

# RECORD OF SOCIETY OF ACTUARIES 1988 VOL. 14 NO. 4B

## PENSION ACTUARIAL ASSUMPTIONS

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Panelists: KATHRYN G. MARTICELLO  
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Recorder: A. RICHARD LABOMBARDE

- o Discussion of Pension Committee paper
- o New minimum funding assumptions
- o PBGC requirements effect on assumptions
- o FASB effect on choice of assumptions

MR. A. RICHARD LABOMBARDE: FASB is about ready to issue a document that would come up with an assumption basis that would be different from the assumption basis in FAS 87. In other words, I think any assumption is fair game, including noninterest rate assumptions. Our speakers will be concentrating on the ones that are of the most interest to us.

### Quote from the Conference Committee Report of ERISA

The conferees intend that under this provision (Sec. 412 Provision) a single set of actuarial assumptions would be required for all purposes.

Example: for the minimum funding standard reporting to the Department of Labor and to participants and beneficiaries, financial reporting to stock holders, etc.

I think we are far from that. I am not sure whether when they stated that intention they really understood where we would be today. Certainly it is to the point, where for virtually every different purpose that a plan could have you conceivably have a different set of assumptions. Referring to the upcoming paper produced by the Pension Committee of the SOA, as well as to a recent documentation from the Interim Actuarial Standards Board (IASB) on measuring pension obligations, one thing that I found a little bit confusing or a little bit surprising was that neither the IASB document nor the upcoming pension paper refer to the purpose of the assumptions, nor to any legislative guidelines, nor to any regulatory guidelines in the assumptions in selecting them. They are simply looking at the theoretical basis for the assumptions, whereas today for any of the assumptions that we do we all know that whether it be full funding, FAS 87, or whatever, that the purpose means a lot to the assumptions.

I anticipate our speakers may be getting into this. Ray Shaak is from Hewitt Associates. Perhaps Ray would like to explain how we can get back to the point that we used to know and love, where you set one set of assumptions and it's used for everything as the conferees intended. Or if that's not the case, exactly where he sees practice going these days with respect to setting assumptions. Kathy Marticello is from the IRS, and we anticipate that she will be able to explain to us what the IRS is going to respond to Ray when he sets his

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assumptions the way he sets them, as well as possibly give us a little bit of insight into the recent court decision on actuarial assumptions. I anticipate that we may be able to ask her some questions on what some of the issues are with respect to OBRA 1987.

As a last word of introduction I might also like to throw out a challenge. Perhaps Ray could explain to us why 8.5% would be deemed a reasonable assumption in some cases, and perhaps Kathy could explain to us why the IRS sees it as not being reasonable in particular instances. I am sure one or the other of them will explain to you exactly what I am referring to in pointing to the 8.5%.

**MR. RAY NED SHAAK:** One way that I look at method of selection of assumptions is to not use a black box, but to use a funnel. I think that one way to select assumptions is to build them from the ground up, build each assumption individually, put them together, put them in your funnel, let it work, and hold your hands out. When you get your numbers you pass them to the client and say "thank you very much." Another way is to take the number from the client and roll it out so you can jam it into the bottom of the funnel, and then you hold your hand out so that you can catch the assumptions as they come out the top. I think we have all seen that or heard of that in practice. It can be a difficult process to defend.

I think another method is to look at your funnel, and to look at the other guy's funnel and see how they are doing it. You can think of it as the herd mentality. I think a major importance in selecting actuarial assumptions is to consider plan sponsor objectives. For example, what are the funding objectives of the sponsor? Is he interested in funding accrued benefit values? Is he interested in funding an accumulated benefit obligation (ABO) measure or a vested benefit obligation (VBO) measure? Is he interested in funding a projected benefit obligation (PBO)? I think that where the sponsor wants to go in his funding may influence his selection of the actuarial assumptions. Another aspect is the cash flow needs. By cash flow needs I mean not only the cash flow needs of the employer or plan sponsor, but also of the plan itself in paying benefits. Obviously if you have a plan with a large group of retirees with high benefit payments you tend to think of that plan a little differently than a plan that is brand new and covers all young, active employees.

Another aspect is competitive standing, based on the herd mentality. What are other people in the industry doing? What are other companies of your same size doing? These can help you in gaining a sense of comfort with your actuarial assumptions. Several years ago when I was helping a client through implementing FASB 87, I went away with a charge to use these assumptions and see what we would come up with as expense. So, I did the number crunching and prepared a little report and chart of numbers and went back to the client with the pension income. I told him it was good news and I thought he would like it. The comptroller looked at it and said it worked out to about \$0.16 a share and that was about right. I asked what he meant. He said, "Well, Corporation X got \$0.18 per share so I think what you did is okay."

Obviously, the first place you want to start in choosing actuarial assumptions is regulatory guidance. What sort of rules do we have to follow? One of the major corporate raiders said that the most valuable people for him are lawyers and attorneys because they understand the rules of the game or the business that they are in. I think when we look at actuarial assumptions we see that there aren't a lot of rules. There is a very general sense of what the rules are. The

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rules are not specific. There are some corollaries with the rules. The most obvious example is the IRS audit guidelines and Worksheet 3. But I think what we find is that the selection of actuarial assumptions rests upon the judgement of the actuary. I have seen that most of the recent sessions dwell around laying out the rules -- what you can or can't do, or maybe point out some questions that have to be resolved pertaining to those rules. In this session I think what we have to do is use our judgement to a greater degree. It can very often be a gut feeling as to whether or not what you choose as your actuarial assumption is appropriate or is reasonable.

For regular funding assumptions the guidance is something along the line that the assumptions have to be individually reasonable or of an explicit nature. You can use assumptions that are what we think of as input in nature, as long as they produce the same contribution as a set of individually reasonable assumptions. For those of you that still use input assumptions, I think that you will have to prepare yourselves for the question from a client, "why are you doing two valuations to get the same number?" You can say, "well, I want to make sure that my set of assumptions are okay." They will say, "well why don't you just use this other set of assumptions that don't need that kind of test?" Obviously that is a hard question to answer. I think over the years we have seen most actuaries go from the implicit to the explicit approach. It is easier to defend and certainly easier to rationalize to the client.

The method of measuring the reasonableness of assumptions will be in the near future, or has been in the recent past anyway -- the IRS audit guidelines. With the move in the law to expressly requiring individually reasonable assumptions, I wonder whether the audit guidelines are still useful. Is the Worksheet 3 still appropriate, since it measures the reasonableness on an aggregate basis? I am not sure if that is an appropriate question, but that is a question for later.

Other guidance comes in the form of Revenue Ruling 63.11 which says more or less that reasonableness of actuarial assumptions should be evaluated over approximately a five-year period. For the current liability calculation which came about with COBRA 87, we use the same assumptions as regular funding with the exception of the interest rate. For this purpose we use an interest rate that ignores the plan provisions, ignores the plan assets and so forth, and focuses on a more market-type interest rate. I think the law sites that the choice of interest rates in this case should be consistent with the annuity purchase rates that are currently available. This probably means that you can choose different interest rates for different plans provided the demographics justify that. The most obvious example is the plan of all retirees versus a plan of all actives who have long deferral periods until they receive their benefits. The additional guidance in selecting this interest rate is that it must be within a certain range. That range is 90-110% of the weighted average return on 30-year treasury bonds. I think for plan years that started 1/1/88 that was about 8.25% to 10.07%.

Turning to FASB, I think here we had a whole new way of thinking about the selection of interest rates. Selection of other assumptions was pretty much unchanged -- retirement age, salary scale and turnover assumptions were consistent with the individually reasonable. That is one requirement of FASB 87. But, when it got to the interest rates I think you saw a whole new way of thinking about pension costs. There are now two interest rates as we all know, the first being the discount rate. The discount rate is applied to the plan liabilities only. The guidance that FASB 87 gives us is that it be consistent

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with annuity purchase rates, or the interest rate used in the annuity rates. It says that in helping to arrive at this interest rate we can consider fixed income investments -- high-grade fixed income investments. In theory I suppose this means we can consider anything from Treasury bonds to BBB corporate bonds. If we look at what that range means we see that we have quite a bit of flexibility. The long-term rate is the rate that is applied to the assets. In choosing that interest rate we are told that we should consider the plan assets. So we have two very different sets of criteria that we use to choose our interest rates. I doubt if any of that is really news to us.

Let's talk about some of the considerations in choosing our funding assumptions. The most important assumption is the interest rate. We can think of the interest rate as being of two, perhaps three pieces. One is the underlying rate of inflation and a real rate of return. A third piece we can think of is risk premium. That is, we can take a real rate of return and divide it into a riskless rate of return and risk premium. In considering the interest rate we ordinarily look at our plan assets, consider our different asset classes and see how the different classes interact, see what our mix is. We can think of a portfolio of a high percentage of stocks as being able to justify a higher interest rate than one which has a low percentage of stocks. Although in practice a portfolio of bonds usually finds itself with a higher interest assumption for that plan than a portfolio of stocks. One of the things that many actuaries do is look at recent history.

Now comes the second part of my coordination test. We all know that history is a good teacher; or, he who forgets history is condemned to repeat it. Many people would begin by looking at returns on types of investments. Imagine a graph showing some annual compounded rates of return for the Standard & Poor's 500 index over different periods of time, measured at different points in time, and along the bottom of the chart would be the year of determination. If we were choosing assumptions 1977, or if we were choosing assumptions 1987, we would come out with some different types of help. Looking at 1987 we would see that our stock index has performed quite well and is 15%. But looking at all the different rates we would see that it varies all across the board. Looking at long-term corporate bonds we would see less variability for 1977. In 1982 we would see a very similar pattern of bars. In 1987 we would see something quite different, and that is not surprising, given the economic environment over the last five years. However, if we were looking only at the 1987 bars, I think that based on no other information we would probably arrive at some fairly high interest assumptions. We all know that looking at total returns does not give us the total picture that we are interested in. When we think about choosing an interest assumption we identify the inflation rate first and then go about identifying real rate of return.

Taking the inflation rate out of our Standard & Poor's return helps us a lot and really levels out all the bars; well, maybe not. What we see is that now there is even more variability. So looking at history does not help us as much as we had hoped, perhaps. Certainly if we were doing this in 1977 there would be no hope. How could you possibly tell a client that with an assumption of 4% inflation it is reasonable to assume a negative return on the stock part of his portfolio? No, you can't do that. So, you set that aside and you say let's get back to that, and first consider long-term corporate bonds again. We see that we have a lot of variability here too. It doesn't quite necessarily help us very much. If we are going through this process in 1977 and 1982 we have negative

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rates of return again. I don't think any of us would want to set assumptions which impart a negative return on anything in our portfolio. If we do, then the investment managers are making big mistakes. For 1987 we had positive real rates of return, and for the past five years we had 10%. My first thought of using a 10% real rate of return is that it is a little high and I would not want to sign my name to it.

So we see here that history does not help us very much, other than point out that our job is very hard. I think that over the past five or ten years our job has gotten a little bit harder because history has been less of a guide than it was at any point in time. For purposes of selecting an interest rate, it also helps to look at current yields on fixed income investments, and some best guess as to what the stock market will do. We also take into account certain facts, one of which is that historically stocks have outperformed bonds; different kinds of stocks have outperformed other kinds of stocks, small company stocks for example have outperformed big company stocks. We can think about what that means in terms of selecting a consistent body of interest assumptions for different asset classes and putting it all together to arrive at a single interest rate.

Leaving the interest rate, I would just like to say it is a difficult rate to choose, but I think all of us know that there is a certain range outside of which we become uncomfortable. For me personally any interest range over 9% makes me squirm a little bit, and anything under under 7% makes me squirm also because we see that it becomes difficult to meet the + or -- fourth corridor on Worksheet 3.

Moving to the salary scale we move away from the broad indices idea and get to a company-specific idea. Each company has its own salary scale. It certainly should have its own salary scale. Salary scales tend to be an industry-specific sort of animal, and in many cases even more company-specific. It is sensitive to employee classification. We know that salary increases for exempt personnel has been different than salary increases for nonexempt personnel, or union personnel versus nonunion personnel. Those relationships tend to flip-flop from time to time, typically depending on the inflationary environment, but it is something to keep in mind when you think about salary scales. Also, given the aberration we have had in the economic situation over the past several years, it may be helpful to select alternate salary scales. We have a low inflationary environment now, or perhaps many companies are in a low salary increase mode with a look toward loosening it up a little bit or a look toward inflation loosening it up a little bit. So there are different ways to think about how to approach the salary scale. Certainly, likewise selecting alternate approaches towards the interest rate assumption is something deserving our attention.

When we think of the salary scale we tend to peg it somewhat less than the interest rate. I have not seen many plans using salary scales (at least for personnel age 40 and above) that exceed the interest rate that is used in the value of the plan. Typically it is within 1-3% of the interest rate.

Another item to keep in mind when looking at sets of assumptions is the concept of a weighted spread; that is, the difference of the interest rate and salary scale for two sets of assumptions. We can look at the weighted spread as being the interest rate minus 1/2 or 6/10 of the salary scale, and the general thinking is that if the weighted spread is the same for two sets of assumptions then they will probably give you about the same contribution requirements. It is useful in

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equating two sets of assumptions or in seeing similarities in practice. There are other factors that may or may not influence the use of that idea. I tend not to use it very much except for a very cursory look at a set of assumptions. Depending on whether you have a young group or old group you get very different results with the same weighted spread.

Finally, salary scale is really several pieces put together. You have your inflation component again, and for this purpose you should probably use the same inflation component you used for the interest rate. Inflation is inflation. Added to that are productivity, merit and promotional increases. In identifying rates of increase for each of these you should work very closely with the client and perhaps people in the personnel department in trying to identify appropriate percentages for these. Is a 1% productivity increase appropriate? Does it make sense for your business? What is your average merit increase? Is it 3% or 4%? How do promotions work? Are there promotional increases? Is it a 10% increase for promotions that occurs every four years? It is just something to think about. I have not seen most people go into that kind of detail in approaching salary scale, but it may be fairly helpful to do that from time to time.

Retirement age is an assumption that is usually not paid a lot of attention. I think that in looking at things like postretirement medical benefits we will be forced to look at it a little bit harder. For plans that typically have not subsidized retirement benefits we've used age 65, because it is actuarially equivalent. That has probably been okay, but I think that you should dig a little deeper. Certainly if there is any kind of subsidy, no matter how small, you should analyze the retirement assumption fairly closely with an eye towards lowering it to more accurately fit the retirement pattern of the group. Retirement rates are very useful for this purpose. But even when using retirement rates you should look at those rates closely to make sure that they follow the pattern of retirement of the group or produce approximately the same actuarial value as the pattern of retirement. What I tend to do typically when I am analyzing retirement age is to consider the first year in which full benefits or 95-100% of full benefits are paid and the first age at which an individual can receive social security benefits, which is age 62 and, of course, age 65. If you look at retirement experience you see bunches around those three ages, and if you use a single retirement age assumption, then some appropriate weighting of those three ages may be called for.

Moving to what I see as less important or less influential assumptions -- first is the social security assumption for plans where you have an offset formula or a moving wage base, for example. For an offset plan you have to select an assumption for cost of living increases and wage base increases. I think that the assumptions that are chosen for these should be consistent with what you have chosen for your salary scale, or the inflation that's underlying the interest rate and salary scale should be consistent with the inflation rate used to choose your social security parameters. Also your salary scale assumptions should probably be greater than your wage base increase assumption for social security. A wage base assumption for social security is a very broad measure and does not accurately take into account things like productivity, merit, and promotional increases. In a corporation measuring a single individual, the effect of these items will exceed the inflationary effect of wages that is measured by the wage base index increases from year to year.

Moving to turnover and disability -- these tend to be company-specific. For companies that do not have a broad base of experience there are standard tables

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that can be used to approximate that experience. The ones I have seen most often are the Crocker Sorensen T-1 through T-9 tables, or however far they go. Typically you have some sparse experience and you pick a Crocker Sorensen table that approximates that experience. When you smooth out your experience it creates a nice fit with one of the Crocker Sorensen tables.

A mortality table is almost universally a standard table except for the very large plans. When looking at a mortality table to use for evaluation, I find myself hard pressed to defend something like a 1951 Group Annuity Table (GAT), especially when your client says, "I've heard about this 1984 Unisex Pension (UP) table. That seems like a recent table." Typically I look at a 1971 GAT, a 1983 GAT, and the 1984 UP. Keep in mind though that two of those tables are insurance tables with margins built in for reserving requirements and anticipated improvements, and will give you different results than a 1984 UP. I don't know if anybody has changed from a 1984 UP to a 1983 GAT in doing evaluations, but the liabilities of the plan would increase by close to 10% depending upon your group, just by changing from those two mortality tables. It is very difficult for a layman to understand that you are moving back one year and yet you are being more conservative. It is an anomaly that forces the actuary to fully understand how the tables are constructed. But, anybody who took the old part 5 on characteristics may be grateful that they did so. I didn't have to take it, but I am grateful that I didn't have to.

Moving on to FASB assumptions, the one that we focus on most is the discount rate. This is required to reflect current annuity purchase rates, but there is nothing out there that tells us what those really are. It is hard to pull something off the shelf or go to the Wall Street Journal and get the current annuity purchase rates. You can survey insurance companies and if you are lucky they will help you out and give you a feeling for how these things work. If not, FASB says to look at current securities and long-term fixed income investments to help you choose these. I think when selecting these you should avoid indexing them to some given rate. I know that at least one big accounting firm, when they send out their annual questions asks, "To what index have you fixed your selection of the discount rate?" When I saw this I said to the client, "I am going to write back and say that we chose the discount rate in accordance with FASB 1987 which is, more or less, give the word back to them that they gave to us." I think that when we should preserve the flexibility of the client in all cases. Many clients find a sense of comfort in fixing their interest rate and accepting the results, no matter what that may be. I think that where we can exercise judgement and maintain some ability to manage the results for the client, we are doing a service for the client. I think that when we take away that flexibility and inhibit their ability to manage their results, we are in a sense doing a disservice to the client, although we are making our job and their job somewhat easier. We have to justify our pay, after all.

For the purpose of choosing this kind of rate we looked at everything from a Moody's AA -- to Moody's A, utilities and industrial, the Shearson Lehman bond index, and 30-year treasuries with or without coupon. Any of those rates provide some guidance as to the movement or the trend in rates from one measuring period to the next. I strongly believe that where rates have gone up or down the discount rate should do the same -- it should go up or go down in accordance with the general movement in rates. I attach some caution in using the PBGC immediate rate for your FASB discount rate. If you were to look at how PBGC rates changed from September 1987 to September 1988, and how these other broad indices changed over the same period you will see that they moved

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in opposite directions. The PBGC rate went in the opposite direction of these broad indices that you used as guidance in selecting your discount rate.

Presumably the annuity purchase rates reflect the investments currently available for investment by the insurance companies. Therefore, since you can invest in PBGC immediate rates you would have to invest in the standard security that we know very well -- the 30-year treasury bonds and so on. I think the most important thing, though, in the discount rate is preserving that element of judgement -- the element of flexibility, but recognizing that there are certainly some reasonable grounds to be held.

Turning to the long-term rate -- this is the rate that should reflect the plan assets, which means that if you have invested in a passbook savings account you should probably use 5.25% or 5.50% or whatever the passbook rate is. Obviously we don't do that. Larger plans have investments in a myriad of types of investments -- real estate, foreign obligations, stocks and bonds, of course. I think the long-term rate should be compared to the discount rate. It is very easy to argue that your long-term rate for a balanced portfolio should be greater than the discount rate. Considering that if your discount rate is based solely upon fixed income investments, and your portfolio is half equity and half fixed income, and adding the fact that equities have outperformed fixed income for the past any number of years, you can easily construct an argument that if our long-term rate represents a portfolio, we expect to earn more than a similar portfolio used to determine our discount rate. But, let's set that for one year and let's pick the discount rate at 9% and the long-term rate at 9.50%. Let's say rates go up so that our discount rate increases to 10%. Now we we have a 10% discount rate and a long-term rate of 9.50%

Using that kind of thinking, we find that we are at an inconsistency of assumptions. Let's look at our situation now and ask what our long-term outlook is? Well, we expect our fixed income instruments to yield 10%, and we would expect our stock to do a little better. So, our long-term rate does not seem to be appropriate any more. The point of all this is that we should not be afraid to consider frequent changes in the long-term rate of return. There is no guidance given as to how often we should change this. We hear long-term and we think it should be the same for a long term. Well, I don't think that is really true. I think there is some room to change that and some room to manage the long-term rate of return.

The salary scale used for FASB 1987 can be the same as for your funding valuation, but I think you should keep in mind that the underlying inflation used for your discount rate is something different than the underlying inflation used for your funding interest rate. Therefore, shouldn't your salary scale for FASB be something different than your salary scale for funding? Yes, it probably should. Also, by moving the salary scale in tandem with the discount rate up or down from year to year, we tend to have a smoothing effect on the liability side of the equation. Altering the salary scale from year to year can be a useful means to help your clients move pension expenses. It is another tool to manage your expense outcome from year to year.

Finally, for FASB 1987 I think that one of the most interesting things is the relationship between the discount rate and the long-term rate. If you think about it the discount rate is something that changes every year, and yet in our calculations operates over a 75-year period; and our long-term rate of return, which we think of as something operating over a 75-year period, actually



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operates over one year. So, it is a bit of an irony that the selection of the one assumption is based on short term but is operating over such a long term and the selection of the other is based on long-term considerations but operates under such a short term.

Moving on to the current liability -- when I read over FASB 1987, I got the sense that the criteria for selecting the interest rate for current liability calculations sounded an awful lot like the selection of the FASB discount rate. If they are both supposed to reflect current annuity purchase rates, how can you choose different rates for current liability and FASB discounts and tell somebody that for that purpose we have one set of annuity purchase rates, but for this purpose we are going to have a different set? In selecting current liability interest rates we have this corridor, and this creates more thinking for actuaries to do in selecting the current liability interest rate. If your funding interest rate is outside of the corridor, some people believe that choosing the point of the corridor nearest that interest rate satisfies the requirement. I don't think that is the case. I think that what you have done there is use the criteria that runs along the lines of pick the interest rate in the corridor nearest the funding rate. Nowhere in there do I hear anything like, pick an interest rate that reflects annuity purchase rates. It is a convenient method to select the current liability interest rate, but I do not think it is an appropriate one.

Another angle on this is that if your funding interest rate is within the corridor, it is easy to think that, well, we can use that for our current liability. But, again, you have to go back to the criteria -- go back to the guidance that says that you should select the current liability interest rates based upon current annuity purchase rates. Obviously, if you can defend that selection by pointing to something like an annuity purchase rate or similar rate, then I think that you are pretty safe. But to just assume that if your funding rate is within the corridor then your funding rate can be used for current liability, I think you are moving too quickly -- you are not looking for enough. In thinking about what the appropriate rate is, we know that the PBGC comes out with interest rates monthly, and presumably these interest rates reflect the annuity purchase rates. It would seem logical for the IRS and the PBGC to get together and perhaps formulate some kind of strategy as to providing guidance to us in what annuity purchase rates are, not necessarily saying this is the rate, but provide some benchmark which perhaps we can think of as a safe harbor in helping us do that.

Finally, for those of us that like the herd approach, it might be useful to take a quick look at what current practice is. For current practice of funding assumptions, for the Fortune 50, or in this case the Fortune 48, two of the Fortunes do not have defined pension plans. There is a very high concentration of interest rates between 8% and 9%. This is not really very surprising. There are not any rates of 5%. If you read BNA from time to time, you know that there is invariably a situation where the IRS has determined that a 5% interest assumption is unreasonable. Unfortunately there are none at 5% in our Fortune 50.

For the salary scale there is a high concentration around 6%. These percentages represent the average salary increase for people age 40 and above. So, they ignore those high annual salary increases for new entrants say at about age 25, which we see at 10% or 11%. Looking at the spread or the arithmetic difference between the two, the spread is roughly 2-2.5%. This indicates that 8% interest

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and 6% salary scale, or 8.5% and 6% would appear to be pretty close to current practice. Turning to our FASB 1987 assumptions, as of fiscal years ending in 1987, for the discount rate the average is 8.8% -- very close to 9%. For the long-term rate of return it is a little bit higher with a concentration of around 9-9.5%. So, we do see in practice that on the average companies are selecting long-term rates of return a little bit greater than their discount rate.

MR. LABOMBARDE: I think we have seen a fair review of the basis that a typical consulting actuary goes through in setting the assumptions. Since Ray said he was somewhat comfortable with 7-9% I take it I can read into his comment as saying that at least if the 8.5% is consistent with the other assumptions, that is, if there is not some other assumption, that is, breaking his rules at some point, then he would tend to feel comfortable with an 8.5% assumption. I am picking on the 8.5% because one of the things we had this year was a plan where there apparently was some offending assumption or some situation that caused the plan to break the 4% bound on the IRS audit guidelines. That plan was not a plan with the 5% assumptions, it was a plan that had an 8.5% interest rate assumption. The IRS, choosing to try and decide what the offending assumption was, said that the 8.5% needed to be changed in order to reflect the fact that the plan was outside the 4% guidelines.

We also had an interesting year in actuarial assumptions in other respects. We saw a court case that was handed down in August on actuarial assumptions that I think Kathy may have a few comments about. Of course, Ray reviewed some guidelines that came through that were implemented as of the beginning of the year on current liability and on using explicit assumptions for funding. We of course also have the new assumptions for the PBGC calculations of variable premium. So, it has been a rather banner year for regulatory guidance on assumptions, and I am looking to comments from Kathy Marticello of the IRS in trying to sort some of this out for us.

MS. KATHRYN G. MARTICELLO: I am going to confine my remarks mainly to actuarial assumptions used under Section 412. Now, COBRA 1987 did introduce two things into Section 412: first, a change in the definition of how actuarial assumptions will be judged as reasonable or unreasonable; and second, a concept of contingent liability that is used for certain purposes under that section of the code, specifically to calculate the full funding limitation and to calculate the deficit reduction in contribution under Section 412 L.

Under prior law actuarial assumptions were to be reasonable in the aggregate or to be based on plan experience and were to reflect the actuary's best guess as to what future experience would be under the plan. Now COBRA 1987 changed the definition of what would be considered reasonable actuarial assumptions to specifically provide that each individual assumption on its own should be reasonable. Moreover all costs and liabilities are to be based on actuarial assumptions that are individually reasonable and on actuarial methods that are reasonable.

Now, when is an individual assumption considered to be reasonable? I think there are two main criteria. First, the assumption must take into account plan experience. Second, it must be experience during a recent period of time. As Ray mentioned (I didn't think anybody in the whole world except myself remembered that there was a revenue ruling 63-11 -- I was amazed to hear that) revenue ruling 63-11 did specifically provide a five-year look-back for purposes of determining a recent experience under the plan -- for determining whether an

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actuarial assumption is reasonable. Now the Service is currently trying to develop temporary regulations with respect to both contingent liability for funding limitation changes and definition of reasonable actuarial assumptions and some guidelines as to how to select reasonable independent actuarial assumptions. It is possible that there will be a look-back period or some recent period specifically mentioned in that regulation. Whether it will be five years or a different number of years I don't know.

Before I start in on the individual assumptions, interest rates, mortality, etc., that would be considered reasonable, first I'll cover the basic valuation funding assumptions under the plan. Later on I will consider what assumptions would be reasonable for calculating contingent liability. I would just like to briefly mention the fact that these standards do also apply to actuarial methods that are used to determine costs under the plan. There are two examples that I can think of right off the top of my head that are methods that would not be considered reasonable. The first one is the use of the unit credit funding method where an individual is accruing more than 10% of the 415 maximum in one year of participation, because he has certain years of past service that allow him to accrue more than 1/10 of the 415 limit in one year. After I have covered interest rate assumptions I will refer to a court case that was handed down in August -- the Mirza case, which did deal with this method of being employed by an individual. It did state in the opinion of the court that the deductions taken, assuming that all of the accrual could be assumed to be normal costs rather than attributable to past service, was an unreasonable method, and was not permitted in calculating deductions for the year.

The only other unreasonable method that comes to mind off the top of my head the entry age normal method, using an average entry age rather than individually calculate normal cost for each individual based on the actual entry age. We had some problems with that when the assumed average entry age did not correspond in any way to the actual average entry age of individuals under the plan.

Interest rate -- I am only talking about the valuation interest rate, not the current liability interest rate. What are the criteria that should be applied to the interest rate chosen for the valuation interest rate? It should represent a reasonable expectation of the rate of return on plan assets. Now, I certainly agreed in general with everything that Ray said, and if Ray were doing all the plans in the world I am sure that we wouldn't have any problems. I think there is only one thing he may have said that could be open to some dubious interpretation, and that is setting your criteria by looking at what other people are doing. I think basically what the rules will zero in on, is that you are required to look at the asset performance of the trust associated with the individual plan. Now, that means if your individual plan assets are invested in CDs, it is not appropriate to look at a stock index, for example, no matter what other plans are using. Those plans should be using rates based on the actual investments made by the trust under that plan. So, you need to look at plan experience, not general experience. You also need to look at recent plan experience. Now, as I said, which period of recent plan experience is not entirely clear. I think five years would be a reasonable period of time. I am not saying that something other than five years would be an unreasonable period of time.

Another thing to be taken into account is something that was mentioned in the Mirza case, and I will try to clarify it when I talk about the Mirza case. That is, you should be looking at the expected rate of return for the life of the plan

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relative to the rate of return that could be achieved using treasury instruments for the same expected life of the plan. Now, most plans are assumed to be permanent. In that case it would be appropriate to look at 30-year treasury constant maturities. If the plan assets are assumed to grow at a rate that is substantially less than a rate that could be achieved on 30-year constant treasury maturity, assuming that it is an ongoing permanent plan, then it is difficult to see why the plan assets are so invested. The only reason that you would invest in a bigger risk environment is to get a better rate of return. If you could improve your rate of return by investing in treasury maturities it is difficult to see why you would not do so. So, I think you would need to take into account what these treasury maturities would be earning based on the expected life of the plan.

Some things that you might not want to take into account when you set your actuarial assumptions are investment rates for periods that are in the distant past; for example, maybe 10 years ago. You will want to look at the experience in a recent period of time. Also, you would not necessarily want to take into account the assumptions that are used for actuarial equivalence in the plan. Just because the plan has a lump sum option that is based on a 5% interest rate does not mean that plan assets necessarily will be earning at 5% interest, and it does not necessarily mean that a 5% rate is an appropriate valuation assumption. As I said, you would not want to be looking at indexes that are not related to the actual investments under the plan.

Now that I have just generally gone through methods and interest assumptions, I would like to discuss the Mirza case. This was a decision that was handed down in the District Court of Illinois on August 12, 1988. It deals with both an unreasonable funding method and an unreasonable interest assumption. The case is Jerome Mirza. This court case dealt with a plan that was adopted by Mr. Mirza 12/31/80. There were two participants in the plan, Mr. Mirza was age 43 and was earning approximately \$275,000 a year. Mr. Doris, who was age 33 was earning approximately \$27,000 a year. These were the only two participants in the plan. The retirement age under the plan was 55. The actuary chose 5% as his interest assumption. Now, the benefit terms of the plan were that you needed three years of service to become a participant in the plan, and it was 100% vesting. Under the old vesting rules that was permissible. Once you became a participant, from your first year of participation you accrued a benefit of, I believe, approximately 30% of compensation. For the next three subsequent years you accrued a benefit of 5% of compensation. There was some provision for a small social security offset to the benefits. Now, for purposes of the deductions and funding, the actuary assumed that the full 30% of compensation accrued by Mr. Mirza and Mr. Doris in the first year of participation was normal cost, that there was no past service phase, and that the entire amount could be deducted in full in one year as normal cost. The Service challenged this as an unreasonable method in that it was an improper allocation of liabilities under the plan to years of service. If Mr. Mirza did not have three years of prior service he could not have accrued a benefit 30% of compensation in the first year of participation. That is because the 415 limit is prorated over the first 10 years of service. So, the Service contended that the most that could be charged to normal cost was 1/10 of the 415 limit. The rest was a past service benefit and should be amortized for deduction purposes over at least 10 years and for funding purposes, at the most over 30 years. That is the method issue.

Now, with respect to the interest rate issue, the judge reasoned, based on the brief that was submitted by the Service, that the assumption should be based on

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the experience of the plan and reasonable expectations. Now, even though the actuary had assumed a 5% interest rate, there were no prior years of experience on which to draw. There was no five-year look-back here. However, some investments had been made prior to the valuation date, and some were made after the valuation date. The investment that had already been made by the valuation date were CDs, and they were earning interest in the range of 12%. Contributions that were made after the valuation date were also invested in CDs and they were earning in the range of 11.65% to 15.75%.

The judge reasoned that these investments were indicative of a type of investment that the plan intended to make and that for the purposes of this valuation the plan should be looking at earnings based on this type of investment.

The second criterion was the projected experience under the plan. Now, since Mr. Mirza was already 43, the actuary assumed that he would retire at 55. Given that that was a correct assumption, not even challenging that assumption, there are only 12 years left for this individual to fund an accrued benefit under this plan. Now, since he was the sole owner of this corporation it was also not reasonable to assume that the plan would continue after this individual retired because the corporation would likely be dissolved. So then the judge reasoned that if you look at treasury bond rates, (he took two weekly rates -- 12/26/80 and 1/2/81 -- which straddled the valuation date), 10-year treasury maturities were available at 12.3% and 20-year treasury maturities were available at 12%. Now, since the plan was so front loaded, even if you use the unit credit method the way the taxpayer wished, a lot of the funding would be coming in at the beginning of the inception of the plan and therefore would be invested for a short period of time in CDs. Alternatively, the money could be invested in treasury bond rates and earn at least 12% over the expected life of the plan. Therefore the court did not accept the taxpayer's argument that 5% was a reasonable interest rate and accepted the adjustment that was made by the Service. The Service did not adjust the interest rate not all the way up to 12% -- I don't remember the exact adjustment that was made for purposes of disallowing deductions. The taxpayer had argued that the 5% was reasonable based on certain forward going weighted averages of different stock indexes. This was rejected based on the criteria (1) the plan was not invested in stock and (2) the funding was going to be so front loaded there was no reason to assume that large portions of the fund were going to be invested at a later date in stock indexes that would have a low rate of return.

I guess that that is all that I can say about Mirza, but the main thing that I want to point out is that it does reinforce the main points that I have been trying to make. In setting your assumptions for your interest rates you need to look at what the plan is invested in, you need to look at the expected lifetime of the plan, and you need to look at what the plan could get in risk-free investments and treasury bonds over that expected lifetime of the plan.

Mortality rates, of course, are also required to be independently reasonable. It is very difficult to judge based on experience and gains and losses for an individual plan whether the mortality assumption chosen is reasonable. You can go through and separate your gains and losses by source, and you can do an analysis over a prior period of years to see whether you have a pattern of large gains or large losses based on your actual mortality versus your expected mortality, but if you have a very small plan all you need is one person to die. It is very difficult to judge whether your mortality assumption is reasonable or whether you should have a mortality assumption at all in a small plan. However,

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usually generally acceptable mortality tables can be used. The Service in the past has not challenged most of the mortality tables in use. I think there may be more of an inclination to challenge some mortality tables. For examples, the 37 Standard Annuity Table and the GA51 Table would probably not be considered indicative of current mortality trends. So what you want to do is pick a mortality table that really reflects current mortality experience.

Projection scales also when applied to mortality tables should be reasonable. If the mortality table you have chosen along with a projection scale would give you a level of expected mortality that was in line, for example with the 1983 group annuity tables, then I think that probably would be acceptable. It might not be acceptable to use the UP 1984 table with a 10-year set back. People have been using mortality tables that most responsible actuaries would really and truly not consider to be reasonable, particularly in the set-back area. For 415 purposes individuals have been coming in and saying they are going to use the UP 1984 table with a 10-year set-back. It is a hard stretch to see that that would be a reasonable mortality expectation.

The next thing I would like to cover (Ray had mentioned this) is that assumptions should be consistent. For example, assumptions should be consistent with the benefits structure under the plan. If you have a plan that provides \$50/month for every year of service, or \$10/month for every year of service, and you are spreading your cost over the present value of future compensation, it may not be acceptable or appropriate to use a salary scale to spread those costs. If you have a plan where benefits are based on compensation, and you are using a 5% salary scale to project benefits, it may not be appropriate then to use an 8% salary scale to calculate the present value of future compensation when you are spreading your costs over future compensation. Your assumptions should be consistent, and also should offer the actuary's best estimate of anticipated experience under the plan. Hopefully nobody will ask me how you are supposed to figure that one out.

Those are the criteria to be used for evaluation assumptions. Now, the full funding calculations under Section 412, and the deficit reduction contribution under Section 412 L are meant to be calculated using a different interest rate. I will call it the current liability interest rate. That means a reasonable rate within a permissible range. Now, what is a permissible range? A permissible range is a 10% corridor of the weighted average yield of 30-year treasury constant maturities for the 48 months preceding the first day of the plan. We published a revenue ruling describing how we calculated the first weighted average interest rate and the first corridor. We will continue to publish monthly, hopefully, although we have not been able to in the past couple months. We are trying to establish a procedure to publish the weighted average interest rate and the range each month. If the plan's valuation rate is outside that range, then that rate cannot be used to calculate the current liabilities.

If the plan's valuation rate happens to be inside the range, then that is the rate that should be used to calculate current liabilities, if that rate is also consistent with the annuity purchase rate criteria. Now, the annuity purchase rate criteria are criteria that is applied to the rate that you choose within this range to calculate current liability. That means that in choosing an interest rate in that range you are supposed to ignore plan experience. So forget all I said about looking at the composition of the assets in the trust, the expected return on the assets in the trust, and recent investment experience. That is not taken into account here. What you need to consider are the annuity purchase rates that

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could be obtained at the current period in time and the inclusive interest rate that would be applicable if the plan terminated and you went to fund the value of your contingent liabilities. What implicit interest rate would be charged? As an example, in your committee reports an individual plan purchases annuities from an insurance company equal to the value of contingent liabilities, based on \$1,000 cost plus \$100 profit and expenses charged by the insurance company. You take that amount that the insurance company would charge, you know the contingent liabilities under the plan, and you infer the appropriate interest rate from that.

The Service is currently trying to do a survey with various insurance organizations and insurance companies similar to what the PBGC does to determine what appropriate annuity purchase rates will be. Hopefully, we will be able to publish some guidance. There are some problems because there will be differences based, as Ray said, on the complexion of the plan, whether you have a lot of young participants, whether you have a deferred annuity amount, whether you have a lot of older participants, whether you have immediate annuity amounts, and also the size of the plan. If you take into account the expense charges of the insurance company in calculating what your interest rate should be based on an annuity purchase rate, then there will be a difference depending on whether it is a large plan or a small plan because the insurance company usually will give a better break expense-wise to a large plan than they will to a small plan. So that is something that we are trying to work out now.

All other assumptions for purposes of calculating current liability other than the interest rate assumptions still have to be independently reasonable within the meaning of my prior remarks. For example, the mortality rate should still be independently reasonable, and any other assumptions that you would use should be independently reasonable.

MR. LABOMBARDE: The Enrolled Actuaries Report right now is starting a practice of printing a guide that shows all of the rates for the PBGC variable premium, the corridor rate for the current liability, as well as all of the other rates such as the rate that you have to use for crediting employee contributions in a plan. Of course the Enrolled Actuaries Report does not come out frequently enough for everyone. There are different groups within the Society that are looking for methods of trying to get those assumptions out to a broad audience some time in the near future. In the meantime, do refer to the Enrolled Actuaries Report. That will provide you basis for the rates.

