, is taking the lead on our part in developing a curriculum for people who are already qualified. Much of it is for people who want to get certification and training in enterprise risk beyond the traditional curriculum. It's a joint effort of universities, various industry partners and professional bodies and hopefully will provide an avenue to integrate enterprise risk education into continuing education.

That's how we are trying to integrate enterprise risk into the academic curriculum. I hope I gave you a sense of how we think about it—what we think we can teach, what we have to be careful about teaching, particularly what must be learned on the job or developed in-house, and what our current approach to this is. Thank you.

**MR. BROOKS :** That was an excellent overview of the academic education perspective. Now it's time to hear from a risk manager, our second panelist, Lloyd Foster, who is an F.S.A. He is vice president of risk management for Transamerica Reinsurance in Charlotte, North Carolina. He's originally from Jamaica, where he lived for 30 years before coming to the United States in 1987. He's had various consulting positions and exposure to risk management and nontraditional applications of risk mathematics beginning at Prudential, where he spent seven years in various risk management roles. He holds a Master of Science degree in Computational Finance from Carnegie Mellon University.

**MR. LLOYD A. FOSTER:** What really constitutes practical enterprise-wide risk management? The first thing I will tell you is that the jury is still out. They may be out for a long time, and we can't wait for them to get back. Practically all risk management is model risk management. Everything we do here really is model risk. Why? One of the best models to use is a map. It shows the whole world, which is a good model; it's a model of what the world looks like. Think about the days when maps were very important to people going on journeys on ships. For virtually 90 percent of that journey, the captain of that ship could not see the destination. That map was very important.

This map, for the most part, was an approximation, and it wasn't correct. How could it be correct? It was somebody's attempt to represent on a flat surface what is a globe, the world. So you knew its imperfections going in. In fact, if you take a map and try to measure the area of Greenland according to the scale of that map, you know it's going to come out distorted compared to the actual area of Greenland, the country. That's how the Mercator projection works. Does that mean you throw the map out and say it's useless? Of course not. By the same measure, models are imperfect. All of them are imperfect. Therefore, the important thing is not the model, it's the person who's using it.

Let's say when you're flying back from New York to wherever you came from, you have a choice of just two planes. There's one plane that's in perfect condition, the most modern thing to come out of 2004 technology, but the pilot on it has never flown a plane before. The other plane is not so good. The wings look shaky and one of the engines doesn't work, but the person who's going to fly it is a veteran who's flown through every kind of weather, has brought planes back from everywhere and done impossible feats. You have no choice. You've got to take one of those planes. Which one would you really want to go on? It's not the plane itself. It's going to be the pilot.

When I say model risk is what it's all about, I'm talking about how you conceive the business, where it is, and where it's going. That model may be something that's very detailed mathematically like Sanjay described, or it can just be something in your head. Whatever you have as a concept of what the business looks like, that's

your model. Enterprise-wide risk management means we are going to see to it that this model represents your business world for real. In those areas where it does not represent your business world, we're going to find ways to get around it, the same way we have to get around imperfections of a map representing a globe. It is all about the mapping and, therefore, model risk. The task of enterprise risk management is to ensure this model is sound. It will provide good results for the people who are going to be using it.

Those of you who have had some exposure to risk management of some sort already understand the three basic ideas behind risk management. You're going to identify what it is that prevents you from achieving your goal. What is risk? It means here we are in the present, and there's the future, and we're going to do some things now to get to some particular kind of future we want. If any action you do today, regardless of what it is, would always provide the same result, there is no risk. Risk management arises because there are different things that can prevent you from getting the particular future you want.

The first thing you need to do, therefore, is identify what things stand in the way of your achieving that. The problem I've found is that people go overboard with this. They love the idea of identifying, and they'll show you how bright they are by asking, "Have you thought of this? Did you think of that? You didn't?" In fact, instead of enterprise risk management, it's now enterprise list management, and we never get around to doing anything about it. The list keeps getting bigger and bigger in a database, and it expands and expands. When we come to the practicalities of it, I want to make sure we keep our list short, including only things that are going to affect us right here. Later on we can get sophisticated and start thinking about what happens if there's a nuclear holocaust, although I don't see how we would care about that because there would be no one left after that to manage the risk. But don't get too carried away. Keep your list very practical; keep it very short. Be concerned about what matters now. Get practical, and get to the point that really matters right here and right now.

Then we come to measurement. Actuaries love to measure things, don't we? If you can measure what you're talking about, you know what you're talking about. And

maybe we also think the reverse. If you can't measure it, you don't know. But not in this instance. You don't want to get too carried away with measuring. In fact, at the current state of the art, if you claim to be able to measure operational risk, we know you don't know what you're talking about. Sometimes we get so carried away measuring things that we don't see the whole thing that we're supposed to be measuring, and we lose sight of the facts.

One example that comes to mind right away is that other people sometimes come to me when I'm all done and ask if I have considered the correlations. First of all, sometimes it's hard to find what the true correlation between different things is, but they don't want me to go one step further until I build them a very complete and complex correlation matrix. So now I have to sit down and spend a lot of time on this. The first thing you need to know from a practical perspective is that the idea behind risk management is to see what we can do to protect ourselves in times of crisis. In times of crisis, correlations usually tend to plus or minus one. Things that you think are going to happen will not happen. The things either go together or they go far apart. That doesn't mean you shouldn't be creating your correlation matrix; you just shouldn't be spending too much time fine-tuning it and saying if it's really 0.254 or .02539. If we're going to impart this education, let's make sure that people are understanding the practicalities of this and not just the theory.

I don't want people coming out of our education system and talking actuarialese and risk managementese, especially to audiences who are nonmathematical. You could get into trouble because people are listening to you. Because of the position you hold, they think you know what you're talking about, and they will make lots of important decisions based on what you say. People can take what they call statistics and facts and do lots of strange things with them, because they don't understand the background. If you're thinking in terms of enterprise, you must look at the background and not just what you call the "facts." These facts sometimes can fool you. If you look at the numbers or the facts only, for example, and not at what we are all about, you could look at world statistics and come to the erroneous conclusion that living is bad for your health, because just about everybody who has died so far was alive at some point. We have to get an understanding of the background, and the plain numbers alone will not tell you everything. I don't want

to turn out a group of students who have been very good at building mathematical models and are very good at formulas but don't understand fully what it is we're doing.

I can give you many examples where the numbers can be misleading. In the 1950s a group of graduate students in Stockholm, Sweden, doing a study found that there was a correlation of 0.99 between the number of babies born in Stockholm and the number of new storks' nests found in the suburbs of Stockholm. Now, people who don't understand reality could say, "Here is proof that a stork brings the baby." So, again, we need to emphasize less of this mathematical grounding. We have to have it, but I want the students coming out of this program to be practical and to understand that there's a lot more to risk management than just the plain mathematics.

You can measure it. You've identified it. Let's try and see if we can monitor it and keep things in control. That is where enterprise risk management is important, because people usually are monitoring and keeping their focus on one part: maybe the part that is interesting to them, maybe the part that's easy. Enterprise-wide risk management means interrelations. Are we trying to see the whole picture or just one small part? Enterprise-wide risk management reminds us that there is law of conservation of risk. Risk is not created. It's there. You substitute one type for another.

The best example is what happens at the airports. Five or six years ago, I used to wonder why the people checking me out were usually 18-year-old kids. I expected to find antiterrorist geniuses trained by the FBI and Interpol, but usually it was 18-year-old children who were doing it. You could see that they were bored, but I figured maybe they knew what they were doing. Well, they did know what they were doing. They were managing risk, and the big risk to them was the risk of running over budget. You hire children who are just out of high school; you can pay them a low salary.

Who was thinking of people who might bring bombs on planes and attack the country and blow up the World Trade Center? No one. What happened after 9/11?

Again, we go to an extreme, and again we are managing risk but not enterprise, because now I go to the airport, and there are soldiers at the airport with M-16 rifles. There's risk inherent in that, a big risk. Anybody can see that. Not to mention the fact that you're going through these checkpoints, and people look at you with a straight face and tell you to take off certain parts of your clothing. It's amazing, and nobody is looking at the overall picture of what it really means to manage the risk that we're facing.

Enterprise-wide risk monitoring is important because we want to be able to get the whole picture together, not just this part that I care about or I like, or this part because I did it in my graduate program at Georgia State or Carnegie Mellon, or this part because my boss likes to see that in the report. Enterprise means the whole picture. One part, for example, that is very hard to get is measurement that goes across functions. Let's say you're building a model. You're looking at currencies. You're doing this in the area in which the British pound goes up against the U.S. dollar, and the U.S. dollar goes up against the Japanese yen. Should you be wasting time building a part of that model where the Japanese yen goes up against the British pound in that scenario? You shouldn't. You'd be surprised how many models do, though, because it's the mathematics. It's just one little narrow focus that's going on and not the overall thing.

We need to have commonality of measurement as well. Just because we are going from one kind of thing, annuities, over to something else, mortgage, it doesn't follow that we're talking about the same thing we are measuring. We have to have a commonality. A Jamaican fisherman is arguing with a Trinidadian fisherman about fish, and the Jamaican says, "I caught a fish that measured five feet." The Trinidadian says, "That's nothing. Just last week I caught a fish that measured eight feet." The Jamaican says, "You're such a liar. That can't happen." He goes and calls his friend. "Were you there?" He said, "Oh, yes, we caught a fish that measured eight feet." The Jamaican says, "No, I don't believe it." "Yes, I measured it myself: eight feet from head to tail." The Jamaican says, "Oh, I see." The Trinidadian says, "What do you see?" "Well, you said eight feet from head to tail." And the man from Trinidad says, "So?" The Jamaican says, "Well, in Jamaica we measure the fish between the eyes."

Well, that one is made up. This one is not. In 1998 NASA sent up a spacecraft to Mars to explore. It cost \$50 million of our taxpayers' money, and the thing crashes on the surface of the planet and never sends back one picture to the United States. Why? Two teams worked on this. One team measured a ton at 1,000 kilograms, and the other team measured a ton as 2,240 pounds. A slight difference, and that slight difference was enough to cause great confusion, and \$50 million of taxpayers' money went down the drain. The big thing emphasized in *Risk* magazine in 1998 is that it happens. It happens to the best of us. If we're doing enterprise-wide risk management, we need to make sure that whatever we are managing and measuring, we at least understand the commonality of measurement that we're using, so we are not talking about two different things and going in two different directions when we do so.

Practically, there are some things that are going to be easy for us to convey. We're going to be talking about things like swaps and credit defaults. The way we do actuarial mathematics today is going to be very similar. For example, your net annual premium is that value of a premium that makes your expected net loss equal to zero. Your credit rate, your swap rate and so on are defined similarly, and so the whole mathematical structure is going to be the same. What worries me is that, for some reason I can't understand, actuaries have a problem with the concept behind risk-neutral pricing. It should be the simplest thing in the world, but they don't understand it. I notice we are taking ordinary calculus out of our curriculum. That's fine. You might even want to take out statistics. However, we need to introduce a course in stochastic calculus. If we do that, at least as far as the Girsanov theorem, I think the students coming out of here will not say embarrassing things like "That cannot work. I don't see how. That's the risk-neutral price, but this is the real price." It's indicative of someone who is not sure what they're talking about.

From a practical point of view, if we're going to introduce a risk management program into the Society of Actuaries, I also want to see us introduce some basic elements of stochastic calculus. Even though I've been very lighthearted, I'm deadly serious. It's not a joke; it's a very serious thing to do. After everything I've

told you, it's still going to be difficult to make sure that this works and pulls together because, as Sanjay pointed out, it's difficult to do. You've got to first identify what we can do, what we can't do, and be very careful we don't overlap them. I am 100 percent behind this endeavor if we decide to go that route. I want to be around to make sure we do it right. I think we can do it right, and if anybody's going to be doing it right, it's going to be us. Thank you very much.

**MR. BROOKS:** Thank you, Lloyd, for a very relevant and entertaining way of describing the practical world of risk management. One thing I've picked up from Lloyd is that maps and models are just imperfect representations of the reality. He talked about trying to measure the area of Greenland. I took a philosophy course once where this professor tried to tell us that everything is just an imperfect representation of a perfect concept. You can't see the real chair you're sitting in, because that's a perfect concept. You're sitting in an imperfect embodiment of chairness. The hall, which, of course, you can't see, is a perfect hallway, but when you see it, you can't see the hallwayness. You just see the imperfect embodiment. I wish I remembered my actuarial science as well as I remember some of that other stuff.

We're delighted to have Margaret Resce Milkint here to talk about the real world of employment opportunities for risk managers, where they're coming from today and how actuaries can see some of these opportunities. Margaret is a partner at The Jacobson Group, where she handles executive management and actuarial searches on national and international levels for Jacobson Executive Search. Her search expertise spans just about all the disciplines in the insurance world, from actuarial, underwriting, claims and legal to information technology, sales and marketing. Prior to her 20-year career with The Jacobson Group, she had a stint with Allstate Financial Services in Northbrook, Illinois. She has a bachelor's degree from the University of Illinois at Urbana-Champaign with a concentration in English, French and marketing. Welcome, Margaret.

**MS. MARGARET RESCE MILKINT:** The theme of this whole session is about change and how as a profession we can move forward. Change does require new attitudes and new realities. It's an interesting time that we're living through. I'm

going to bring this to the real world and talk about what we're facing today in the labor market, what your obstacles are to entry in enterprise risk management and hopefully give you a few recipes to get there.

Let's talk about the state of the market, because that's a good place to start from a foundational standpoint. The general economy has been up and has been down. We've been hovering around 5.4 percent in unemployment. Insurance unemployment hovers at 3.3 percent, but actuarial unemployment has been virtually nil. You've really been insulated through the economic downturn, and that's good news. In the industry employment outlook, the expected growth in actuarial is 11 percent and overall insurance employment is 7.5 percent. So, again, more good news for actuaries.

We really believe there is a war for talent, though a lot of people said it went away. I say it never did. Our clients are always looking for the best and the brightest people. Right now, because the economy has upturned, it's not robust out there, but it's better than it has been over the last two to three years, and that again is good news. People are ready to change. They're ready to look forward. They're out of the bunker mentality that we were all in after 9/11.

Here's an interesting fact for you. Did you know that every eight seconds somewhere around America someone is turning 50? The boomers are aging, and it is an aging workforce. Where is the new workforce going to come from? We're talking to our clients today about taking a hard look at the mature worker and what they can do in their organization. For all of us who are going to be working a lot longer than perhaps we thought we would, it means we will probably have new careers and new professions. Obviously enterprise risk management factors into that.

There has been evolution and revolution in enterprise risk management. I've known Lloyd for most of my career, and he has always been this funny, and he has always been this passionate about enterprise risk management. It's not new, but today it's exciting because it's in the forefront. I was at the Society of Insurance Financial Management conference recently. Howard Smith was the keynoter, and he was

talking about trends in the industry. He said enterprise risk management will be a hot topic over the next one to two years. I say longer. Because of the emphasis the rating agencies are placing on enterprise risk management and because they are starting to factor that into their scorecard, it's going to play a big role in the actuary's entree into this area.

I would like to share with you some other industry leaders' perceptions of enterprise risk management and our profession. Helen Galt, F.S.A., M.A.A.A., who has spent the last 30 years of her career at Prudential, focused on risk management before it was fashionable. She said, "Actuaries are in the best position to know what needs to be done next. We understand the guts of products, the drivers of risk, how to model that risk." This is exactly what Lloyd is talking about and what Sanjay is teaching about. "Actuaries are uniquely qualified to pull it all together in an integrated structure." That's the key word there—integrated.

Here's another perspective from Gail Ross, F.C.A.S., M.A.A.A., the past president of the Casualty Actuarial Society. She uses the same terminology that Helen did, even though these were two separate interviews that I did with them. "The actuary should be the 'integrator'... We can't do it all but we can partner and work collaboratively to assess, model and develop risk outcomes." Think like a CEO or a CFO. Think about results and deliveries. What do they want? They want it simple. They want to understand what it's about. They don't want to know it down to the tenth decimal point. They want to understand. If you want that place at the leadership table, you have to speak the language of business.

In an article published right after 9/11, Jerry Miccolis, F.C.A.S., of Tillinghast Towers Perrin said, "Going forward, stakeholders will insist on the more rigorous exposure management, scenario testing, response preparation and capital management that ERM [enterprise risk management] encompasses." I think his prediction has rung very, very true. We're at a turning point and a crossroads in our field and in our profession.

We did an analysis at The Jacobson Group on some positions that were posted on local and national job boards. By industry, only 5 percent of the enterprise risk

management positions are in insurance. In contrast, 60 percent are in consulting firms. Consequently, we have to move out of the traditional insurance sector if we want to move into enterprise risk management. I believe that that percentage is going to grow in insurance, and Lloyd can back me up on that, and hopefully Sanjay as well. Today as we enter this field, we have to look more at nontraditional positions. You have to look into consulting, into banking, into wider financial services. In an analysis by role, it's interesting that 47 percent is in auditing. The next highest area is IT. It's very interesting what that analysis showed.

I'll tell you what some positions actually look like that are out there today, what these companies are looking for. Here's the description for an Associate Director of Enterprise Risk Management for the Chicago Mercantile Exchange. The functions include risk management strategies and risk management process, as well as ensuring adequate communications and information for decision making. The requirements are an undergraduate degree in business, math, finance, accounting, economics or related field. I guess that's us. A graduate degree is desired, M.B.A. preferred. They're looking for 10 years in risk management, financial services or audit and experience in assessing risk and internal controls. I say an actuary can do this job.

The functions of Director of Enterprise Risk Management for U.S. Bank include moving the enterprise risk management function to a more strategic and analytic one. They are looking for a person with the senior level of enterprise risk management necessary to make the evolution occur and to make recommendations to the CEO and management committee for changes to address weaknesses. They are looking for a bachelor's degree, five to seven years of risk management, 10 years of banking, Sarbanes-Oxley knowledge and risk certification.

In another example, the Director of Operational Risk Management for State Street maintains the corporate operational risk management policy, promotes operational risk awareness and consults with the business units. As you read position profiles, you need to think about those key words that these employers are looking for and then tailor your presentation or even your resumé and your cover letter to suit these positions. Again, a bachelor's degree required, master's preferred, 10 years

of industry experience and five years of risk management. They are looking for the ability to think effectively with senior management, to sit at the leadership table, to think conceptually, and for strong interpersonal, organizational and communication skills. You're going to see that as a theme. It's not going to go away. They also ask for the ability to lead and contribute to multijurisdictional working groups.

The description for a Vice President of Enterprise Risk Services for a consulting firm on the East Coast is seeking a thought leader in defining and implementing operation risk and enterprise risk services. What we are seeing in the marketplace is that there's still pioneering going on. A pioneering role really does require someone with innovation, imagination and an ability to communicate as well as implement change and results. They want leadership skills, strong results, operational risk and enterprise risk management practices. It sounds like an interesting and exciting role. They're looking for a CPA, CIA, CCSA or an alternate risk-related qualification. I think our role should be included there; there should be an actuarial designation. They want superior written and verbal skills and, what's really important, highest standards of integrity and credibility. Out in the marketplace, companies are not afraid to talk about your character. They're not afraid to talk to you about your integrity, your philosophy. It's out there, and it's not going away, and that's good news.

The last description is for a Senior Analyst role with GMAC Residential. They're looking for a Ph.D. or M.S. in finance, economics, mathematics, physics, engineering or statistics. Again, we don't see actuarial science, but we're getting closer with the mathematics. They're also looking for modeling, pricing, derivatives and analytics. Again, they include people skills and sound business judgment. These are just five positions that are out there, and we're seeing that number grow every day.

Who's your competition? How are you going to go out there and enter this field? You are facing M.B.A.'s, chartered financial analysts (C.F.A.'s), financial engineers and risk managers. How many of you in the room are M.B.A.'s or have master's degrees? That's a good number. Are there any C.F.A.'s in the room? That's good. What about financial engineers? That's very good.

We are seeing more and more of a movement toward the actuary becoming an M.B.A. or C.F.A., getting additional training. That's what you have to do to beat and face this competition. I was at an insurance executive forum in Chicago. The Risk Management Officer of Verizon was there, and she talked about enterprise risk management and what they were doing at Verizon. After her presentation, I introduced myself and asked her if she was hiring actuaries. She looked at me like I had 16 heads, and she said, "Why would I do that?" I think our challenge is to help people like that say, "Why wouldn't I do that? Why wouldn't I hire an actuary?"

There are some negative perceptions out there about actuaries. I say this very honestly to you; I've been an ambassador for your profession for many years. This is what we hear: "Actuaries are one-dimensional. They can't do the job. They can't transfer their skill sets. I don't understand a word they're saying." I think those actuaries who are going to be able to make this transition are the ones who are going to be the communicators, the leaders. They are the ones who can sit at the leadership table and not talk actuarialese but talk the language of business. That's how you'll get respect. That's how you'll get noticed. That's how you'll move into this area.

I want to juxtapose the enterprise risk management definition with the definition of actuary. You all know what enterprise risk management is and what that is all about. Let's look at Carl Westman's definition of an actuary. It is very plain and easy to understand: "An applied mathematician responsible for the financial soundness in insurance and pension systems. In a larger context, actuaries have been described as the professionals to call wherever money and probability interact." If you are building your case, you need to be able to show how what you do transfers to what enterprise risk management is all about. It sounds very simple, but that's the first step.

The second step is to confront the barriers to entry. If they think you're a poor communicator, change that. They think you lack knowledge and operational perspective. Again, it's about the business. I think the field is changing. When I first started out 20 years ago, actuarial professionals would tell me, "I fill in this number

on this page." I'd say, "But why, and where does it go?" And they didn't know. Today I contend that you know. The field has evolved and the days of the green eyeshade are gone, but I think that's just in the insurance world. We all know what actuaries can do and the strength and the power that you bring to the table, but now our challenge is to get it out there in mainstream business.

We're going to hear a lot about branding. Branding is your image, who you are, what people see when they see you. We're going to have some help individually, because the Society's branding campaign makes a lot of sense. I'll say I'm delighted to see that, because for a long time there have been lone voices saying actuaries can do that. Actuaries can be CEOs. We have one right here. Actuaries can be CFOs. Actuaries can move into a lot of nontraditional sectors, but it takes the profession to mobilize together as you are and go out there and make other people aware of how good you are. The "well-kept secret" theme is incredible because it's true. A lot of people don't know the power that the actuary can bring to the table, that you can influence decisions and can change attitudes, but it is going to take time. It took a long time for the image to occur. Individually, those of you who are interested in moving into nontraditional roles will have to be aggressive. There are barriers, and you can't pretend like they're not there. You have to go over the wall with this, and you have to have some fun doing it.

You want to prepare to win. We are seeing a lot of people as individuals, as well as in corporations, hiring executive coaches. These coaches will help you refine your marketing package. They'll help you learn how to interview. They'll help you learn to speak the language of business and get you comfortable. I have seen some great executive coaches. If you're interested, I can certainly give you some recommendations. There are some Web sites out there that are terrific, if that's what you're interested in doing. Enhancing your pedigree—getting an M.B.A., a C.F.A. or an A.R.M.—is a way to validate your credentials to the outside world and augment your actuarial background. You also have to get out there and get that visibility. The Society has great meetings, but so do a lot of other organizations. At the Society of Insurance Financial Management, there were only two actuaries there. Sitting at the table with C.P.A.'s or C.I.A.'s and going to other industry functions are good ways to increase your scope.

There are some interviewing trends that you may want to be aware of. We could do a whole session on behavioral interviews. This is something that is not going to go away. People like behavioral interview questions because they really focus you on telling your story, on giving a real-life example of how you've handled a situation. I always like to ask, "What risk did you not take that in hindsight you wish you had?" That gets down to the very core of who you are. When you get a question like that, it's not a technical question. It really gives that interviewer a chance to get inside your head. These are the kinds of questions to think about as you're preparing to go on interviews.

Another interview trend happening right now is the situational interview. You are put into a hypothetical situation, and you have 30 minutes to solve it. For example, you've just been served a sexual harassment suit. How do you handle that? What are the things that you do? This is a way they can see how you would react as a manager under pressure to a real-life scenario. It requires you to think on your feet. Sometimes it's not whether your answers are right or wrong. The situational interview demonstrates your poise, how you handle yourself in a situation like that, whether you keep your head, and if you can think logically.

Psychological assessments are very hot right now. We are seeing more organizations, because of the level of scrutiny that we face in the hiring arena, use a lot of online testing. There are also a lot of face-to-face interviews with psychologists, where you'll actually spend two or three hours with the psychologist doing an interview. Sometimes there's a written test. We're seeing a lot of these trends, not just at the officer level, but even at the director level and below.

Sarbanes-Oxley has touched all of our lives. The silver lining is that we're not afraid to talk about integrity. A lot of companies are asking all of their candidates what their integrity statement is; they're giving you an opportunity to give them a sense of what you're made of. The ethics that the Society of Actuaries has always had will serve you very well.

The CORE technique will help you get ready for these types of interviews—character, outlook, relationships and expectations. The best interviews are when you go to the table and you unmask. You let people know what's inside your head, what drives you, what's important to you. That makes a difference. What are your relationships? What are your expectations for an employer or yourself? If you go to the table with your mask off, you're going to have a lot better chance of breaking that barrier to entry.

What do employers want? Yes, they want it all. It's nice to even add a sense of humor. Collaboration, staying power, great communication skills, versatility—all of those things are skills and abilities that employers want today. Enhancing those and showcasing them in your presentation will make you a standout candidate.

This is a great field for the actuary. Who better to serve enterprise risk management than the actuary? I think the future is here, and the growth is here, and it's great to see that you have the support of the Society as you endeavor. Thank you very much and good luck.

**MR. BROOKS:** Thank you very much, Margaret, for another well thought-out message from somebody outside the actuarial profession, a message of challenge and encouragement that I know we'll all take to heart.

**MR. DWIGHT K. BARTLETT:** I'm a self-employed consulting actuary. It seems to me that personal financial planners who prepare retirement plans for their individual clients produce plans that aren't worth the paper they're written on in most cases. They're overly simplified, and they're Utopian. They typically ask the client to prepare an estimated budget of what it's going to take to live in retirement and then to calculate the expected Social Security old-age benefit and the corporate pension plan benefit if there is one. Then they tell them what they need to save to fill the gap for retirement. They may recognize certain risks like mortality risk and recommend a certain amount of life insurance, a certain amount of disability income insurance and, more recently, long-term-care insurance, but they fail to recognize what I think you have described as enterprise risk. There are a lot of risks out there, some of which aren't exactly insurable, like unemployment risk,

adult-children-moving-home risk and risks like that. Should actuaries attempt to move into this field more aggressively? Or should the training curricula for personal financial planners incorporate some of this concept of enterprise risk management, given there obviously are limitations to what individuals can pay for the preparation for a retirement plan or a financial plan?

**MR. BROOKS:** Dwight's really bringing enterprise risk management down to a personal level of actuaries helping individuals or helping people that help individuals. How many people have had one of these financial plans that he's talking about? I had one. The first time I had one I told them I wanted to set the assumptions, but they did it without my setting the assumptions. I told them to throw that one away. I wanted three scenarios so I could evaluate the risk.

**DR. SRIVASTAVA:** I couldn't agree with you more. I do see people and programs developing along the lines that you suggested, but I don't see them coming out of financial planning programs or actuarial programs. I see much more interest in what we call wealth management or more integrated views of lifetime consumption, investment and so on, primarily rising out of parts of financial risk management. But I think that many of those programs coming from that bias tend not to look at disability or Social Security or unemployment risk and so on. There's a very fertile field over there, but I don't see it coming right now from the actuarial side. But I certainly agree with you.

In fact, along those lines, one of the experiences I had was developing wealth management programs for less wealthy people. If somebody has a high net worth of about \$100 million, there might be a team of eight people working on this person's financial plan. The problem is when you come down to a person with \$10 million, you can't dedicate eight people to it. The revenue flow doesn't justify that. So the problem is how do you provide high-end wealth management services to less wealthy people, of whom there are a larger number. Also, some of them might become more wealthy as time goes on. That's a segment that I think is not well served by either academic programs or professional programs, but there's a great opportunity.

**MR. DAVID W. DICKSON:** I've got both a success story and a question. At GE, they've been all over enterprise risk management for many years. About five years ago, they installed a risk management department at our insurance company that was an equal of and side by side with the actuarial department. Our CRO is not an actuary, which naturally created a lot of tension within the two departments. However, in the past year most of the hires within the risk management department, even though it remains led by a nonactuary, have been actuaries, including a lot of crossovers from our actuarial department to our risk management department. Our chief life and health risk officer is an F.S.A. The two departments now consider each other peers and work very closely side by side, so I think that's a success story. I have a question, though, for all three panelists. I understand, Margaret, your idea to go out and enhance your credentials. Get a C.F.A. or something else. And I agree with that. I think in a transitional period we need to do that. But how do we get it to the point that being an A.S.A. or an F.S.A. is sufficient for someone to consider you for a risk management position without the additional C.F.A. or M.B.A.?

**MS. MILKINT:** Your success story is great. That's what we're all working toward. Ideally, you want your credential to stand alone. You want that F.S.A. to mean something, and that A.S.A. as well. Unfortunately there's a lot of work to be done before we get to that point, because there is a mentality out there that actuaries can only do this. We have to break that down, and the Society is taking a great step with this image enhancement campaign, but I think it must be grass roots. It must come from every company and every chief actuary and every program that's out there. Everybody has to have a voice in this. And it's going to take some time. It's not something that's going to happen overnight. I've heard others say it's a 10-year process. I'd like to see it happen faster, and it may happen faster in some organizations that are more receptive to it. But it's going to take work. It's going to take these success stories and our talking about those success stories and human resource departments saying, "Let's open this up to actuaries." We often get searches that ask for a C.P.A. They don't want an actuary. Then you have to do a marketing job. And it's easier for you on the inside to do that marketing job in your companies than it is for an outside consultant to do that.

**MR. FOSTER:** Paradoxically, I think the way to do it is to continue with the trend of including other qualifications along with the F.S.A. The more you get exposed to C.F.A. disciplines and risk management disciplines, the more you begin to see that we can begin to introduce this in the actuarial program, it begins to filter into our educational system. We begin to add it to it. Before you know it, you begin to wonder who needs to do this three-year course over there when we are already including all of it in our program anyway? Starting, for example, to include enterprise-wide risk management as part of actuarial science is a step. We got there because some actuary was bold enough to take some courses or do some reading about enterprise risk management. Open yourself up to different courses that are out there. The more you do it, and the more you filter it to the rest of your peers, and the more the profession accepts them, the more we'll eventually reach the point where actuarial science is a standalone thing for just about any kind of risk management project.

**MR. BROOKS:** Sanjay, maybe you can take a minute or two to elaborate on this plan for an International Institute for Risk Management. In this connection, who's the target audience? How is that going to work?

**DR. SRIVASTAVA:** We concluded that if we simply added enterprise risk education to a standard actuarial curriculum, it wouldn't necessarily signal to the outside world that the graduates coming out of our program would be qualified for other broader and not narrow actuarial work. The bet that was taken in creating this dual degree and trying to simplify that process was that we needed a second degree or qualification to be able to signal to the outside world that there was a broader training available. The Risk Institute is the attempt to provide that bridge for working professionals and to think about how a risk certification might be developed that is specifically targeted toward people working in the actuarial profession.

**MR. DICKSON:** Let me throw a little more controversy into it. Do you think it would be a good idea to support perhaps a lesser designation sponsored by the Society of Actuaries similar to what we do with pension actuaries, the E.A., for enrolled actuaries?

**MR. FOSTER:** That's an interesting concept. I guess we'll have to think about that. My first reaction would probably be no, but I am reacting without much thought about it. So don't take my no as a total negative.

**ROBERT J. LALONDE:** I'm on the Education and Examination Committee. There is an extension to Part A covering enterprise risk management that students or people studying to be an actuary can take. We are giving some materials so that people can get an idea of what risk management is. I saw an announcement by a large European insurance company, a multinational with operations in a number of different places. They announced that a new chief risk officer had been appointed. This company had a reputation of hiring U.S. actuaries in senior positions, but I was surprised to learn that the position had been awarded to a person who was not an actuary. However, the reason they awarded him the position was because he was able to use the capital markets to move risk around within the enterprise, free up capital, so that it could be used in other places. When you think about it, that means we may not be properly changed, because I think only a few of us would have ever thought of that as a solution. We would think of more classical solutions. So maybe that's where we have some shortcomings.