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# 2003 VALUATION ACTUARY SYMPOSIUM

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## Session 42PD

### Optimizing the Valuation Process

**Moderator:** ROGER W. SMITH  
**Panelists:** KENNETH E. JOYCE  
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ROGER W. SMITH

*Summary: Panelists discuss prevailing business models (and the role of the home office) adopted by valuation departments to meet business needs. Potential business models include:*

- *Decentralized subsidiary model*
- *Centralized hub*
- *Outsourced to external vendor*
- *Hybrid.*

*At the conclusion, participants have a better appreciation of where their companies' valuation processes fit into the business model continuum and have some concrete ideas of the areas on which to focus improvement to most effectively move toward the "best-in-class" ideal.*

**MR. ROGER W. SMITH:** I'm with PolySystems Inc. in Chicago. Joining me today to talk about the topic is Ken Joyce, a consulting actuary with Milliman USA. He works out of the Seattle office, and he's spent a lot of time recently in international issues, mergers and acquisitions and financial reporting. Also joining me is Bob Lemke. He's also with PolySystems Inc. in Chicago. Bob is a vice president there and spends a lot of his time working with clients in implementing valuation systems and processes. He's gone through several projects that could be considered optimizing in nature.

I'd like to get started with a few comments on this whole topic of optimizing. I always like to set a framework for why we might be doing this. Some of the topics we've heard about repeatedly in the last couple of days have been a drive to quality in financial reporting and the greater emphasis that all of the publics that we communicate information to will be placing on quality. So the valuation process and the compilation and delivery of information are more important, it seems, every day and every quarter and perhaps every year. And if you begin to forget how

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important it is, I have some photographs of some corporate execs being led off in handcuffs to help remind you of just how important it is.

The drive to quality, though, will demand more resources and more thought devoted to the overall effort. At the same time, I think that almost every company has been engaged in some serious cost-cutting activities in the past several years. How many companies have been told by their senior managements to find some creative ways to increase their budget 50 percent for next year? Can I see a show of hands? I can't see a single one.

So the process and what we're doing and why we're doing it are clearly very important, and we're being driven to cut costs. What can we optimize during the process? Obviously it's a valuation process. It involves hardware. It involves software. It involves people. If I were here 15 years ago, probably the largest potential savings might have been in the hardware cost. I don't know how true that might be anymore. It seems that we are able to make use of less and less expensive hardware all the time. Software costs—I just have a feeling that those might even be less than what they were 15–20 years ago. The people cost, obviously, becomes one of the items that many companies have been focusing on.

I just want to offer a couple more comments on optimizing and how people go about it. In the work I have seen people doing, companies like to see a very controlled production quality process in place. This is the process that will be untouched by human hands, so that if some computer run finishes in the middle of the night, it feeds another one, which goes along. Everything runs and finishes so that financial reporting people can come in the next day and have wonderful results ready to review. That's the goal.

What we find frequently is, because of all the changes that we have to face, increased importance at the same time that the demands and the level of difficulty seem to be increasing all the time. I came out of a session just before this one on the draft standard of practice, and they were talking about stochastic processes and production timeframes, so it's clearly getting much more difficult. Keeping a process streamlined is probably a never-ending task. I would speculate we will all be adapting and changing and modifying probably about every year as we add new requirements or try to squeeze a few more hours or a few more dollars of cost out of the process.

One of the things that I've noticed as well is that maybe this continued work is a good thing. Occasionally I run into people—not actuaries, but others—who seem to have a problem with having too much knowledge or who express an idea that with the right kind of a process or a production sequence, you can replace knowledge with a process. Everything that we've been hearing, at least that I've been hearing, during the last few days disputes that tremendously. While you're streamlining and trying to get everything done with fewer and fewer people, we still have an obligation to keep the knowledge about the process at a very, very high level.

There's sometimes the tendency to think that we can do without that, and there would also be the tendency, I think, that as a process becomes completely automated, to lose track of what's really going on in the process. Then it becomes more difficult to adapt as we go forward. It's almost ironic—if you completely optimize and automate everything so that no one really has to look at any error condition or ever adapt it, generally you'll tend to forget an awful lot about what is going on there and some of the key ingredients and some of the key steps.

I'd like to shift from that and invite Ken up to start with his example. The speakers will go through a couple of case studies on some actual situations that they have set up and optimized.

**MR. KENNETH E. JOYCE:** As Roger mentioned, I'll talk about a case study involving an external vendor's model with an international subsidiary. The objectives for today are that you walk away knowing a little bit more about this type of model and process designed for an international subsidiary and that you also gain some insights into the critical issues in using such a model, from both the perspective of the home office and the subsidiary. And finally, I hope we can talk a little bit more and appreciate the evolving nature of the valuation process in light of Sarbanes-Oxley. I think there's quite a bit to be said there, and, as you've seen in other sessions, there's a lot to be done.

I'll give you a broad overview of a case study. This is real work that we've done, but I've scaled it down to make it a little bit more generic for a presentation. We'll talk about some of the pros and cons of implementing this system and maintaining it. And we'll talk about the impact of Sarbanes-Oxley on the valuation process and the role of the actuary.

This is a model used for an overseas subsidiary of a U.S. corporation. It's a model; it's not seriatim. It uses actuarial software. It encompasses both purchase GAAP blocks and historical GAAP blocks of business, and the products are mainly traditional types that are classified under Financial Accounting Standard (FAS) 60, limited pay FAS 97, and FAS 97 unfunded liability.

Chart 1 gives you a conceptual picture of what I'm talking about. You start by breaking it into four pieces. The top is an extract from the company, the valuation extract. The second piece deals with either SAS or some other type of program reporting language to model and building the in-force files that you use. You can go to the third section there. It breaks into two actuarial models for each block. It's where we do all the calculations of reserves and deferred acquisition cost (DAC), etc. The bottom part is where we roll all the information up, using mainly Excel, and work with the companies to do the reserve summaries, any of your journal entries and analytic-type trend analysis.

Let's start with the first piece, the company's in-force data. This is coming from the valuation system. On average we're looking at about 10 million policy records. As I

mentioned earlier, these include traditional-type products, such as endowment, whole life, and deferred and immediate annuities. There is A&H business that's also included, as well as term. We have interest-sensitive products as well—some variable annuities, but they're not as significant at this time.

Next I'll talk about the model-building process. I think this could be a session just in itself, but for today I've tried to limit it to seven points, basically starting with the preprocessing of the data. I like SAS, so I'm biased, but there are many languages, or software programs, out there that you can use. We basically go through and do a lot of data mining, eliminating records that really don't belong in that quarter's valuation because of timing differences or when we get the extract. We do typical checks on date fields and consistency checks. We eliminate the policy number and do some remapping on other data to shrink the seriatim records, but we try to do it in such a way that we keep the preciseness of the model cells going forward.

This fifth point deals with a lot of the modeling to create the extracts for each of the actuarial models. The purchase GAAP block, as you know, is a closed block of business at the date of purchase. We design that in such a way that we are able to track the business that's coming in and make sure there are no new entrants. The historical GAAP block, on the other hand, is an evolving block, and it's growing. You have new sales; you have new products. You have many different situations that can occur. So you have to develop a robust model that can handle those situations.

The next item includes typical management reports that we use to analyze the raw data to show consistency. We want to look at all different splits of the business, whether plans and riders, status codes, insurance periods, etc. We do analysis not only in the current quarter, but we also try to look back at past quarters to see if there's a trend just in the raw data to give us some idea on how that may impact us in our models.

Finally, the last point is very important—reconciling back to the company controls. We receive the extracts—we receive many extracts, as you may imagine—and we always have to be able to get back to the company controls to make sure that we're consistent.

I want to say a little bit about the purchase GAAP model itself. We're talking about a model that is anywhere from 200,000 to 400,000 model cell points. This is not a very small model; it's very robust. And we're doing that to make sure that we can tie in the accuracy of the insurance cash flows with the model and that each quarter we're in sync. The model characteristics are tied to monthly and quarterly issues, depending on the products. The issue ages could be quinquennial or decennial, again, depending on the product and materiality. U.S. GAAP types will be classified accordingly.

And the last point is for the purchase GAAP block. We do a lot of analysis comparing, from the first purchase date, the block of business that we have to

future evaluations to make sure that there's no new business coming into this block. So we have to do comparisons and freeze those cell keys, you may call it, so the purchase GAAP block is consistent all the way through. By the way, that is an awful lot of work in itself.

Jumping over to the HGAAP model, we draw on some of the same modeling techniques we use for the purchase GAAP. We try to use quinquennial issue ages most of the time. We also have the same insurance periods, premium periods, etc. We have to build in processes for the HGAAP to identify not only new issues in that quarter, but also new business that is in past quarters. We may have something that's been in the pipeline for a while. It comes through during our current quarter, but if we've passed a calendar year, we possibly have a closed GAAP error or cohort. We have to make sure that we properly bucket that and create the GAAP factors accordingly. So the important item for those two points is that you have the tools in place to do that quickly in a production environment.

For the HGAAP model, we have to reconcile the model deferred expenses to actuals. We work closely with the home office and the subsidiary. We have to make sure the model can produce information at such a detailed level that it matches up to the actuals from the company. So again, it's important to have the tools in place to extract that information and circle back to true-up the model quickly. Finally, proper classification of the DAC, the U.S. GAAP type, for FAS 60, limited-pay FAS 97 and FAS 97 UL—we do all of those in the model.

Next, I'd like to talk about several important considerations, starting with consolidation of results, including statutory and U.S. GAAP reserves, DAC and value of business acquired. We get all of that information out of the actuarial models for the model business. We also have nonmodel business that we've identified as well that we bring into this summary.

The second and third issues are incredibly important. The key control that we use is the company's statutory reserve. We have set up the analysis so that all pieces of business are being recognized. Even though we have summarized that down to model cell points, we have to account for every piece of business. So we have either actual statutory reserve from the company if we're not modeling it, or we have our modeled reserves. Then we can compare back to this total number and force out an unexplained. The unexplained bucket must be small. If it's large, you obviously have a problem, and we look to make that as close to zero as possible. We do a tremendous amount of trend analysis on that to make sure that it's stable and thus the model is stable.

Next, I'd like to talk about the analytics and general entries that every company has to do. We have currently done it at the consulting firm, but it's done at the subsidiary level as well. Roll-forward analyses by detailed product splits—again, we work closely with the home office to identify these splits, producing expected roll-forwards and layering in actual information as well. The same is true for the source

of earnings. I can honestly say, though, that it is very difficult and takes quite a bit of work. The last part is the financial analytics that everybody's familiar with. We do a lot of trend analysis on the reserves on these different splits to see if things remain consistent from period to period.

That's a summary, a broad overview of the process that we have been using. What I'd like to do now is to move into some pros and cons, or benefits and challenges, as I like to call it. Just starting out, I have a compact valuation model that correlates closely with the company's statutory reserves and premiums. I call it compact, but 200,000–400,000 model cells is a large model. However, if the model's built correctly, and we have the right checks and balances in place, and we have a very close correlation to the company's actual reserves and premiums that we can trend from period to period, it's a very stable model. The model allows you easy transition to support strategic business plans. You have the robust information and calculations. You can quickly project that information over whatever horizon you want. The third item allows you to do more corporate work. If you want to shrink the model further or do some embedded value, cash-flow testing or whatever you may want to try to do, again, you have a basis from which to work, and it's easily transitioned.

Let's talk about some of the challenges. There are some significant challenges in a model of this nature. One is that the development and processing are detached from the subsidiary and the home office. While developing the model, you work closely together. But as you know, quite a bit goes into building complex models, and you can't always transition that knowledge easily. Also, when working internationally, there's a language barrier at times. You may understand the product or believe you understand it, but when the staff finally takes a closer look at what you've developed, they may see some other practice or actual differences that you didn't capture. So you need to stay on top of that.

The increased level of communication required to transition knowledge of interworkings of the system—the intent here is not to run this model outside of the company. The intent is to transition this model to the company so they can do it. That is a huge task. It's doable, but it requires a tremendous amount of resources and commitment from everybody. There's just a tremendous amount that goes into building the models or any system, and you have to have those dedicated resources working with it daily to get up to speed quickly.

Finally, we have model noise. This is a reality when using a model versus seriatim. You need to track it. You need to understand it. That's why we've developed model fit reports and other trend analysis that we look at quarterly. We compare it back each period. If you start to see model drift, you need to drill down quickly into this model, isolate the actual business and discuss it with the company. You need those tools in place, especially in a production environment.

That covers most of the case study. Now what I want to talk about are some key issues to think about. I have five questions and some of my thoughts on ways to address them. Hopefully this will stimulate some conversation and get your thoughts on them. The first one is, What key indicators do you use to help anticipate potential earnings impacts on quarterly results? I have three. The first is process changes that may impact the flow of data. Given the fact that we're using an external model, our processes have to be well documented. Even though we think we may document them very well, the intensity of that has increased with Sarbanes-Oxley. We need to understand from the company side whether there have been any changes in their processes, such as developing the valuation programs, that could impact the data. Have there been changes to the policyholder system for information that might change the classification of a record from limited pay to full pay under FAS 60? Could there just be general changes or corrections of data? How do we know that, and how can we anticipate the impact on the model? The answer is good documentation, but that's easier said than done.

The second item involves claims and surrender activity during the quarter. Are there some early or interim reports that you can draw on during the quarter to help anticipate the flow or pattern that may occur at the end? I can give you an example from when I worked at an insurance company that involves disability income. I managed that closed block of business, and, as you know, disability income is very volatile. I ended up working very closely with the claims department to determine how many first notices came in the door daily. What was the activity of closed claims? What settlement activity occurred? That gave me a better picture of how that business fluctuated compared with my plan.

The last item is seasonality and volume of new sales, along with the in-force business. Are there some special sales programs, conversions or renewals that go on, and how can you anticipate what that may do to the results of the model? Are there other fluctuations or bunches of maturities for certain products? Are there some early maturities that are allowed in the company? How can you know that, and again, what's the impact on the model from that?

The second question deals with what procedures and controls do you follow each quarter to ensure that results are accurate? This talk is focused on processes and controls as opposed to run times, but I can't stress enough how important it is that our processes and controls are solid, and this is a group effort. This requires the home office, the subsidiary and the vendor to work together almost daily during this period to get these processes in place because what you may think is a good process may not be what the home office or the subsidiary uses. Differences may come up.

We touched on some of the documentation. But even when we look at the programs that we use to assemble the information, such as Excel spreadsheets, other valuation programs or other modeling programs, how well are you documenting those? How well do you know which complex logic is in there, and

what's the impact if nobody's checked it in a while? What embedded assumptions are in these programs that may not have been looked at in a while, and how do they relate to today?

As for the reconciliations to administrative data sources, here again, you receive three, four, five or six different valuation extracts for a quarter, depending on the system that the company develops it from. How well are those reconciled to each other and back to the administrative systems? What checks and balances have been instituted at the company level to ensure that? Again, with our reliance on using actual statutory reserves as a control, we need to make sure that we understand any inconsistencies.

I touched on the model fit earlier; it is critical for this case study. We have designed model fit reports that are not only split by plan and rider, but you're also able to drill down into those by eight different characteristics of the business, whether that's premium owed, insurance period, premium period or what have you. We have the ability to do that and trend that from period to period. Again, the idea is to determine if there is an underlying drift occurring in the business as you go forward with the valuation.

Finally, I want to touch on comparisons of actual and expected roll-forward results. We produced the roll-forward expected results out of the model, and we then linked back with the company to actual data. So the actual and expected splits of the business need to be in sync, and lining up this part is very challenging. My panelists may have some comments on that as well, but I know we have found it challenging but quite important.

The third item here is what role do you play in communicating results to the chief financial officer (CFO)? It's my opinion that our role has increased as actuaries, and that's good. But how well do we communicate with the CFO, and how well do they understand the processes that we use to develop these results? The reserves are a big part of the balance sheet, and I think in this area we can play a critical role. I've listed potential problems that may impact earnings—source of earnings, analysis/trends, comparisons to business plan and variance analysis.

Let me share a quick story with you. When I had the opportunity—although I didn't think it was an opportunity at the time—to manage a disability line, I learned very quickly how badly I was communicating with the CFO. The CFO let me know that very quickly. The process we went through, although it was agonizing for me, was probably one of the best experiences I've ever had because, in effect, I learned how to communicate the results of a complex product to a CFO in plain English. I had been speaking actuarial language, and that was not working. I eventually learned, through working with the CFO and the staff, how to present the material, how to outline the processes that we were using and how to communicate what I thought the gray areas were. It became important during the quarter that I was able to get a better feel for how things were materializing.



I think the same applies today in other businesses, in your business, as you may well know and be able to talk about. In my experience I've worked a lot in comparing back to the business plan, developing a robust business plan and being able to explain those variances. As you know, the valuation process can sometimes get bogged down in getting the information pulled together, leaving little time for the analysis. That's an area where, again, we have to optimize so that we have more time for the analysis, and we can outline these processes and controls better.

Given Sarbanes-Oxley, what has changed in your current valuation process? I'm hoping others can share with us their experiences, but in my experience over the last year we've seen tighter auditing scrutiny at all levels. This includes certainty of your results. How do you know they're certain? What independent checks have you instituted to make sure they are correct? What are your quality controls? Show me what those are, and explain them. What's your sign-off procedure? How do you pass on this information, and how are you peer reviewing it?

I've touched on the required transparency of processes, but I can't stress it enough. It's become even more important that everybody understands what's embedded in those processes. Audit committee updates on correction of errors and cumulative impact on earnings are a reality, and we have to be able to deal with them. If there are errors or corrections in the models, we have to be able to identify them quickly, quantify them and explain them.

The ultimate accountability of the CFO and CEO for accuracy of quarterly results is another reality, but it's intensified. As an actuary, I think this is a great opportunity for us, although it places a higher responsibility on us. I know we have seen quite a bit more of the reliances that are coming down, and I'm sure all of you, as chief actuaries, have to sign some form of a reliance. It's now a reality.

Finally, how do you feel about the chief actuary certifying quarterly financial statements? I was at the Actuarial Foundation clambake a month ago, and the topic was corporate governance. There was a Wall Street analyst there who raised this issue and asked the crowd about it. He said he would like to see the chief actuary speak to the board, explain the risks in the products since they're the expert and do this without the CEO or CFO in the room. I'm not sure that's a reality or will happen anytime soon, but it intrigued me, and I wanted to throw that out today as a discussion item.

The actuary obviously is a critical player in identifying risks and potential impacts on earnings, as well as integrating that role with all parts of the company. This isn't new. This is what we know. But I think we have an opportunity to step up and do more, to work more closely with our CFOs in communicating these results and assuring them that what we're producing is solid, that the results are good and the processes and controls are in place. That's my opinion, by the way, and not my firm's.

In summary, we've talked about using a valuation model that is external to the home office and subsidiary. It requires a tremendous effort from both the home office and subsidiary to work. We discussed communicating the results early to the CFO to help him or her anticipate swings in quarterly earnings. Finally, the valuation process is always evolving. Never stop questioning it, questioning what can go wrong. Question that in a healthy, skeptical way, but keep that in mind as you're working.

**MR. ROBERT J. LEMKE:** For my part of the presentation today, we'll review a valuation process that needs improvement. This will be a generic process for a sample company. This process will be applicable to most lines of business. We'll discuss the steps that can be taken to optimize the process. Our goal for this sample company is to reduce its 10-day valuation process to a three-day process. Then we'll review the new optimized process that we put together.

The process I'll describe is a seriatim valuation process run by the company. The basic data flow is that they create a valuation extract that feeds their valuation systems. The valuation extract is simply a file of valuation data extracted from the admin system. They run their valuations, create value extracts, and then run reports off these value extracts. Our sample company is in need of optimizing their process. They have some problems with their valuation extract. The data are incomplete, and you have inaccurate data. They generate a variety of extracts, and there's very little documentation regarding their valuation extracts.

On the second and third days of their valuation process they run their valuations. Numerous valuation runs are performed. They start the valuations manually. They'll run sequentially. This is time-consuming; that's why it takes two days. They have significant valuation errors; they often need to rerun their valuations. They use several valuation systems, and the methodologies vary. The varying methodologies cause additional work in analyzing results. It's also time-consuming to pull results together because they're using several systems.

Our sample company spends the next two days in their valuation process calculating reserves manually. Because they had so many valuation errors due to their standard runs, they need to estimate reserves for a variety of policies. They calculate reserves for riders and claims manually on worksheets. For the traditional life lines they calculate separate nondeduction reserves and risk-based capital reserves. All these are done by the members of the actuarial department, and they need to bring all these data together manually, combined with their standard runs.

On the next day, which is day 6 of their process, they begin to assemble reports. This is a manual process. They assemble results with the different valuation runs. They pull together numbers from the different worksheets they've created. Their report formats are rather inconsistent, so it's difficult to analyze the results. Reports evolved over time for this sample company, so they generate extraneous

reports that people don't even use. Many key management tools are missing, so it's difficult for them to analyze their results. The next day they begin to review their valuation results with management. They finally assemble their reports and go over them with management. At this time they may need to make some annual adjustments, rerun some valuations.

The next day of the process, our sample company summarizes results with the accounting department. They summarize these in a worksheet and then pass them to the accounting department. The accounting department manually enters the data into the accounting system. Then the accounting department prepares income statements and balance sheets and passes these summaries back to the actuarial department to review. The actuarial department will assist the accounting department with an explanation of the variances to the plan numbers. Since they're missing key management reports, this is a difficult process for the sample company. Finally on day 10, they provide senior management with the reports to review.

I'd like to spend some time talking about the steps that the sample company can take to optimize their valuation process. They should begin by documenting the current process so they understand all the steps involved, all the people involved, the hardware and software that are used. Then they'd have a thorough understanding of what's being done, and why it's taking them 10 days to complete their valuation process. After this is complete, they can move into identifying the inefficiencies in their process. This is a significant project to optimize the process, so we'll need to allocate resources. We'll need employees' time. We may need to purchase additional hardware and software.

We want to review and evaluate the current systems thoroughly. We want to ask such questions as, Are current systems meeting our needs? Do we need to purchase new systems? Do we need to build new systems? Can valuation runs be consolidated? Can systems be eliminated? For our sample company let's say, for example, that they have several traditional life lines and several universal life (UL) lines, and they have purchased blocks of business over time, acquired blocks, added new plans; and they may have several traditional life valuation systems and some UL valuation systems. They may have several extracts that have been created over time. We'd like to consolidate some of that, reduce the number of extracts, reduce the number of valuation runs and choose one valuation system for traditional life and perhaps one for UL. We'll also want to evaluate the run times. Is the reason that they take two days to complete their valuation just due to run times? Perhaps they need new software or hardware.

We'll want to thoroughly review the data extract process. As I mentioned earlier, at our sample company this was not well documented, so we want to take the time to create a data dictionary, a detailed description of every field in the valuation extract. It also contains documentation as to where the source data came from—the admin system in this case. As we're improving the data extract process, we

should try to produce consistent extracts among the various lines of business and among the various blocks. When possible, we should try to consolidate these extracts to reduce the number of required valuation runs. We also want to clean up as many data errors as possible.

We should then turn our attention to the valuation runs themselves. As I mentioned earlier, our sample company had quite a few valuation errors, and this in itself lengthened the process because they had to calculate reserves manually to make adjustments for these errors. If you have a factor-based system, we want to take the time to add the additional factors. For our first principles-based system we want to add the required coding to eliminate as many of these errors as possible. Perhaps some of the valuation errors were due to the data errors that were cleaned up in the prior step, so that should eliminate some of those. We'll then try to minimize or eliminate any manual reserve calculations that are being done.

Our goal here is to create an automated, streamlined valuation process. What we would like to do is have the valuation extracts generated automatically. As soon as those are done, the valuation programs can start running. As soon as those are complete, then the report programs will start running. Any manual steps will slow down our process, so if possible we want an automated process for every reserve calculation.

We're bound to have some valuation errors, so one thing we can do is incorporate default reserve processing. As long as we have an immaterial amount of errors, we can assign a default reserve. For example, on a UL or annuity product, we can simply assign a fund value as the reserve. For traditional life, we could have an average reserve per thousand based on a plan, and this could be part of the automated process.

So for our sample company we now have generated extracts that are clean, containing very few data errors. These are automatically fed into our valuation systems. We have very few errors. For the policies that did err, we've assigned default reserves. Now we need to focus on improving the reporting process, first by creating a list of all the reports that the company currently generates. Then we want to survey the users of these reports. I think we'll probably find that there are quite a few reports that are generated each month that aren't even used. We'll want to eliminate these unnecessary reports.

We should also try to streamline the reports. There may be unnecessary detail that clutters up the essential aspects of the report. We need to eliminate extraneous data. We should try to customize the reports for the users' needs. We may have a report that contains quite a bit of detail and find out that our users simply go to the last page to look at the summary lines. If that's the case, we'll want to just produce the summary results.

As we're interviewing the users of reports, we'll probably find that there are additional reports that they'd like to see, so we'll want to incorporate those into our process. We should try to keep the report format consistent between lines of business and between blocks for easy comparison. The key component here is that these reports are automatically generated. We really don't want to take the time each month to key numbers into Excel and modify reports. We want these to come right out of our process.

Our sample company was lacking management tools, so we want to incorporate such management tools as reserve trend reports, reserve roll-forwards and source of earnings reports. We'd also like these reports to be generated automatically from our process so they're readily available and we can explain deviations from plan. They can also be used as a quick check at the current level of reserve.

We then will want to document our new process. We probably would like to assemble some high-level flow charts to give to senior management but also detail-level documentation for auditors and for use within the department. As I mentioned, this process should be automated. Our goal is to have, on the first day of our valuation process, the extracts generated and the valuations run, followed by the reports, so that on the second day we can begin reviewing reports.

Because it's an automated process, we will need exception reports and error reports throughout the process. We'll need to know instantly if there were problems, so that if there was a significant number of errors, we can correct them and get the valuations restarted and rerun. We'll want checks, such as do the records in equal records out?

So our new optimized process for our sample company is that on the first day we'll create our valuation extracts. Then the valuations will be run. Exception and error reports are generated throughout the process. For our sample company, now we have very few errors. We've assigned default reserves for the few policies that do err, and we had a full set of reports automatically generated. On the second day of our optimized process, actuarial management can review the results. If any corrections or adjustments are needed, they can be done here. We may need to rerun some valuations. We might not have been able to automate every single reserve calculation completely, so we may need to do some manual calculations and incorporate those, but hopefully that will be minimal.

Then on the third day of our optimized process, our results will be automatically fed to the accounting system. The results will be automatically fed to a data warehouse, and then management reports can be generated automatically from these different sources. We'll have reports generated automatically from the accounting system, from the data warehouse and then from the valuation systems themselves. By feeding the results to a data warehouse, we have prior months' and prior years' reserves, so we'll automatically get reserve trend numbers, source of earnings numbers and numbers regarding reserves for multiple periods. This will

help us answer questions from senior management about variance of earnings from plan.

In conclusion, let's go back through the data flow of our optimized process. We start with building seriatim extracts by running extract programs that pull data from our admin system. These extracts will feed our valuation system. As the valuation system is run, it generates error reports. Then the valuation extracts will feed the data warehouse and our accounting system, and reports are run from the data warehouse, from the valuation extract and from the accounting system.

**MR. SMITH:** Clearly documentation is very important today and will be even more important in the years ahead. Would either one of you care to comment on the adequacy or the completeness of current documentation that you've seen in practice and what it will need to be in five years?

**MR. JOYCE:** Let me take a shot at that. I'll comment from both the consulting side and what I've seen in the companies. I think many times the documentation is done in a way that is specific to the person who is doing it, as opposed to moving to a more systematic approach or a better template that everybody can follow so the documentation is more consistent. I see that in our own shop from our own staff when we're working on things, they just document in their own way. I think as we move forward in time, we have to use better templates, especially when you're working as an external vendor with a company subsidiary and a home office.

Chart 1

# Case Study

## Valuation Model Flow Chart

