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Education and Examination Redesign

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The actuarial profession faces new challenges and opportunities in the future—within traditional areas. Anticipating such developments, the Society of Actuaries' (SOA) Board of Governors named a task force to determine how, within the context of basic education, the SOA should respond to the challenges of the changing professional environment. The recommendations of the Board Task Force on Education focus on underlying principles to govern the SOA's basic education program. The recommendations of the task force were approved by the SOA board in January 1995. This session is intended to provide you with up-to-date information on the redesign effort and the governing principles that guide the design process. Audience members were also offered an opportunity to provide input and ideas. It is critical that the SOA's basic education system be the best possible, and we want your help in attaining that goal. Suggestions made by participants at earlier sessions have already affected the design.

Mr. Jeffery G. Allen: I'm the education actuary on staff at the SOA. With me on the panel is Rob Brown from the University of Waterloo. Rob has been a member of the Board Task Force on Education since its inception in 1994. I, in my role at the SOA, have been working closely with the Board Task Force on Education, as well as the design team. We'd like to take you through the education redesign initiative. Table 1 shows the current thinking regarding the design structure.

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TABLE 1
CURRENT THINKING REGARDING DESIGN STRUCTURE—NOVEMBER 1995
REQUIRED OF ALL CANDIDATES FOR FELLOWSHIP

BASIC

- Course 1 Management and Quantitative Assessment of Risk**
Covers how risks affect organizations and individuals along with mechanisms for managing risk. Emphasizes fundamental tools for assessing risk, and requires calculus and probability.
- Course 2 Interest Theory, Economics, and Finance**
Interest theory—discrete and continuous. Study of microeconomic and macroeconomic theories. Fundamentals of finance, including financial management, fundamental concepts, capital budgeting, strategic long-term decisions, and multinational financial management. Assumes calculus, probability, and mathematical statistics.
- Course 3 Actuarial Models for Contingencies**
Theoretical basis of actuarial models for contingencies and applications of those models to various financial risks. Builds on concepts and theory presented in Courses 1 and 2.
- Course 4 Methods of Actuarial Modeling**
Introduction to the modeling process including benefits and limitations, stochastic versus deterministic models, model selection, analysis of input, analysis of output, sensitivity and credibility testing, communication of results. Methods include regression analysis, forecasting, survival analysis, credibility theory, analysis of loss and frequency distributions, and simulation techniques.
- Course 5 Application of Basic Actuarial Principles**
Basic actuarial principles of plan and product design/applications of design to coverage for contingencies; risk classification principles and techniques; actuarial principles and practices applied in pricing, ratemaking, and funding; marketing/distribution/administration; actuarial techniques for valuation of liabilities and funding across various coverages.
- Course 6 Finance and Investments**
Basic actuarial principles in the fields of investments and asset management. Covers investment vehicles and markets, application of asset/liability management tools, applications of derivatives, and principles of portfolio management.

Table 1
(Continued)**ADVANCED****Course 7 Applied Modeling—An Intensive Seminar**

Covers practical considerations of actuarial modeling, application of modeling to unstructured problems where appropriate; model design/selection; data input analysis—assumptions and underlying data; data output analysis—validation, sensitivity testing, credibility testing; communication of results. Focus on real-world applications from speciality practice areas.

Course 8 Advanced Actuarial Practice

Advanced actuarial practice specialty areas covered include group life and health, retirement systems, individual insurance, financial and investment management. Topics covered should include principles of product design and distribution, pricing/funding, and valuation of assets and liabilities.

PROFESSIONAL DEVELOPMENT COMPONENT**FELLOWSHIP ADMISSIONS COURSE**

To begin, I'd like to give a brief overview of the redesign effort. In early 1994, the SOA board appointed a task force on education to evaluate the education needs of actuaries, and how the SOA can best meet those needs. In January 1995, the Board Task Force on Education presented its conclusions to the SOA board. In those conclusions were four principles to guide the redesign effort. It also included and identified four categories of education that should provide the structure for the education system.

Early in 1995, the board adopted those principles and categories to guide a complete redesign of the SOA's basic education system. Last summer, in 1995, the task force released its first report to the membership, explaining why the changes were needed and what those changes would mean for the education system.

Since that report was issued, a design team has been established, which has been actively developing a redesign system. It has also been wrestling through various issues associated with that redesign. Also, during this time, the SOA has been working closely with the other actuarial organizations, including the Casualty Actuarial Society (CAS), the Canadian Institute of Actuaries (CIA), and the American Academy of Actuaries (AAA). I'd like to elaborate on the work that's being done with the CAS. The CAS has a member on the SOA's board task force. The CAS has two members participating on the SOA design team. And the SOA also has a member on the CAS Task Force on Education. So as you can see, the two organizations are working closely to develop joint exams at the early stages. Rob Brown will discuss some of the opportunities for joint courses.

That gives you a short overview of the process so far. The other items we would like to cover in this session include: 1) the principles and objectives for the redesign, including the four categories of education identified by the board task force; 2) a report on the current status and the plans for the future; 3) discussion on how input is being implemented throughout the entire process of the redesign; and, 4) a description of the current state of the design. We'll also discuss some of the other key issues involved. We'd like to move through this rather quickly, so we have sufficient time for questions and comments at the end.

PRINCIPLES AND OBJECTIVES

The goal of the redesign has been to enhance the distinctive competencies of the actuary. The best way to identify those distinctive competencies is by first defining what an actuary is. The working definition that has been used by the task force is that an actuary is "the professional who assesses and manages financial aspects of risk and uncertainty." I think there are two points to make here. The first is the emphasis on financial analysis, and the second is the emphasis on mathematics of risk. And what's even more important is the intersection of those two. And where the actuary is unique is in his or her ability to meld the financial analysis with the mathematics of risk.

As the task force discussed and analyzed this definition, it led to its identifying the following types of distinctive competencies that are to be enhanced and encouraged by the educational process. First, there is unstructured problem solving and flexibility. These aspects are more and more critical with the rapidly changing business environment we all find ourselves in. Along with flexibility, there's the need for adaptability to change and a tolerance for ambiguity in unstructured environments. Also, there must be an emphasis on expertise and modeling techniques, and that's not just to be applying ready-made models to specific situations, but it's also to be trained in the entire modeling process and to be able to adapt and apply modeling techniques to a wide range of situations involving many different aspects.

Finally, there must be an emphasis on global thinking. It's critical to the actuary to have an overall big picture outlook, especially in the current environment. We can enhance those distinctive competencies. However, for the actuary to be sought after as the professional who assesses and manages financial aspects of risk, we really must be able to demonstrate the value that's added by an actuary. I think we've all seen that this is increasingly critical in our current roles, but I think it's even more critical if the actuary is to move into new roles and into new markets.

At this point, I'd like to discuss some of the principles of redesign, as identified by the task force, and as adopted by the board. The first principle is to examine only

those subjects that cover essential elements of an actuary's education. The second principle is to provide a business context with rigor, consistent with that of the current mathematical education. I think the key is to maintain the level of rigor of the current mathematical education. This principle has led some to fear that in increasing the emphasis on business topics, there may be a devaluation in the rigor of the mathematics. The task force believes that we can increase the emphasis on the business topics without devaluing the mathematical expertise.

The third principle is to include all kinds of contingencies, not just life contingencies. This would include life, pension, health, casualty, and various other types of contingencies. It would also include models from outside the insurance and the pension fields.

CATEGORIES OF EDUCATION

The task force believes that these four principles suggest a restructuring of the education system into four categories. The charge then is to obtain each category of education from the best available source. So as I describe the following four categories of education, I'd ask you to consider the goal of obtaining each category from the best source.

The first category is preliminary education. This would include those subjects that are necessary, but not necessarily actuarial. They are subjects generally taught in universities and colleges and include calculus, linear algebra, differential equations, probability, and statistics. Later, Rob will address how subjects such as calculus and probability have been incorporated into the system redesign.

The second category is basic education. This category includes subjects that are actuarial in nature and encompass significant mathematical rigor, and are encountered within a business context. This category includes subjects such as contingencies and risk theory, credibility, and loss and frequency distributions. It's not a surprise that the task force believes the best source of education for this category to be the SOA.

The third category is advanced education. This category includes those subjects that actuaries working in a particular field would require. Those subjects would remain relatively stable over time, and would not be primarily country specific. Again, it's not a surprise that the task force believes that the SOA is the best source for this category.

The fourth and final category is professional development. This includes those subjects that are highly specialized, primarily country specific, and can change quite rapidly over time. My background is in health insurance, so I would look to

the health area to provide an example here. If the need for advanced, highly specialized education, such as for actuaries working in managed care or integrated delivery systems, is in provider financing and is what is needed most, the SOA may not be the best available source. In that situation, the best source would be an organization that focuses primarily on health care/provider financing.

This provides you with a summary of the four principles that were adopted by the board. And the four categories of education that were identified by the task force and adopted by the board. At this time, I'll turn the discussion over to Rob Brown. Rob will discuss the current thinking on the design and the issues related to it.

Mr. Robert L. Brown: The material that Jeffrey has reviewed for you was contained in a document that you should have read a year ago, describing the principles that the task force had placed before the Board of Governors, and that had, in effect, been approved. Now we're going to go through what has happened since then, and we're going to give you a preview of a document that you should be receiving about the middle of August 1996. We're going to ask for feedback today, but we're also going to ask for feedback when that material goes out in August. None of this is carved in stone yet. We are still very flexible. We're still seeking a lot of feedback and, depending on what you tell us, it could change and, in fact, it could change dramatically. There are a number of clients we're trying to satisfy here. Obviously, we want to create the best possible actuary suited for the next century. So we have clients who are actuarial students. We have clients who are employers, and we are also a client trying to work with the CAS, and other actuarial organizations. We have an interest in working and fitting in with programs that already exist at colleges and universities. There are many forces that we're trying to satisfy.

We also have a force called the existing fellows, who tell us in fairly bold statements that if they sense that the value of Fellowship has depreciated one iota, then the tar and feathers will not be far behind. So we have that concern that's fairly front and center.

COURSE DESCRIPTIONS

Table 1 is one example of how feedback has caused us to change some of the details, because the very first course, Management and Quantitative Assessment of Risk is now a little bit different than the way it's described in the handout. If you read the handout, it says you should come into Course 1 knowing calculus, probability, and some introductory statistics, and we're going to give you a course on risk assessment and risk management, not risk management in the sense of the profession, but risk assessment and actuarial management of risk. Well that's changed a little bit because we were told that it was important to make sure, at the

earliest point, that the students entering the syllabus had a good grounding in mathematics, and in particular, calculus and probability and introductory statistics. We needed to keep that front and center.

So Course 1 now is going to have very solid demands in calculus and probability, but the questions that will be used for Course 1 will be in the business context of risk assessment. And there will be at least a study note that will be sent to the students to tell them about management of risk and risk assessment techniques. But it won't require going to a particular school or being in a business program, or taking risk management at a college. That won't be required. So the same type of student that could write Course 100 and Course 110 (or Part One and Part Two), will be exactly suited to writing Course 1.

Course 2 is Interest Theory and Economics and Finance, but not economics 101, because that's preliminary. Students should already have a background in economics 101. There will be some macroeconomics and some mid-level microeconomics and finance. You all know what interest theory means. You can see, therefore, that in Courses 1 and 2, we're attaching a business context to the math that you need to know, at a very early stage.

I'd like to contrast that with the syllabus that we have today. I'd like to submit to you that it is possible today for a student to write four or five exams, and not have a clue what an actuary does. In the restructuring you're going to know immediately what it is that an actuary is hired to do. Also, let me point out that depending on the program that you're in, you might write Course 2 first. I would think the average business student would write Course 2 first, and then Course 1, and the average math student would write Course 1 first and then Course 2.

You're not going to be able to write these exams in your freshman year. And that's part of the feedback that we've had. It could take five terms in a nonactuarial science major before you can really get into this program. And that contrasts to people now being able to nibble away at things like numerical methods and operations research and calculus and probability at an earlier stage. So there's some pros and cons there that we're very conscious of, and you may want to give us some further feedback about these things.

At the moment, the CAS appears to be wanting to cosponsor Course 1. We've had some discussions with them about Course 2. They think that there's more interest theory than they need. They've never had as much compound interest theory as the SOA has had on its syllabus. And we're talking about what we can do to move some things back and forth, and to make it possible for them to jointly sponsor that

exam. We're really trying to maximize joint sponsorship between us and the property/casualty actuaries.

Course 3 is Actuarial Models for Contingencies. Notice there are no life contingencies here. Jeffrey mentioned this before. Course 3 would deal with all contingencies. I would even extend the list to include life, pension, health, property/casualty, and business contingencies. We could also include municipal bond default rates and liabilities for frequent flyer programs. Those are all good actuarial problems that require actuarial modeling. So that would be the type of thing that we would like to put in the course. We are probably not going to get joint sponsorship here with the CAS.

Course 4 is Methods of Actuarial Modeling. For those people who are close to the syllabus now, this maps fairly closely into subjects such as loss distributions, credibility theory, frequency distributions, and so on. This course will address how to model the type of problems that come to an actuary. But I would suggest to you that this is going to take modeling of actuarial problems to a higher level than now exists in the actuarial syllabus, and we are suggesting to you that this is a legitimate need for the next century. Actuaries will be called upon because of their modeling expertise in the area of assessment and management of risk.

What we're trying to do is present a consistent theme that applies throughout all of the course material. The theme is: you are modeling to solve a problem in the assessment and management of risk. And every exam is going to have that as its theme. There will be that consistent business context throughout the syllabus.

Course 5 is Application of Basic Actuarial Principles. For those of you close to the syllabus, I would suggest this would come close to being the total of what is now in Courses 200 and 210, excluding time and nation-specific material. So you will not have a question on what is the OASDI benefit for a 37-year-old widow with a blind child, age 19, attending school full time. That will not be the material that you will learn. Although, in describing the achievement of economic security, OASDI may be presented as one of the world's possible models. So Course 5 then will also have some pricing and funding and reserving techniques and some of the investment topics that would now be in Course 210.

Course 6, Finance and Investments, would be the totality of today's Courses 220 and 230 without time-specific or nation-specific material. So it would include investments and asset management. We don't expect that the CAS will be able to cosponsor Course 5 and I don't think they really ever would be able to. I don't think there's a way to modify it so that it would mesh. We think that there is a high probability that the CAS will cosponsor Course 6.

After Course 6 is where we're suggesting the ASA would go, and that's very consistent with where it is today—at the end of the 200 series courses. After the ASA courses, we have an intensive seminar in applied modeling. The closest thing today to the new Course 7 would be Course 152, the intensive seminar. But we're trying to achieve a lot of things in this new Course 7 and, in fact, we may not be able to achieve them all, but we'd like this to happen on a remote site. This is not going to be correspondence, mail out, mail back, write an exam. We want to achieve the concept of working in teams. We want to achieve the concept of report writing. We want to achieve communications. You're going to have to make oral presentations. You're going to have to present results. While it says applied modeling, there's a lot more goals in here than just advanced modeling.

There are a number of issues relating to the intensive seminar. How many days will your boss be happy to see you go to a remote site and do intensive modeling? Well, part of the answer to that is, how many hours do they lose you studying for a big exam today? And can we convince them that it's legitimate to take those hours and use them to attend an intensive seminar?

Another issue around Course 7 is, what about the actuarial students in the 29 countries outside of Canada and the United States? Are they going to be asked to fly to a North American city to take the seminar? Or will we have centers of mass, such as Taipei, where we can actually offer Course 7 in their local geographic area? We're starting to think about some options for people that legitimately just can't make it. And the British Institute has some options that we may also use. Here's another example of where we may obtain the education from the best source. For students outside of centers of mass, we may actually use the British Institute exam as an equivalent to the intensive seminar.

Course 8, Advanced Actuarial Practice, would be your specialty exam and you would choose one. One of the critical points is that we are going to try to avoid details of legislation and regulation that are time and nation specific. So we don't think, at this moment, that we want to focus on the details of the 1959 life insurance company taxation bill.

However, a countervailing force here is that, while the SOA might want to think of your Fellowship as a degree, there are many people that think of your Fellowship as a license. So we have some forces from the licensing bodies—the AAA, the CIA, and organizations like the NAIC and the Joint Board—saying to us, where are you going to get ERISA? Where are you going to get the tax legislation? We must come to grips with that. And that's still in the state of flux. I don't have a well-defined answer to that question today. The specialties, as proposed today, would be managed healthcare, group life and health, U.S. retirement systems, which would

include EA-2, Canadian Retirement Systems, individual, life and annuities, a finance specialty, and an investment specialty, and other specialty areas. At one time we had a manufacturing specialty area. And what we meant was a specialty where an actuary would work for a manufacturer. When people read that, they thought we meant product design and pricing of insurance products. Well that isn't what we meant.

Other specialty areas could be just about anything and, of course, we can add them. And again, we might look to another source. If the Chartered Financial Analyst (CFA) exams are really good, maybe passing the CFA exams would give you your Course 8 finance credit or your Course 8 investment credit. And we would also see a property/casualty specialty, organized and sponsored and examined by the CAS, fitting very nicely into Course 8.

PROFESSIONAL DEVELOPMENT

Now that would be the end of the examination requirements for Fellowship, but that is not the end of the requirements for Fellowship. We also have a professional development requirement and this is where we would like to cover the nation-specific and time-specific material. Now this is probably the least well-defined area of the design, because it's the most recent. But we're working on it and we do have some ideas. How many hours of professional development would be required? Professional development would be satisfied by attending seminars, colloquiums, meetings, and university courses. We're talking about 50 hours of professional development to satisfy this requirement. Half of those would have to be hours accepted by the SOA, such as the sessions at meetings. Most of the sessions at a CIA meeting would be SOA-approved hours.

One of the things we're talking about is, should it be track specific? Or how many hours should be track specific? I think the board task force would like to remain flexible here, but again, if we have licensing requirements, the licensing people might want to see some track specificity, and one of the possibilities here is that the licensing bodies could impose requirements that would mesh with the professional development requirements. So they would say, within your 50 hours, we're going to require you to have so many hours on individual insurance, U.S., or so many hours on Canadian pensions. And we would encourage that and allow for that, but we would like to see that be done within the 50 hours, as opposed to on top of them.

You would be asked to find an advisor and, again, this is partly to make sure you do the right thing in a sense, but also to encourage communication. You're going to report to an advisor about your plan and, hopefully, you would report back to your advisor as you progressed through your professional development. I went to a

couple of sessions on managed healthcare, and learned that the advisor would not have the ability to say you failed. You would actually file a plan with your advisor and, ultimately, you would have to file what you have done with the SOA. The professional development requirement can only be satisfied with hours that are no more than two years old, but you can start your professional development while you're finishing your Fellowship exams, so there's a little bit of a gamble about when you are going to finish the last exam because you can't apply for Fellowship with any professional development hours that are more than two years old. And, of course, you can't apply for Fellowship until you've finished all of the eight courses.

But it certainly could be possible if you're successful and can predict your success, that you could finish Course 8, hand in your 50 hours of Professional Development, all documented, all filled out and then go to your Fellowship Admissions Course, and be a Fellow of the SOA. There will still be a Fellowship Admissions Course.

TRANSITION

For those who are now in the program, you're probably interested in transition. Well, we've again started with principles of transition. We are not going to offer two syllabuses simultaneously ever. We will end the old one and start the new one. However, there will be a transition period of at least three sittings, so that you will know the details of the new design and the transition credits, and still have three sittings left. Just as an example, but not to overemphasize it, if Course 6 is deemed to be mapped out of the old Course 220 and Course 230, and you need to have them both to get Course 6, and you have Course 220, but not Course 230, you might think it would be a good idea to get Course 230. Well, you'll have three sittings. Now, that doesn't mean three years because during that transition, we'll probably offer every exam, every six months. Then we can get through the transition in 18–24 months.

We're not looking for this to happen in the year 2037. We're actually hoping for 1999. Anything that can be mapped will be mapped. So if you have Course 220 and Course 230, you're likely to get credit for new Course 6. If you have loss distributions, credibility theory, and risk theory, you're likely to get credit for new Course 4.

Whatever is left over will turn into unassigned credit points. So if I mapped what I could map and I've got 40 credit points left over, what do I do with them? Some of those credit points could be used to buy the equivalent of Course 1 or Course 2 or to buy some of your professional development requirements. We think we're going to have an option within professional development that sitting another exam could give you 50% of a professional development credit. So if you wanted to go back and sit a second Course 8, at the moment, the proposal is that that would be worth

50% of the professional development requirements, so that would be worth 25 hours of which 12.5 would be SOA-approved hours. So these are the types of things that we're talking about that are still flexible and that we need feedback on.

TIMETABLE

So what is the timetable? Well that depends a lot on how we get along with you people. To this point, we've been fairly successful. We met with about 95% acceptance rates on the principles of redesign. People are saying they think we're doing the right thing and that this really is a good proposal for the actuary of the next century, but the devil's in the details. And now we're getting into the details. People are starting to say, "You know those guys don't have to learn operations research. I had to learn it." And, "Why are we leaving out the 1959 tax act? It's one of my all-time favorite tax acts, personally." So we have to get more feedback, and you will be receiving the document in August 1996, which is very similar to what we just presented to you. You'll be asked for feedback. If things go relatively smoothly, we will be presenting this to the SOA Board of Governors at the annual meeting in October 1996 for approval in principle. In other words, we're going to add another ratchet up. The Board of Governors has agreed to some of the material that Jeffrey has presented. So they've agreed to the principles. Now we're going to give them the outline of the syllabus, and we're going to ask them to agree to the outline in October, depending on your feedback. At that point, board involvement will decrease a fair bit, and it will be up to subcommittees to start to figure out what textbook we're going to use and what pages and what the page count will be and how many hours it will be. And the Board, in essence, doesn't need to get into approving that level of detail. When there are principles that involve things like licensing, the board will come back in. But the important approval point then, we hope, will be at the October 1996 annual meeting in Orlando. So you need to get feedback to us and there will be a deadline on the piece that's mailed out. You're going to have about four weeks to read the document, think about it, ruminate on it, write in your comments, and get them back to us.

If we get approval in principle on this design from the Board of Governors in October, then away we go! We will start to design the syllabus. We will work out the details of the transition credits. We will really dot the i's and cross the t's, and, again, we're still looking at that 1999 possible implementation. So it gives us 1997 to get the details out to the students and 1998 and 1999 to get three sittings in for the transition, and then boom, the guillotine comes down and we move to the new system.

Ms. Leslie F. Peters: As a general question, do you already have an idea of the format of the exams? The early series is currently multiple choice and the later part

is written answer. Will all of these exams be in more of a written answer type of format?

Mr. Allen: I think that's still to be decided, and it'll be decided as the subcommittees start looking more carefully at the subjects in each course and what detail they're covered on each course. There are a lot of advantages to having multiple choice exams as far as speed in grading and ease in administration. There are also advantages to written answer exams, especially at the core and Fellowship level. So that's something to be decided at a later time.

Mr. Brown: One thing that's obvious though, is that these exams are going to be big. Course 1 and Course 2 may only be three hours. The rest will be five- or even six-hour exams. Now there's an advantage to that, in the sense that it forces the student to read a number of topics and pull the material together and assimilate disparate material. And that's good. There's a disadvantage over the Future Exam Methods (FEM)/Flexible Education System (FES), in that there are people who now only have the time to write ten credits and can at least continue to ratchet up ten credits at a time. Obviously, you're going to have to write a big exam or not at all. One of the concerns that we have had in the past three years is at every sitting the average number of credit points attempted has gone down. The original thought was that people would still try to write 50 and 60 credit points in a sitting, but that has just not happened. So people are now nibbling away at the syllabus for 8 or 9 or 10 years, and one of our goals is to have a more compressed travel time.

Ms. Becky Kumar: My question concerns Course 8 and, in particular, the group health and managed care exams. Does the task force honestly believe that you can be a group health actuary and not study managed healthcare?

Mr. Allen: There would be managed care covered on that group life and health course as well. At the same time, on the managed care exam, there would be some coverage of the other group coverages. So there's overlap there. It's a matter of emphasis, really. The managed care course spends a lot more time on managed care, and the group life and health spends a lot more time on the other group coverages.

Ms. Becky Hutto Kumar: Well, that certainly sounds a lot better.

Mr. Brown: One of the driving forces here was a Canadian/U.S. split. Canada has a publicly sponsored health care system. Managed care is not a huge topic of importance today in Canada, but it certainly is in the United States. We didn't want to have U.S. health care and Canadian health care, but it has been split this way, and Jeff's quite right. There's going to be managed care.

Ms. Kumar: Yes, I can almost see the U.S./Canada split being cleaner than the managed care and nonmanaged groups.

Mr. Allen: This is also a very recent change in the design, and it was based on comments the design team has received. Originally, there was one course for group life and health, and the design team received many comments from actuaries working in managed care saying you're not going to cover managed care sufficiently in this course. The design team also received comments from actuaries working with disability income and individual health coverages saying these topics are going to be squeezed out by coverage of managed care topics. So we felt that this split will more adequately address these concerns.

Mr. Stephen M. Baloga: Do you plan on presenting each course every six months going forward? Or will it be just the first six exams?

Mr. Allen: That's another item for future consideration. We'd like to offer the exams frequently. I believe that the final result will probably be similar to the current structure, where especially at the lower levels, we can be assured that those exams would be offered every six months. For the later exams, it will depend, to a large extent, on the number of people taking those exams.

Ms. Audrey K. Comisky: I have two questions. First, many of us have more work experience than exams. I agree with the focus of this new design. Would it be possible to obtain exam credit for work experience? Second, it seems like Course 8 is the entire group track or individual track. We now have a 150 credits that will be reduced to 50. What type of mapping is going to be going on for that?

Mr. Brown: Well you won't get specific SOA credit for work experience. Your professional development would be, in a sense, viewed while you're working and enhancing your work experience, but it would still have to be a seminar, or a Harvard Business School course, or the Valuation Actuary Symposium, or something like that. This mapping for Course 8 excludes nation-specific, time-specific materials. So I would suggest that we're expecting that a lot of the Course 500 material will not be in Course 8, but move to professional development. So those 150 hours will be covered in the combination of a five- or six-hour Course 8 exam, and 50 hours of professional development.

Ms. Laura C. Hansen: I have a couple of questions. I took exam 210 and it seems that's primarily insurance related and I'm in the pension field. I couldn't care less about three-quarters of the exam. Why does the SOA keep emphasizing 200 and 210? Why do they see them as so important?

Mr. Brown: You may not be any happier in a sense, because the new syllabus won't have any specific life material and you might say, "Hurray," but it won't have any specific pension material and you'll say, "Boo!" What we're trying to do is present the core of actuarial work, which is risk assessment techniques and management of risk techniques. It's modeling that can be applied across the board. Whether it's a pension problem, a life problem, a municipal bond default rate problem, you need this core competency to work in any of those areas. Second, we want the actuary of the 21st century to be flexible. We hope that you will be able to move across divisions, because some day, if there's no defined-benefit pension plans, there may not be any defined-benefit pension plan actuaries. You may be doing something different, and we want you to be ready to move, because that is the reality of the 21st century. You'll probably look at the new Course 5, and say, "It's less specific to life insurance policies, but I don't see anything more specific about pension plans."

Ms. Hansen: So it's going to be more broad than, say, Course 210? It's going to be more business applicable because right now 210 is very specific.

Mr. Brown: Yes.

Ms. Hansen: Okay, that's fine. Do you have any idea of when the mapping is going to come? Right now we're taking exams and we don't know what to take.

Mr. Brown: Yes, I can tell you what to take. Take exactly what you would have taken under the old system. Pass as many credits as you can. That is the best thing you can do. There is no strategy that says you're going to wake up the morning you get your mapping and say, "Aw, I blew it. I made a mistake." There is not going to be that situation. I hope that nobody will ever write and tell me I was wrong.

Ms. Mary P. Kirby: I actually have two questions and one's a follow-up to Ms. Hansen's. When we hire entry-level students, they come in with two exams: usually 100 and 110. With this transition, what kind of advice should we give them as far as taking exams now? It's going to change, and they might not even attain Associateship by 1998 or 1999.

Mr. Brown: They will amass credit points that will be useful. If they have, say, nothing but Course 100 and Course 110, they will probably get credit for Course 1, and they will probably end up with some leftover credit points that can be used to buy professional development hours when they get to that stage. There won't be a two-year limit on that.

Ms. Kirby: Should they focus on the required courses right now, as opposed to the electives?

Mr. Brown: No, I think that their strategy should be the same tomorrow morning as it was yesterday morning.

Ms. Kirby: My other question is in regard to the professional development. You spoke about an advisor. Where would that advisor come from?

Mr. Brown: It would probably be your supervising actuary.

Ms. Kirby: And would he or she have to be a Fellow?

Mr. Brown: No. We would probably prefer that he or she were a Fellow, but there are people in situations that wouldn't be able to comply. Right now, if you tell me you want to become a member of the American Academy, do you not have to have a member of the American Academy sign something? It's not much different than that.

Mr. Watson: I just wanted to hear the statement again. For people who have passed exams, or parts of exams, when we do the transition, those exams that are not mapped into one of the courses can be used for professional development points without a time limit?

Mr. Brown: Yes.

Mr. M. Floyd Watson: The two-year limit doesn't apply to that?

Mr. Brown: No.

From the Floor: One of the things that we actuaries all use that has never really been tested on exams is computer skills. Looking at this new proposed syllabus, there seems to be a move in that direction, with emphasis on modeling. Has integrating computer knowledge been considered for some of these new exams?

Mr. Brown: Well certainly Course 7 will be hands on. You'll be on a computer. Let me go further on Course 7. You'll remember earlier in my presentation, I said there was the issue of how much time we can expect people to be able to find to come to an intensive seminar. We'd like to have a five-day seminar. Some of the feedback is, that's unrealistic. If it's unrealistic, and we have to move to a three-day seminar, then we may send out the dataset for Course 7 and some background material on a CD-ROM, and attendees would have to acquaint themselves with the

principles of the seminar and to arrive ready-to-go, which would be the equivalent of the first day in the five-day seminar. So, a lot of this stuff is going to be computer oriented. The Course 4 modeling exam will automatically assume a high-powered computer, and you'll be doing modeling techniques that are only feasible using a computer. We won't be using a French spline or a third difference formula.

Ms. Shanna L. Riffe: I have a question concerning the professional development hours. It seems to me that by sitting in on an hour-and-a-half of a course here, I get about 3% of the knowledge I would get taking a test on that subject. Has that been thought about at all?

Mr. Brown: There's a lot of continuing discussion on what is the right number of hours. Fifty is where we are today. I would say that the pressure, if there is any, is to move it up, not to move it down. In particular, some of the licensing bodies who want to force their requirements into that slot are telling us that maybe 50 isn't enough. So we're taking that into consideration and 50 hours might change.

Ms. Riffe: Fifty hours seems like a lot to accumulate over a two-year period. It just seems like the learning process wouldn't be as strong.

Mr. Brown: Remember that 25 of those hours can be relatively flexible. Some of them could be self-study or you could be going to a course at your local university. You don't have to go to the Colorado Springs meeting to satisfy those 50 hours.

Ms. Riffe: How does this transition under the old ASA requirements? Could you get credit through Part 4?

Mr. Brown: Yes, that would be fairly close, plus you might have some credit points left over to buy something else.

Ms. Riffe: So you would have more than that?

Mr. Brown: Yes, I think if you had the old ASA, you would probably get the first four and still have a few credit points left over.

Mr. Allen: I'd like to go back to your first question on the professional development requirements and what type of sessions you would take. There has also been significant discussion on what level of validation is required to receive credit for a session. Is it credit for a session where just attendance is required? Would that be a sufficient level of rigor to get credit for those courses? The task force is looking into alternatives to verify that you've learned something in that session.

Mr. Jeffrey A. Groves: I'm a pension actuary, and I'm curious about why the retirement system is split between the U.S. and Canada. It seems to be the one that stands out as being contrary to the principles of nation specificity, and time specificity. I can't speak for the CIA, but I think the enrollment exams could certainly be professional development, EA-2 in particular. I don't know how EA-1 A or B fits into the new syllabus.

Mr. Brown: The EA-1 will fit in Courses 3 or 4 somewhere. The reason for the split here is, in fact, the joint board and EA-2. Canadians don't have to have EA-2 to operate in Canada, and we practice differently in Canada than the Joint Board requires under ERISA. That was the reason for the division. So the Canadians would target more of the Canadian requirements, and a U.S. pension actuary would be able to satisfy EA-2.

Mr. Allen: I think to some extent that question is still unresolved. I think there's still a lot of discussion over proper treatment of the EA exams, especially at the Course 8 level. So I think we're continuing to work through that.

Mr. Brown: Let me go through the discussion. Here are the forces that we were faced with. I think the board task force would have liked to have had a Course 8 on retirement systems that didn't have nation-specific material and that just dealt with the principles of retirement income security. There would be funding and there would be contribution levels and vesting principles and all of that good stuff. It would be worldwide, in applicability. You write that exam and then you come along and say, "Yes, but, and I have to do EA-2. I mean why are you doing this to me?"

From the Floor: Well, you have 25 hours of professional development to stick the EA-2 into.

Mr. Brown: If we get feedback from the U.S. pension actuaries that they're happy with that, we would love that. I will stand here right now and say, the board task force would really be pleased if we could adopt that model. Thanks for the feedback. If other U.S. pension actuaries feel that way, I'd love to know that.

From the Floor: Currently, there is some expectation, and it has been discussed, that when you reach the level of FSA, you're qualified to supervise and manage people. Has thought been given to incorporating management skill and techniques into this new syllabus?

Mr. Brown: We believe that you have been allowed room in your professional development requirements to seek out the special roles that will suit you. If you

want to enhance your management capabilities, you can do that within the hours of professional development that are open to you. In fact, we would encourage that.

Ms. Lisa M. Fellen: My question pertains to Course 8. Are you designing that such that the types of specialties will have sort of an equal weight in comparison to each other? You had given the example of the investment track, and you might earn that through passing the CFA exams. Currently, the CFA exams take a minimum of three years. So I was wondering if you're targeting those requirements to have equal weight among them, or are they going to be different?

Mr. Brown: We're targeting equivalency to the extent that it's possible. We're going to try to be as equally weighted as we can. That's a goal.

Ms. Comisky: Rob, you had said that if somebody was already an ASA, they would go in there with having up to Course 4. So that means unless someone had passed all the 200-level exams, and they were currently an ASA, they could lose their ASA?

Mr. Brown: Nobody is going to lose their ASA. If you're an ASA, you're going to remain an ASA unless you're subject to discipline. If you have the new ASA, it would give you credit up through the first six courses.

Ms. Comisky: That would be equivalent to the ASA under the new proposal?

Mr. Brown: Correct.

Ms. Comisky: I know many people who are career ASA's, and I'm just wondering if they're going to have to go back and take the 200 level exams.

Mr. Brown: No, if you have your ASA, you don't have to buy locks for your door.

Mr. Todd C. Herman: As you mentioned, the average number of credits being taken keeps going down. At the same time, companies are giving less study time. These exams will now be five- and six-hour exams, so have you talked to the employers about whether they are willing to give more study time?

Mr. Brown: Well, there's a multifaceted answer to that. One of the points here is that one of the reasons that the number of credit points keeps going down is because the competition is trying fewer credit points, and you can't afford to write 50 if they're writing 10. Now, everybody's going to be writing a five-hour exam, and I suppose in a competitive world, if your colleagues get more study time and pass, and you don't get study time and fail, then your employer is going to have to reevaluate its program. We've had some feedback from employers on both sides of

this issue. Some say, we've enjoyed having students that only have to write 10 and 20 exam credits at a time, because we can work them harder and it gives them more flexibility. In particular, we're very sensitive to the fact that there are people with family needs that will find the new syllabus more difficult. We're very sensitive to that. On the other hand, some people welcome going back to a bigger exam process, and after eight finite steps, will be done. You might be done by the time you're 27 years old instead of getting your Fellowship at the same time you go to your grandchildren's convocation. So there are two sides to this model. We think this is the right way to go, and I would suggest that your study time will be a free-market response.

Ms. Peters: I'd like you to clarify your prior statement about the competition only taking 10 credits and you're taking 50 credits. I thought the whole point was that you're not competing against other people. You're competing against an unbiased, nonjudgmental pass mark.

Mr. Brown: I don't think that's inconsistent. If somebody spends 500 hours studying for a 10 credit exam, with a consistent pass mark, they're going to pass. And if you've got 50 credits and five topics, you're going to have more difficulty coming into the exam as well prepared as they are.

Ms. Peters: Along the lines of the study time and the differences between employers, let's say I'm working at a consulting company and I've previously worked at a large insurer. The study programs of a large insurer and the study programs of a consulting company are very different. If you haven't already, I would encourage you to talk to both types of employers.

Mr. Brown: Now we're including everybody. At the university where I work, I tell my students to go to a large insurance company and get their Fellowship and then go to the consulting house.

Ms. Marcie Smith Gunnell: I came in at the tail end, so I don't know if this was addressed or not. I just got my ASA under the old program. Would you recommend that I concentrate on the core courses to get the material required for the new ASA now, rather than skip to the Fellowship exams? I wanted to skip some of the Fellowship exams, because that's what I've been working in. Would I be better off, if I don't see myself getting my FSA in the next three to four years, concentrating on the core courses?

Mr. Brown: We're going to try to design the transition so that there is no winning strategy and no losing strategy. I've been telling everybody who asked me that question that there is no reason to sit down and strategize. Do what you would

have done and you won't regret it. You're better to pass some 400 and 500 series exams, than to attempt 200 and fail it, that's for sure. The one area where I might be careful, and you're going to have at least three sittings to take care of this, is if you have half of that 200 combination. It's going to be nice to have the other half. So if you have got a leg up, like you could put 200 and 210 together, that might be the new Course 5. You put 220 and 230 together, that might be the new Course 6. If you have half of that leg up, I think it would be advantageous to get the other half.

Mr David G. Hanson: There are those of us who have been toiling along for quite a while in the upper exams. In my case, I have 100 credits worth of the 200 courses, but I do not have Course 230 because I passed other core courses before 230 existed. That, I assume, will also come through and turn into Courses 5 and 6 under the new system?

Mr. Brown: This is a student who passed the 200 series prior to Course 230. We haven't gotten to that level. Somebody's going to have to figure out all these possible combinations.

Mr. Hanson: The other concern that I have is on Course 7. Modeling has been fairly weak in the current system, and I can see people coming in who have not had the modeling emphasis that the new Course 4 will have going into the intensive modeling seminar without sufficient background. That looks a little scary, in my case at least.

Mr. Brown: That's a good point, and we're going to have to think about that.

Mr. Gary A. Gorrell: I have two questions, one is about the intensive seminar. If you've already taken Course 152, will that apply towards the seminar? That was a five-day seminar. Or is that just going to go into your professional development credits?

Mr. Brown: We haven't gotten to that level of specificity yet. Again, in my mind, I see a high correlation there. Because of some of the previous comments, I think Course 7 is going to be one that will have to be flexible in the transition, so if you put those two statements together, you might want to be optimistic, but there are no contractual guarantees.

Mr. Gorrell: I guess the other question would be again, back to this 200-level issue, what if you have Course 200 and not Course 210? Has there been any consideration to giving partial credit on Course 5, and then just letting you take three hours of the six-hour exam or whatever?

Mr. Brown: There has been much talk about partitioning during the transition. It's something that we really want to avoid. I believe, in my own mind, that it's going to be three sittings and the day's over. And if you have Course 200 and not Course 210, you're going to have to write all of the new Course 5, but you'll have 30 credit points from the Course 200 that you didn't get a specific mapping credit for to use to buy other credit.

Ms. Susan M. Reitz: In principle, Course 4 and Course 7 both sound like they have a great deal of value. I will probably get my FSA before the transition period is over. Is there any thought to letting FSAs take, say, Course 7?

Mr. Allen: The SOA currently has the policy that FSA's can go back and take courses now, and I would expect that that would probably continue. Of course, their performance wouldn't go into the setting of pass marks, but I think there's a good possibility FSA participation might be an option.

Mr. Brown: I think we're trying to design the syllabus, particularly for Course 8, with that sort of retraining in mind. I could see actuaries through their career writing Course 8 three or four times, as they change specialties. One of the points of professional conduct is that you're not supposed to operate where you're not qualified. So if you change from a pension actuary to a health actuary, you may come back and write Course 8 well into your career.

From the Floor: I'm not familiar with Course 152. How is it determined whether you pass or fail that course? Is there a test at the end of the seminar?

Mr. Brown: Why don't we get a student to tell us?

From the Floor: I will say get a lot of sleep before you go to Course 152. It's a strong exercise in sleep deprivation. Basically it's a week where you go in and you take an all-day class each day from 9 to 5. You get homework every night, which will keep you up until about two or three o'clock in the morning. In the evenings, you have time on the computer where you work in different teams. It helps you do the homework and also just to learn these modeling systems that are on the computer. There's a mini project at the end of the week, and you take a three-hour exam. It goes from Monday to Thursday. Thursday afternoon you get your final project, which you work on independently. In addition to getting on the computer to get all your answers for the final project, you also have to study for the three-hour exam the next day, so basically, Thursday night you're up all night. Friday morning you take the exam and Friday afternoon, you have to write your final report, which you have to write by five o'clock.

Ms. Linda H. Andreae: First, I really applaud this effort. I think it's great. I want to know how much you expect the travel time to decrease and what are you all going to do as far as public relations to get the existing Fellows to buy into this as a system that really will make better-rounded actuaries. You know, everybody thinks it was hardest when they passed.

Mr. Brown: Well, I have to tell you that, so far, we haven't been driven out of town anywhere we've gone and given this presentation. In the very early going, before we even sat down to finalize the principles, we were told that one principle had to be not to decrease the value of the Fellowship. Historically, I will suggest, even though the exams that I wrote were actually the toughest, the ratchet has only been one way. We just add. I can't remember ever seeing this syllabus get smaller or anything disappear. When we went to FEM and FES, we added. Everybody says, there's 55 possible exams that you can now write. I think you have to write about 23 or 24 to get your Fellowship. We want it all in the new Course 8 series. Well, it isn't going to happen.

We have some people voicing concerns that if they don't see a certain topic in the new syllabus, then that means we've decreased the value of the Fellowship. I don't think so. I think if we create actuaries who can add value in the business world, then we have increased the value of their Fellowship. If the next generation of actuaries are seen as "the professionals to assess risk," then by implication and spinoff, you will be more valuable, and your Fellowship will be more valuable.

Ms. Andreae: What about the travel time?

Mr. Brown: I think the travel time is going to go down and that the average age of attainment of Fellowship may not change very much because you're not going to be able to start as soon. So, in terms of competing with other professions, (and we do compete for bright people in colleges and universities to come into the actuarial profession), we're going to be able to tell them that if they do well in college and come out with two exams, which is fairly realistic, then they will have six more steps plus professional development before becoming a Fellow. Right now you can't see the horizon. The average age for attainment of Fellowship might not change all that drastically.

From the Floor: I've had my FSA for 15 years, and my feeling, both as a manager and as an FSA, is that the existing travel time and track size is too long. I see young people working on this year after year. I believe that the old structure was a better one and I'm happy that the SOA is going back to it. I feel that in terms of making study time available, companies have to acquire good people and do what they have to do.

From the Floor: What about a mapping for transition?

Mr. Brown: We're working on the mapping right now. Of course, there are two ways to map it. You can take what the syllabus says and say, well that corresponds to what now exists. Or you can take what now exists and try to find out where it ends up. Let me tell you something very important. When we started this process, the very first day that we met, the one thing we decided was we were not going to start with today's syllabus and fix it. We started with a blank page and we asked, "Starting with no preconceptions whatsoever, how would we design an education process for the actuary of the next century?" We started with an absolute blank slate. We didn't try to take today's syllabus and map it somewhere. We didn't try to do that at all. I'm actually quite pleased that we adopted that principle at the outset.

Mr. Watson: I've been an Associate for 15 years. This should have happened a long time ago. You guys have done a good job, and what I ask and beseech you is, don't let the rest of us corrupt it.

Mr. Robert J. Stokes: I would like also to fully endorse your effort here. But I would like to suggest also, down the road, that when you get into the area of selecting text, you're essentially going to have to rewrite everything to fully implement this in an integrated fashion. If you try to make do with existing materials, you're going to go back to where we were in the old days when we had large exams, where you received discreet coverage of subsets of materials. Then you'll get back to the days of the old five-star scores, where you got a passing score on the entire exam, but there was a subset of it on which you did not perform adequately.

Mr. Brown: Correct and that's an excellent point, and let me reinforce that. Let's take, for example, the modeling exam that I've called Course 4. That's loss distributions, credibility theory, and risk theory. We don't want it to be three distinct topics, and for sure we don't want three books. We want it to be one integrated topic that is actuarial modeling. It happens to have many of the facets that we now call loss distributions and credibility theory and risk theory, but we don't want three discreet, distinct topics. We want one. But we have a great deal of work to do. We have to create that entire syllabus almost from scratch, or we're going to degenerate back to that problem, and that's what we don't want. So thank you for that reinforcement.

From the Floor: I like the more general focus of the restructuring, but have you looked at the effect on the actual businesses where actuaries work? It seems to me that it's going to be a quicker step into an FSA. Right now, for example, you might

have 5 FSAs in an office and a couple of ASAs. In this structure, I don't see many people stopping at the ASA level. I see a bunch of FSAs and then the people trying to get there. The structure is going to change. Have they looked into that?

Mr. Brown: I guess a bold, honest answer is no, not in any detail. We've had some feedback from employers. I come at it a little differently, because in Canada, we really don't recognize anything except Fellows. You're either an actuary or you're not in Canada. We have 2,000 Fellows in Canada. The normal ratio between Canada and the United States is 10:1; that would mean that the United States on an equivalent basis would have 20,000 actuaries and it doesn't. I don't see any problem with employing bright, capable people. You may be doing some of the things as a future Fellow that today a career ASA happens to be doing. That, to me, shouldn't discount the value of the designation whatsoever.

From the Floor: No, I don't see a discounting; I see pay structure being affected. I just think that if we're going to be concentrating on business modeling, we better be looking at the business modeling of the actual profession. I see the pay structure just going crazy. In my office we have very few SOA members. But I can look at people and say, "These people can get there now." That's definitely going to affect the consulting world but I'm sure it's going to affect the insurance world also.

Mr. Brown: But also remember that your world as your oyster is right now in the life insurance industry and the employee benefits industry. We hope that in the future your world is expanded.

From the Floor: No, I'm not saying anything is wrong with it. I'm just saying that I think the SOA should be looking at the effect that it's going to have on the people who are working. I think it's going to have a huge effect on the pay structure.

Mr. James J. Murphy: First, as a past general chairperson of the Education and Examination Management Committee, I think this is a great effort. Having worked with the old system and worked with the development of FEM/FES and announcing it, I think we're starting to get where we always wanted to be. But there are some practical issues that I think you need to address that are very important in terms of implementation and are on the exam committee side. One of the problems we've always had is in the area of really testing what we're trying to educate, which is the kind of questions that are asked, and how they're graded. And I'm sure you all see the regurgitation questions; you know just what book or list the answers came out of. It seems a part of implementing this is going to be training the volunteers to create the kinds of questions that will test what you are trying to teach. That has always been very difficult in our volunteer system. I assume you're working on

that, but I urge you to stress that as this becomes more well defined; it's a critical part of making it really work.

Mr. Brown: Thanks Jim. You're right. I would suggest that we've moved a long way in the last three or four years in that regard. If you were to look at today's exams, they do not say, "Copy page 461 and reproduce it." We really do now have questions that are, in some sense, unstructured and open-ended. They're more difficult to grade. We've also moved to a lot of case study-type situations, which force you to pull together material from disparate parts of the reading. So there has been a lot of training. There has been a big move in that direction.

Mr Allen: It still depends, to some extent, on which course you're taking. Some courses tend to elicit more regurgitation than others. But we are striving to work in that direction, and I think with the new system the emphasis has to be increased even more.

Mr. Brown: It's essential.

From the Floor: I think my situation is in the minority, but I received a master's degree in actuarial science from Georgia State University, and for me and many others that was a very valuable introduction to the profession. I'm just wondering what type of feedback you received from universities with strong actuarial programs about being able to transition to this type of syllabus.

Mr. Brown: Well, the feedback we've been getting is that the strong actuarial programs may have a greater advantage than they do today. With this syllabus, somebody majoring in actuarial science, at a school like Georgia State, will probably be able to get four exams before they graduate from the university. There is a bigger advantage today to being an actuarial major. Some people have stated that as a problem or a danger of the new system. Others have looked at it and said, we think this is going to be the end result. That may mean that 20 years from now we might have 20 centers of excellence in actuarial science in the United States as opposed to a brochure that has 250 colleges and universities listed as being in the actuarial science business. They respond that maybe that's okay. We are very sensitive to the fact that a significant proportion of our colleagues and some of our very best actuaries have come from liberal arts colleges. We don't want to close any doors on that sort of a program, but I would suggest that the strong actuarial science majors may have more of an advantage under this system than under the old system.

Mr. Gerard W. Lynham: I have been an ASA for three years. I came to this career a little late in my working life. I work for a consulting firm now, and the last couple

of years I came to the conclusion that going after the FSA was not something that I was going to do. I just don't have the time. This new structure gives me some hope. I'm glad for that and I want to thank you and compliment you all on your efforts in this regard. However, I do have one question. For each of these exams, are you looking at basically a three- hour or five-hour exam?

Mr. Brown: Well, of course, right at the moment we're looking at Course 7 as being 3–5 days. Course 8, 5–6 hours and Course 1 and 2, probably 3 hours each. Courses 3 and 4 will probably be 5 hours, and Courses 5 and 6 will be 5–6 hours.

Mr. Lynham: I hear the rule of thumb is that the three-hour exam is about 300 hours of study. Does that mean we're looking at 500-600 hours of study to take that Course 5, six-hour exam?

Mr. Brown: Well, many of us in this room wrote five-hour exams, and my rule of thumb was sort of 300 hours of study and you passed. I think there's some upper bound to how much time the competition can spend and still keep some semblance of human existence. I think 300 hours is still going to probably be the criteria to pass an exam because that's sort of the human upper bound.

Mr. Lynham: Glad to hear that. One other point on the intensive seminar; you say it will be 3–5 days. Now you all heard the description earlier of Course 152. Will the expectation be that going through this intensive seminar, which everybody will have to pass, is that it's going to be essentially a sleep deprivation exercise? Because, quite frankly, I think those of us who are older, are going to have a lot less chance of getting through it. It should be structured so that it's am 8:00 a.m. to 9:00 a.m. exercise rather than a 9:00 am. to 3:00 a.m. exercise.

What I'd suggest is that perhaps there should be more preparation work done before the seminar by people, maybe with graded exercises or a preliminary test at the beginning of the session.

Mr. Brown: Well, one of the things that's happening, of course, is there's the feasibility of sending somebody a CD-ROM and knowing that they can boot it. You can now be assured of that but, until recently, there were so many standards that you couldn't count on. I think you'll probably receive the material well ahead of time, and the dataset will be there and you'll be told to familiarize yourself with it. You probably will have a couple of weeks to play around with it at home before you arrive at the lab. I don't know how much that would improve the five days of sleep deprivation, but maybe it'll give you an extra three hours of sleep.

I'm going to go back and report that we had positive response today. When I go to the board meeting, board members say we really had a positive forum and many people want to move forward with this new system.