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WHAT'S UP? RECENT DEVELOPMENTS!

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This session will focus on issues and regulations that were breaking at the time of the meeting. The panelists will analyze the most recent announcements from the IRS, Department of Labor (DOL), and PBGC. Both retirement and nonretirement developments will be presented, with retirement-related issues emphasized.

In addition, of particular interest to pension actuaries, a report on the status of the new mortality tables (Group Annuity Mortality or GAM 1994?, Unearned Premium or UP 1994?) will be given. The discussion will address the difference between the tables and the reasons for the two tables.

MR. GENE BRYANT FIFE: I'm Gene Fife with Alexander & Alexander Consulting Group in Atlanta. I will be the moderator and a panelist for this session. My copanelists for this session are Nurez Jiwani, who is director of pension plans for the Pension Commission of Ontario, Canada, and Lindsay Malkiewich, who works in the Office of the Actuary of the City of New York. Lindsay is the chairperson of the Group Annuity Valuation Tables Task Force, which is part of the Retirement Plans Experience Committee.

The agenda for this session will begin with Nurez, talking about recent developments in Canadian retirement benefits. I will do the same for U.S. retirement benefits. Lindsay will then provide insight into the forthcoming group annuity mortality tables. We will conclude with a question and answer period from the audience.

MR. NUREZ JIWANI: I'm going to be speaking about Canadian pension issues, but particularly issues in Ontario, as well as the rules that apply in Canada, but particularly in Ontario. I will first give you a background of the Canadian pension environment, and then talk a bit about the pressures that we face in Canada, and particularly, in Ontario, in terms of competing priorities. Then I'll talk about the regulators' responses to these pressures, in terms of rules and policies. Finally, I'll throw out some questions as to where we are going in the future.

There are approximately 18,000 pension plans registered in Canada, covering approximately five million members. The asset size of these pension plans is about \$350 billion. Ontario has the largest number of pension plans registered, approximately 8,000 covering two million members, with an asset size of these plans of approximately \$135 billion. The coverage in Canada and in Ontario is approximately 45% of the paid work force.

Unlike in the U.S., the jurisdiction for pension legislation in Canada is provincial. Almost all of the provincial authorities now have legislation in place in the form of

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pension benefits acts. In addition to that, there is also federal jurisdiction from the tax perspective.

The pension legislation in Canada started in the 1960s. Ontario was the first one with the Pension Benefits Act in 1965, and for about 20 years, not very much happened in pension legislation in Canada or in Ontario until the mid-1980s. In Ontario, we had major pension reform legislation that came into effect on January 1, 1988. In the late 1980s, major pension reform came as well from the federal authorities basically to try to address the problem of inequity in the tax system between members of employer-sponsored pension plans and individual retirement savings plans.

Now with nine or ten jurisdictions across Canada regulating pension plans, this obviously poses a problem for multijurisdictional plans. To solve that problem, we have a reciprocal agreement between the provinces in place, so that a company, that has a pension plan covering employees in two or three or five different provinces, can register with just one jurisdiction. And that jurisdiction would be the jurisdiction where the plurality of the members of the pension plan are employed.

Over the past five or six years, there have been pressures in the Canadian pension industry mainly because of competing priorities, competing interest of employers, plan members, unions, and the government, as well as pressures in terms of decisions coming from courts. Let's look first at the employers. Employers would like to minimize funding and, therefore, whenever there is surplus in the plan, take contribution holidays. Also, when there is overfunding or surplus in their plans, employers would like to withdraw the surplus for business purposes.

Employers would also like to reduce cost in terms of conversions, and if the defined-benefit plan becomes too expensive, it can convert to a defined-contribution plan. Or, if the employer has two or more pension plans to merge them, to reduce cost.

And finally, there is a lot of downsizing going on due to what has been happening in the Canadian economy over the last three to five years, which means that employers want to put in place early retirement windows to retire older workers. Employers have had to wind up pension plans, either in full or in part.

The other interested party in all this is, of course, the plan members and particularly, the unions, which are concerned about benefit security. They're concerned about entitlement to benefits on plan conversion or wind-up. They're very much concerned about the ownership of surplus in pension plans, and there is more pressure for fair and adequate disclosure of information under pension plans.

Also, we've had court decisions on various types of issues that affect the pension industry. In the area of contribution holidays, generally Canadian legislation permits contribution holidays. But in some major court decisions, the courts have ruled that the plan language prohibited the employer from taking contribution holidays. That raises an issue for some employers.

With respect to plan mergers, there have been court decisions where, several years after a plan has been merged, the court has ruled that the plan assets must be split

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on the basis of the language of the original plans. In the area of entitlement on wind-up, issues that the courts have dealt with, the courts have ruled very much in favor of plan member entitlements, particularly, the older workers.

In the area of surplus ownership, there have been several court cases in which entitlement to surplus has been fought over by plan members, unions, and of course, employers. In these cases, the courts have generally looked to the plan provisions or trust principles. However, the decisions of the court to put it mildly, have been all over the map in terms of surplus going to the employer, surplus entitlement being that of the employer or of the employees.

And finally, in the area of partial wind-up, in a major decision that just came about, the courts ruled on a particular case, where 700 employees had been terminated out of 4,000 members of the pension plan. That number was significant and triggered a partial wind-up of the pension plan.

In response to all these pressures and priorities of the various parties, how has the government responded and how have the regulators, such as the Pension Commission of Ontario, which I work for, responded to these pressures and issues?

To explain this, I'll highlight some of the rules that we have in Ontario that are either embedded in the regulations or that are commission policies. In the area of ongoing plan surpluses, the legislation generally permits that actuarial gains can be used to offset future contributions, provided that the gains are first used to offset, to fund any deficits in the pension plan.

In the area of surplus withdrawals in ongoing plans, there is basically a moratorium. There is a way of getting surplus out of an ongoing plan, but it requires the consent of 100% of the members, and obviously, we've only had one case in the last several years.

With respect to funding, the regulations require that an actuarial valuation be done of the defined-benefit plan, once every three years, which would include two types of valuations. One is the going-concern valuation, in which case the unfunded liabilities resulting from going-concern valuations are required to be funded over a maximum period of 15 years. The regulations also require a solvency valuation to be done. The solvency valuation is determined as if the plan had wound up on the date of the valuation. If there are solvency deficiencies resulting from such evaluation, the deficiencies are generally required to be funded over a maximum of five years.

Ontario is the only province in Canada that has the Pension Benefits Guarantee Fund which is similar to the U.S. PBGC. This fund covers pension benefits under defined-benefit plans, up to a maximum of \$1,000 per month. The fund is funded through assessments that are levied on employers. The annual assessments are \$1 for plan beneficiary, plus a percentage of solvency deficiencies. And it's a graduated rate, so that the higher your solvency deficiencies, the higher the rate that you are charged as an assessment. The maximum assessment is \$4 million for most plans. The Pension Benefits Guarantee Fund, particularly in the recent past due to the recession, has had a significant increase in the number of claims against it. The current situation is that

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we have a balance in our fund of approximately \$17 million, with outstanding claims, approximately 35, of \$26 million.

If an employer wishes to convert a plan from defined benefit to defined contribution, the Pension Commission has policies, mainly in four areas. In terms of the commutation of the benefits from defined benefits to defined contribution, the policy basically requires the use of a standard established by the Canadian Institute of Actuaries—minimum value. Whether or not salary projections are used as part of the conversion process depends on the wording of the pension plan. You may have a plan that provides for salary projection, but on conversion, depending on the plan provisions, and the authority to amend the plan, the plan could be amended to remove the projection for conversion purposes.

The policy requires that each and every member of the plan be given an option whether or not he or she wishes to convert his or her benefits. Any member that wishes not to convert benefits would remain entitled to the defined benefit. If there is a shortfall, a funding shortfall on conversion, it must be paid up immediately.

In the area of plan mergers, the Pension Commission has come out recently with a policy. The basis for the policy is that the Pension Benefits Act requires the Pension Commission in these cases, and the legislation uses the words to "protect member's pension benefits and other benefits," a very loose term. And based on that, the Pension Commission's policy is that, if the plans being merged are in a deficit, then the funding of the plans must be brought up to the level of the highest funded plan. If any of the plans being merged have a surplus, then the employer is required to seek a court order on surplus entitlement. This is perhaps the most controversial part of our policy.

In the area of early retirement windows, early retirement windows can be awkward, provided the eligibility conditions in terms of age and service are reasonable. So that the employer does not pick one or two or five individuals, early retirement is based on some criteria. In offering early retirement windows, enhancements of ancillary benefits, such as bridging benefits and additional years of service up to retirement are permitted.

There should be full disclosure of the early retirement window. In terms of funding, if there is surplus in the pension plan, the early retirement window can be funded out of the surplus. If the plan is in a deficit position, then the cost of the window must be funded immediately.

With respect to full wind-ups, the legislation requires immediate vesting of all pension benefits. Ontario also has the requirement for what's called *grow in*. Under this provision, members whose age plus service is equal to or greater than 55 are entitled to grow into enhanced early retirement benefits that are available under the pension plan. This is quite a generous and obviously a very costly benefit.

If there is a deficit on wind-up, then it must be funded over five years. It's annually in advance, so it's really four years funding. If there's a surplus in the pension plan, then there are various rules that apply, but the basic rule is that, if the employer

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wishes to withdraw the surplus on wind-up, it would require consent of two-thirds of the members of the pension plan.

With respect to partial wind-ups, particularly with the downsizing that has been going on over the past few years, we've had a number of partial wind-ups. There are two situations where a partial wind-up is generally triggered. One is where there is a significant number of members of the pension plan who are terminated. The other situation is where there's a discontinuance of business at a location, for example, a plant closure. When there's a partial wind-up, does surplus become an issue? The answer is very much so in Ontario. The surplus related to the partial wind-up must be identified and dealt with as part of the partial wind-up process.

As a result of all these pressures and issues, competing interests of employers, beneficiaries, unions and government, and the various court decisions, the result has been extremely complex rules in Ontario, and an uncertain environment, particularly for employers.

In view of that, I think we have to ask the question, where are we going in terms of the pension industry in Ontario or in Canada as a whole? What, for example, are the employers doing? The employers faced with all these difficulties are often winding up their plans. At the Pension Commission, we've wound up approximately 4,000 plans over the last six years. Employers are also converting plans to defined contribution or attempting to merge plans.

What do the unions have to say? The unions generally are very concerned about the retirement security of their members, but they have very strong positions on surplus and other issues related to pensions. Do the members care? Not really. There's a lot of apathy, I believe, among the membership. The members are more concerned about job security. Is the government interested? My view is not really. I think the government is more concerned about the immediate problems of the economy and so on, rather than the long-term problem of retirement income planning.

So does anybody care? What can the regulators do? My view, not to be totally pessimistic, is that the regulators are very much in a position and should play a leadership role in bringing the issues and the players in the pension industry together, to help create an environment for adequate pension plan coverage and retirement income planning.

MR. FIFE: In terms of recent developments in the U.S., we will look at pending legislation, IRS pronouncements, the determination letter process, DOL pronouncements, PBGC activity, and court cases. A major legislative bill that would affect retirement benefits is the so-called PBGC Reform Bill, also known as the Retirement Protection Act of 1993, which would be the subject of hearings before the Senate Finance Committee.

The bill would increase the Omnibus Budget Reconciliation Act (OBRA) 1987 additional funding charge for those plans with relatively high unfunded current liability. The assumptions allowed for determining this current liability would also be made more conservative, in particular, the current liability interest rate could only be

90–100% of the weighted Treasury interest rate, as opposed to 90–110%, which is the current allowance.

Other provisions are designed to give the PBGC more expansive powers over plans. In particular, the PBGC now has the choice of terminating a plan if it feels that plan in continued operation would create more liability for the PBGC. This bill would give more remedies to the PBGC to actually enforce minimum funding requirements. Also, the cap of \$53 on the per-participant, PBGC, variable-rate premium would be phased out over three years. This cap was useful for significantly underfunded plans, because once the underfunding reached \$53 per participant, there would be no additional premium.

One of the most controversial provisions in the original version of the bill was the elimination of cross-testing defined-contribution plans on a benefits basis. Cross-testing allows greater defined-contribution allocations for older participants than for similarly situated younger participants. As we'll discuss later, the provision may be changed to allow "nonabusive" cross-testing. The bill would also provide relief from quarterly contribution requirements for plans that are fully funded on a current liability basis, and relief from excise taxes for employers that cannot deduct all of their defined-benefit and 401(k) contributions, because of the 25% of combined payroll deductible limit.

Another piece of legislation pending before Congress is pension simplification, which is part of the Tax Simplification and Technical Corrections Act of 1993. The House passed this bill in May 1994, but it has yet to make headway through the Senate. This bill covers a variety of topics affecting retirement benefits, including increasing the flexibility in the average deferred percentage (ADP) test for 401(k) plans, simplifying the definition of highly compensated employees, applying Code Section 401(a)(26) minimum participation requirements to defined-benefit plans only, and allowing plans to use the Social Security retirement age as a uniform retirement age for purposes of nondiscrimination testing.

IRS limits that are adjusted for annual cost of living would be rounded down to the next lower \$100, \$1,000, or \$10,000 increment, depending on the limit. An intriguing provision of this bill would relax the 150% current liability full-funding limit for sponsors with plans that have heavy concentrations of active employees. But on the flip side, in order to make this particular provision revenue neutral, there would be a cutback, making the 150% lower for other plans.

Congress is also considering legislation that would increase the required eligibility service that veterans would receive on account of their time in military service, upon reemployment with an employer. Senator Metzenbaum is proposing a Pension Bill of Rights, which would mandate coverage for all full-time employees of an organization or separate line of business, and in fact, even some part-time employees. This proposal would also require full vesting in defined-contribution allocations by the end of the plan year in which the allocations were made. Benefits for spouses would increase over the current requirement of the 50% joint-and-survivorship (J&S) benefit. Other provisions would deal with disclosure and legal enforcement of pension rights.

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In terms of recent IRS pronouncements, Revenue Procedures 94-41 and 94-42 modify existing procedures for requesting minimum funding waivers and retroactive plan amendments that can be used to decrease benefits in the event of a substantial business hardship. Any requests made after June 27, 1994 must comply with these new revenue procedures.

In Notice 94-23, the IRS solicited comments from the public in developing additional guidance pertaining to spousal consent under Code Section 417. Specific areas requested for comment were the type of information to be included on a spousal consent form, explanation of the ramifications to the spouse of signing the J&S waiver, and examples of model language for use on a spousal consent form.

In a recent private letter ruling, the IRS reversed its prior position of allowing a transfer of monies from a nonqualified deferred compensation plan to a 401(k) plan, after the end of the year in order to top off certain deferrals of highly compensated employees, based on the final results of the ADP test for the year. Some practitioners are looking for alternative ways to accomplish this same thing without the original IRS ruling that was made back in 1992.

The IRS has also solicited examples of "nonabusive" uses of cross-testing. Possible amendments suggested to make the cross-testing "nonabusive" include (1) tightening the spread between the highest and lowest allocation rates that can be provided in a plan, (2) subjecting the allocation structure to testing under benefits, rights, and features, and (3) increasing the top-heavy minimum requirements. The IRS is expected to soon issue final regulations for the OBRA 1993 \$150,000 pay cap and Tax Reform Act (TRA) 1986 qualification of separate lines of business. Guidance is also expected on the Federal Insurance Contributions Act (FICA) taxation of nonqualified benefits, especially in light of the removal of the wage base on the HI portion of the tax.

The IRS is also considering expanding the automatic approval for funding method changes that had expired in 1993. Guidance is also expected to be forthcoming for cash-balance plans, namely on the interaction between the cash-balance account and the underlying accrued benefits. A nondiscriminatory safe harbor for cash balance plans is not expected to be issued this year.

Concerning the determination letters, the IRS last month issued Revenue Procedure 94-37, which amended Revenue Procedure 93-39 that was issued in 1993 and turns out now to be the pivotal revenue procedure for applying for a determination letter when your plan is not a safe-harbor-type plan, or in the case where a plan does not meet the ratio percentage test for coverage. Submissions for determination letter requests will no longer require enumeration of every benefit, right, or feature that is universally and currently available to all participants. Since provisions in a plan that are designed to be uniformly available to all participants can be very numerous, it made sense from IRS's point of view that there was no need to have to enumerate every single benefit, right, or feature.

A similar situation occurs for service provisions in a plan that are designed to satisfy requirements other than nondiscrimination. For instance, service provisions that deal with mergers and acquisitions that are not used directly for the nondiscrimination

testing would not be required to be enumerated. The request for determination letter filing deadline in order to qualify for extended reliance has been moved to December 31, 1994, for certain volume submitter plans.

The IRS just issued its updated list of required modifications (LRMs) for master and prototype defined-benefit plans. The updated LRMs for defined-contribution plans were issued in March 1994. The deadline for individually designed plans is still set at June 30, 1994, and the IRS is hoping that a lot of sponsors will want to take advantage of this extended reliance so that there will be a large flow of submissions. Extended reliance, in general, would allow a sponsor to rely on a favorable determination letter through the end of 1998 plan years, without consideration of future IRS guidance on legislation covered by the determination letter. So, in other words for legislation of OBRA 1993 or before, any type of additional IRS guidance would presumably be exempted from consideration for those employers that are filing their determination letter requests by June 30.

The IRS is also considering issuing additional model amendments that sponsors could adopt without needing to request another determination letter. One example cited is the simplified option of determining highly compensated employees provided in the substantiation guidelines for nondiscrimination and coverage requirements in Revenue Procedure 93-42.

DOL has indefinitely postponed the requirement that the Schedule G be used as the attachment to the Form 5500 detailing plan assets. The DOL had intended to require Schedule G starting in 1994. The DOL is also expected to issue shortly final regulations under the Family and Medical Leave Act, and provide guidance on economically targeted investments, proxy voting rules, and annuity providers.

There's also been some consideration of reopening the filing amnesty program, which was last used in 1992, in particular, for plan sponsors that have not made Form 5500 filings, commonly for welfare and severance plans. The DOL proposes to issue a class exemption for prohibited transactions that are authorized by DOL settlement agreements. The current practice has been to issue individual exemptions. The DOL and IRS are also expected to provide guidance to employers that contributed property that would violate the prohibited transaction rules as affirmed in the Supreme Court's *Keystone* decision.

The PBGC is working on its list of 50 companies with the highest unfunded guaranteed benefits as of the 1993 year-end. The interest assumption used to approximate the liabilities for guaranteed benefits is expected to be about 75 basis points lower than the 6.4% interest rate used in 1992 year-end. The PBGC premium payment regulations, which were issued in proposed form in April 1992, are now scheduled to be issued in final form in October 1995 to take effect in 1996. The PBGC's agenda also includes renumbering existing regulations to conform to ERISA section numbers.

There are typically a myriad of court cases that would be of interest to practitioners. I will focus on four recent decisions. The Second Circuit Court of Appeals has ruled that the IRS overreached in challenging as unreasonable a set of assumptions developed by the enrolled actuary for the law firm, Wachtell, Lipton, Rosen and Katz.

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In November 1993, the Fifth Circuit Court of Appeals also ruled against the IRS in *Vinson & Elkins*.

The *Albertson's* case is expected to be reheard by the Ninth Circuit Court of Appeals later in June 1994. The ruling handed out by this court in December 1993 would allow the employer to currently deduct interest credits on nonqualified deferred compensation, even though the employees had not yet been taxed on those amounts. The IRS has suspended considering requests for changes in tax accounting methods to take advantage of this ruling. Congress is also poised to pass legislation that would negate any precedent set by the court.

The Eleventh Circuit Court of Appeals ruled in *Dyce vs. Salaried Employees' Pension Plan of Allied Corporation* that Allied, which spun off a subsidiary, could retroactively amend its plan to change the definition of early retirement in accordance with the spin-off agreement. This prevented employees from the spin-off group from retiring from Allied's plan immediately after the spin-off, before the plan amendment had been adopted by Allied.

A U.S. Tax Court recently ruled in *Fazi vs. Commissioner* that a lump-sum distribution from a qualified plan could not be rolled over into an IRA, since the written plan complying with 1982 and 1984 tax law changes was never executed. The fact that part of the benefit was accrued while the plan was qualified, did not help the participant in this case.

MR. LINDSAY J. MALKIEWICH: The 1994 mortality tables on which our task force (the Group Annuity Valuation Table Task Force) is primarily focused is the development of the Group Annuity Reserving (GAR) Table. This table, as we stated in our position paper, and as has been published throughout the Society, will be linked with a projection factor and scale and produce generation mortality reserves, which we believe will produce a better and more credible minimum reserve standard in future years.

In the process of developing the 1994 GAR, we have also come up with what will be produced as the replacement to the UP 1984 table.

But before we went on with these new mortality tables, the Society charged our task force with making a recommendation for replacement of the 1983 Interim Group Annuity Table when we had credible experience, as we now have. We have also found that the margins to the 1983 table had to be replaced. The 1983 table committee, however, suggested that we replace that table in 1987. Well, we're a few years late.

In 1990 our task force was formed, and we came to the conclusion that we produce this table in 1994. We're now four years down the road, and we have a report in draft form. That will form what we believe to be the basis of our exposure report for the 1994 GAR table. It will be supplemented by two other reports. One that will be discussed is the UP 1994 table and a third report will discuss comparisons between the two reports, where one table should be used, and where the other table should perhaps not be used.

The experience shown in our charts represents the results developed for the mortality tables of 1994. The task force had experience of a credible variety from the retirement experience committee on the group annuity side, that was contributed by up to 11 companies for calendar years 1986–90. The Experience Committee annually collects experience of this type. But when our task force was preparing this particular report, the most recent credible experience that we had available was for calendar year 1990. At this point in time, there might be some credible experience for 1991, but it would not appreciably change the results that we're presenting here.

Anyway, that particular experience produced a core table for 1988, with q_x 's determined for ages 65–95. However, we only used the age 66 and above q_x 's, noting that the core rate for age 65 initially came from this retired experience.

The insurance companies have not yet collected active data, so we went to another source for that information, primarily the Civil Service Retirement System (CSRS). The people at CSRS gave us active information for ages 25–65 with some early retirement information supplemented for the ages 50–70. In comparing the age 65–70 rates with the group annuity experience, you can see that (the comparison is on page 12 in Table 4 of the draft report I mentioned to you) the ratios were almost one. So we felt comfortable stating that we could merge the insured experience of the group annuity business, into the CSRS experience for central year 1988 and have a continuous table that looked reasonable.

After this analysis, we modified the CSRS rates for the early retirement years, and appended the table to the age 66–95 rates and produced a 1988 core table from age 25–95. After that, we had to add to the tables rates for ages below 25 and ages above 95, which is where the group annuity experience, as well as the CSRS experience, started losing a little bit of its credibility.

First, at the lower end, ages 1–25, we took a look at the Social Security Administration's projections in Actuarial Study Number 107. It reflected experience through calendar year 1988, with projections into central years 1990, 2000 and thereafter. We took the experience for the 1990 central year that the Social Security Administration produced, and we developed an algorithm to reproduce the CSRS rate at 25 and the Social Security rate at age 12, which is approximately halfway between the two endpoints of 0 and 25. After that we did a little bit of interpolation to bring the results into line at ages down to and including an age 1 q_x . The results are shown in Table 6 on page 16 of the draft report, both before and after adjustment.

Next, we worked on the rates for ages above 95. As I have already stated, the group annuity, as well as the CSRS data, were not quite as credible for these upper limit ages. So we started looking closely at the Social Security records trying to figure out what the ultimate age would be, if nothing else. We eventually decided to use 115 as the ultimate age.

In addition to using 115 as the ultimate age, we decided upon an ultimate rate of 50% mortality. Most tables, as you are well aware, close the table at an ultimate rate of 1. We have since seen studies done by Bayo, Faber, and others that have shown that this ultimate result may not be quite right. Even some of the insurance

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company data, while not quite credible, indicate that there is some kind of conversion between maybe a 28% and 45% ultimate rate. For conservatism we used 50%, and we ended the value at that 50% rate.

To illustrate this, if you would look at the tables in the report, specifically Table 8 on page 19, you'll see that the ultimate rate of 50% starts at age 100 for males and age 109 for females. We arbitrarily stopped the table at age 115 with this ultimate rate. Studies that we've done with some calculations have produced annuity rates for ages 95 and below, done in the generally standard way where if you discount future mortality streams, they do not appreciably change using an ultimate age of 115 or 120, even if the table is capped at 100% with a limiting age of let's say 116.

As a result, we have a base set of rates for calendar year 1988. But we're developing a 1994 GAM table, and so we had to project that information from 1988 to 1994. Here again, the CSRS experience, which to say the least, incorporated a lot of lives, gave us information that we used for calendar years 1986-93. We compared that to other information, as shown in Table 9 on page 21, from the Social Security Administration, Society of Actuaries experience from 1985 to 1990, and other items such as Scale H, which was produced with the 1983 Interim Standard. We felt most comfortable with the CSRS experience for 1986-92, and we upgraded that to one year later as shown in Table 10 of the draft report on pages 23-26. The second column of that Table 10, labeled GAM 1988-94, is what eventually resulted in our mortality projection of the core 1988 table to calendar year 1994.

Some interesting things occurred in those six years, if you might look at that table. We had some negative mortality improvement factors for males, between the ages of 26 and 32. Also some negative improvement experience for females is shown between the ages of 60 and 65. To determine the final female improvement experience for the early 60s, given the group annuity experience we received from insurance companies showing no reduction in mortality during this period, we decided that it be kept at zero. We wanted to reflect actual mortality experience between that 1988 core year and 1994 valuation year that we are producing in Table 11.

Thus, the result is that we have produced a table, projected it, but we did not graduate it to 1994. The next step was to graduate that table. We did so with a four-point Karup-King formula, shown on page 28, and that produced what we will be calling the 1994 GAM Basic Table.

Table 1 shows the q_x rates for the 1994 GAM Basic table, which will also be used as the UP 1994 mortality table, ages 1-30, ages 31-60, ages 61-90, and finally, 91-115. There was some smoothing at the upper limit ages. Also, you will notice, in our base table 1988, ages 107 and 108 were the last ages before the ultimate rate of 50%. These ages have increased to age 112, for both the males and the females.

The GAR table, as I've already stated, is going to be used primarily for evaluating GARs of insurance companies. The UP 1994 table will be used, if it's treated as an update to the UP 1984 table, for funding purposes and others uses of that sort. The draft report will be moving the discussion in the direction of treating the GAR as a reserving table. The report on the UP 1994 will discuss UP 1994 table and its implications, and a third report will discuss the differences between the two tables.

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Nevertheless, this particular base table, without margins, is going to be used, I presume, in very many places.

TABLE 1
1994 GROUP ANNUITY MORTALITY BASIC TABLE
GRADUATED—NO MARGIN 1994 BASE YEAR

Age	Male	Female	Age	Male	Female
1	.000637	.000571	16	.000421	.000261
2	.000430	.000372	17	.000463	.000281
3	.000357	.000278	18	.000495	.000293
4	.000278	.000208	19	.000521	.000301
5	.000255	.000188	20	.000545	.000305
6	.000244	.000176	21	.000570	.000308
7	.000234	.000165	22	.000598	.000311
8	.000216	.000147	23	.000633	.000313
9	.000209	.000140	24	.000671	.000313
10	.000212	.000141	25	.000711	.000313
11	.000223	.000148	26	.000749	.000316
12	.000243	.000159	27	.000782	.000324
13	.000275	.000177	28	.000811	.000338
14	.000320	.000203	29	.000838	.000356
15	.000371	.000233	30	.000862	.000377
31	.000883	.000401	46	.001852	.001111
32	.000902	.000427	47	.002042	.001196
33	.000912	.000454	48	.002260	.001297
34	.000913	.000482	49	.002501	.001408
35	.000915	.000514	50	.002773	.001536
36	.000927	.000550	51	.003088	.001686
37	.000958	.000593	52	.003455	.001864
38	.001010	.000643	53	.003854	.002051
39	.001075	.000701	54	.004278	.002241
40	.001153	.000763	55	.004758	.002466
41	.001243	.000826	56	.005322	.002755
42	.001346	.000888	57	.006001	.003139
43	.001454	.000943	58	.006774	.003612
44	.001568	.000992	59	.007623	.004154
45	.001697	.001046	60	.008576	.004773
61	.009863	.005476	76	.043933	.027231
62	.010911	.006271	77	.048570	.030501
63	.012335	.007179	78	.053991	.034115
64	.013914	.008194	79	.060066	.038024
65	.015629	.009286	80	.066696	.042361
66	.017462	.010423	81	.073780	.047260
67	.019391	.011574	82	.081217	.052853
68	.021354	.012648	83	.088721	.058986
69	.023364	.013665	84	.096358	.065569
70	.025516	.014763	85	.104559	.072836
71	.027905	.016079	86	.113755	.081018
72	.030625	.017748	87	.124377	.090348
73	.033549	.019724	88	.136537	.100882
74	.036614	.021915	89	.149949	.112467
75	.040012	.024393	90	.164442	.125016
91	.179849	.138442	106	.460043	.438126
92	.196001	.152660	107	.475200	.456824
93	.213325	.167668	108	.485670	.471493
94	.231936	.183524	109	.492807	.483473
95	.251189	.200229	110	.497189	.492436
96	.270441	.217783	111	.499394	.498054
97	.289048	.236188	112	.500000	.500000
98	.306750	.255605	113	.500000	.500000
99	.323976	.276035	114	.500000	.500000
100	.341116	.297233	115	.500000	.500000
101	.358560	.318956			
102	.376699	.340960			
103	.396884	.364586			
104	.418855	.389996			
105	.440585	.415180			

Now that we have produced a table for 1994, the question is, how will we project mortality after the year 1994? Again, we looked at the CSRS experience, as well as

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the Social Security Administration experience. Table 13, which is found on pages 31–34 of the draft report, shows experience for calendar years 1977–93. Social Security data did not quite go that far, I think the data only went to 1989 or 1990 from what I recall of what we finally used. And the data were projected from that point with a linear interpolation formula to 1993, using the CSRS experience. After we averaged it out, we kept as a minimum rate, 50%. Or, I should say, 0.5 of a percent of improvement from one year to the next. In part, the reason was that we felt we could not emphatically state, in part supported, if you look at some of these rates shown on Table 13. Nor did we confidently feel that the negative rates we were showing between those limited periods of years or where zero rates were indicated, would be appropriate for future mortality increases. We have yet to see anything that indicates mortality does not continue to improve. We believe that it still does. So we kept as a minimum rate, 0.5 of a percent.

From one age to the next, when we looked at this particular set of improvement factors, we modified them such that they did not have an increase of more than 0.1 of a percent from one age to the next. As an example, you could have a situation where at age, let's say, 45, I'm not sure where the actual rates are, and age 46 where the mortality improvement factor at age 46, by the experience, was indicated to improve more rapidly than at age 45. A few years down the road, if there was too much of an increase relative to the previous rate, the rates would overlap, and you'd start having a mortality table doing flip-flops. To minimize that possibility, we limited the increase from one age to the next to that 0.1 of a percent. The ultimate mortality projection rates for post-1994 mortality, that we then came up with, are shown on Table 14, on pages 37 and 38 of the draft report.

These are the scale AA improvement factors for ages 1–30, male and female (Table 2). Also, note ages from 31 through 60, 61–90, and 91–115. I'll repeat again, that the UP 1994 subcommittee has already adopted that 1994 Basic Table I have shown you. The members are right now also inclined to agree that this Scale AA is the most reasonable projection scale that we can come up with at this point for projecting mortality after the year 1994.

However, the UP 1994 subcommittee has not yet decided whether it will or will not incorporate generational mortality in the table projection and forecasts. Its members have also not come up with the multiple tables to which they'll be comparing the UP 1994 table. An example is police and firefighter mortality, which theoretically is less severe from the general population of group annuitants, versus disabled retiree mortality versus blue-collar-type mortality, etc. The GAR table, however, will be using this scale AA in its future projections.

Now, it might be worthwhile to see the graphs of the Projection Scale AA. Here are the two graphs (Charts 1 and 2). If you notice, the graphs are not quite as smooth as previous projection scales, in part, because we're using an age-by-age projection increase. But it does have that minimum of 0.5% improvement at the younger ages. At the older ages we did feel that mortality would not necessarily improve. Also, the female scale AA obviously is quite different from the male pattern. Both however, if you notice display a reduction in improvement in the early adult years, meaning 25–45. Let's go back to the male again to compare. Then there is an increase in the middle ages. However, that could relate to the experience that we had as well.

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Finally, there is a further reduction in mortality improvement as the scales move to the upper ages.

TABLE 2
 PROJECTION SCALE AA
 MORTALITY IMPROVEMENT FACTORS
 TO BE USED IN THE NEW TABLE
 WHEN PROJECTING MORTALITY RATES BEYOND 1994

Age	Male	Female	Age	Male	Female
1	2.0	2.0	16	1.9	1.5
2	2.0	2.0	17	1.9	1.4
3	2.0	2.0	18	1.9	1.4
4	2.0	2.0	19	1.9	1.5
5	2.0	2.0	20	1.9	1.6
6	2.0	2.0	21	1.8	1.7
7	2.0	2.0	22	1.7	1.7
8	2.0	2.0	23	1.5	1.6
9	2.0	2.0	24	1.3	1.5
10	2.0	2.0	25	1.0	1.4
11	2.0	2.0	26	0.6	1.2
12	2.0	2.0	27	0.5	1.2
13	2.0	2.0	28	0.5	1.2
14	1.9	1.8	29	0.5	1.2
15	1.9	1.6	30	0.5	1.0
31	0.5	0.8	46	1.4	1.7
32	0.5	0.8	47	1.5	1.8
33	0.5	0.9	48	1.6	1.8
34	0.5	1.0	49	1.7	1.8
35	0.5	1.1	50	1.8	1.7
36	0.5	1.2	51	1.9	1.6
37	0.5	1.3	52	2.0	1.4
38	0.6	1.4	53	2.0	1.2
39	0.7	1.5	54	2.0	1.0
40	0.8	1.5	55	1.9	0.8
41	0.9	1.5	56	1.8	0.6
42	1.0	1.5	57	1.7	0.5
43	1.1	1.5	58	1.6	0.5
44	1.2	1.5	59	1.6	0.5
45	1.3	1.6	60	1.6	0.5
61	1.5	0.5	76	1.4	0.8
62	1.5	0.5	77	1.3	0.7
63	1.4	0.5	78	1.2	0.7
64	1.4	0.5	79	1.1	0.7
65	1.4	0.5	80	1.0	0.7
66	1.3	0.5	81	0.9	0.7
67	1.3	0.5	82	0.8	0.7
68	1.4	0.5	83	0.8	0.7
69	1.4	0.5	84	0.7	0.7
70	1.5	0.5	85	0.7	0.6
71	1.5	0.6	86	0.7	0.5
72	1.5	0.6	87	0.6	0.4
73	1.5	0.7	88	0.5	0.4
74	1.5	0.7	89	0.5	0.3
75	1.4	0.8	90	0.4	0.3
91	0.3	0.3	106	0.0	0.0
92	0.2	0.3	107	0.0	0.0
93	0.1	0.2	108	0.0	0.0
94	0.1	0.2	109	0.0	0.0
95	0.1	0.1	110	0.0	0.0
96	0.0	0.0	111	0.0	0.0
97	0.0	0.0	112	0.0	0.0
98	0.0	0.0	113	0.0	0.0
99	0.0	0.0	114	0.0	0.0
100	0.0	0.0	115	0.0	0.0
101	0.0	0.0			
102	0.0	0.0			
103	0.0	0.0			
104	0.0	0.0			
105	0.0	0.0			

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CHART 1
MORTALITY IMPROVEMENT FACTORS
MALE SCALE AA

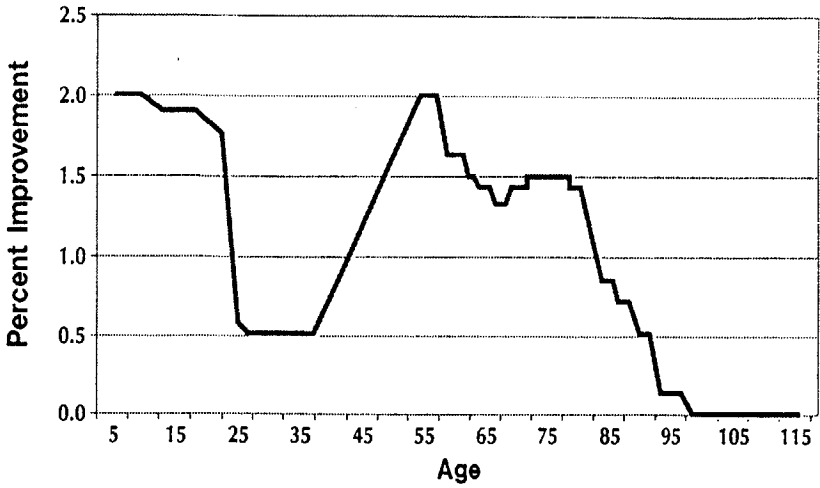
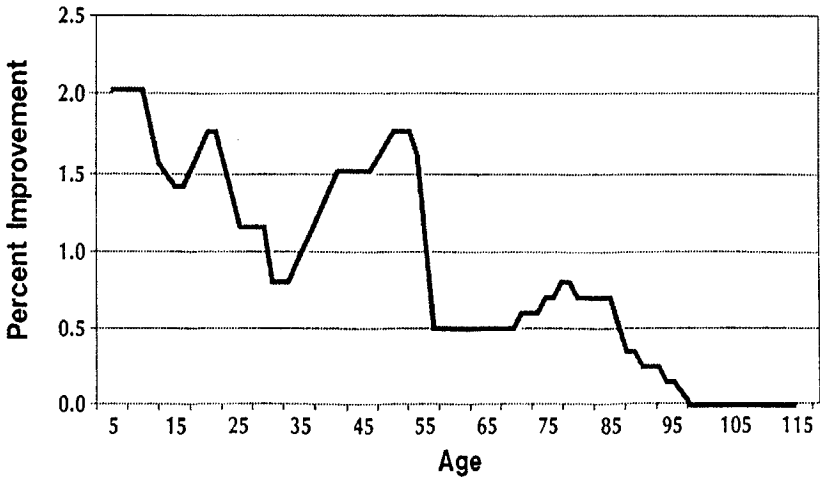


CHART 2
MORTALITY IMPROVEMENT FACTORS
FEMALE SCALE AA



Now that we've produced a projection scale, for post-1994 mortality improvements, we had to take a look at what would be appropriate for actually determining GARs of insurance companies. One thing that we do know about GARs is that from one company to the next, the companies do not necessarily have the same block of business to hold reserves for. We found various differences in all 11 companies that contributed to the data.

Accordingly, margins are necessary for an annuity reserve table when it is to be used for developing GARs in insurance companies. The margin that we finally added to the GAM Basic table, in order to come up with a GAR process, amounted to 7%. A 5% margin implicitly resulted from other factors such as different blocks of business, blue collar versus white collar experience, or other basic variations in mortality rates, while the 2% additional was added for factors that could not be quantified.

Before I get into a further discussion about these factors, in pages 39–42 of the draft report and on pages 43–44, we have some tables. We show how we actually developed the two standard deviation values used to determine that initial 5% margin added to the basic table rates. This amount takes into account the difference in mortality rates throughout the various populations.

In Tables 15 and 16 of the report, 5% is a reasonable core rate for both the males and the females. Now while we're showing this at 6%, if we used 5% or 7% or some other rates, the numbers would not change appreciably. The next page of the draft report discusses the other factors that would impact the margin that we just discussed. When it's all said and done, the 7% margin, when added to the 1994 Basic Table produced what we're now calling the 1994 GAM Static table. The results are shown in these next set of rates. Our Table 3 shows ages 1–30, 31–60, 61–90, and finally, 91–115 of the GAM Static table. We did not reduce the 50% rate at the older ages below 50%, and we will not do so in the future when we project mortality rates.

At this point, we now have a GAM table that's reduced with the margins and shows a standard type of mortality curve. The following charts graphically show this. First, there's a general mortality curve (Chart 3) as you see, low at the earlier ages, increasing rapidly, and then being asymptotic to the 50% of the upper ages. We've broken this graph table down to three parts, in order to show you the different curves at the ages both male and female, 1–40 (Chart 4), 40–70 (Chart 5), and then 70–115 (Chart 6).

Now what does this all give us? We have a static table, a projection scale AA, and we've already stated that we're going to be producing a GAR in process.

Generational mortality is not necessarily an easy topic to bring across and understand. If you turn to page 49 of the draft report, realize that generational mortality reflects improving mortality rates taken down the diagonal. To show this requires that we take a given age as an example, and the age we're showing on page 49, Table 18, is age 65. The improvement of mortality from one year to the next, at each successive age, is shown as one moves down that diagonal to determine the actual q_x values to be used in determining the mortality rates and in determining an annuity present value.

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TABLE 3
1994 GAM STATIC MORTALITY TABLE
1994 BASE YEAR VALUES OF q_x

Age	Male	Female	Age	Male	Female
1	.000592	.000531	16	.000391	.000242
2	.000400	.000346	17	.000430	.000262
3	.000332	.000258	18	.000460	.000273
4	.000259	.000194	19	.000484	.000280
5	.000237	.000175	20	.000507	.000284
6	.000227	.000163	21	.000530	.000286
7	.000217	.000153	22	.000556	.000289
8	.000201	.000137	23	.000589	.000292
9	.000194	.000130	24	.000624	.000291
10	.000197	.000131	25	.000661	.000291
11	.000208	.000138	26	.000696	.000294
12	.000226	.000148	27	.000727	.000302
13	.000255	.000164	28	.000754	.000314
14	.000297	.000189	29	.000779	.000331
15	.000345	.000216	30	.000801	.000351
31	.000821	.000373	46	.001722	.001033
32	.000839	.000397	47	.001899	.001112
33	.000848	.000422	48	.002102	.001206
34	.000849	.000449	49	.002326	.001310
35	.000851	.000478	50	.002579	.001428
36	.000862	.000512	51	.002872	.001568
37	.000891	.000551	52	.003213	.001734
38	.000939	.000598	53	.003584	.001907
39	.000999	.000652	54	.003979	.002084
40	.001072	.000709	55	.004425	.002284
41	.001156	.000768	56	.004949	.002563
42	.001252	.000825	57	.005581	.002919
43	.001352	.000877	58	.006300	.003359
44	.001458	.000923	59	.007090	.003863
45	.001578	.000973	60	.007976	.004439
61	.008986	.005093	76	.040858	.025325
62	.010147	.005832	77	.045171	.028366
63	.011471	.006677	78	.050211	.031727
64	.012940	.007621	79	.055861	.035362
65	.014535	.008636	80	.062027	.039396
66	.016239	.009694	81	.068615	.043952
67	.018034	.010764	82	.075532	.049153
68	.019859	.011763	83	.082510	.054857
69	.021729	.012709	84	.089613	.060979
70	.023730	.013730	85	.097240	.067738
71	.025951	.014953	86	.105792	.075347
72	.028481	.016506	87	.115671	.084023
73	.031201	.018344	88	.126980	.093820
74	.034051	.020381	89	.139452	.104594
75	.037211	.022686	90	.152931	.116265
91	.167260	.128751	106	.425599	.405217
92	.182281	.141973	107	.441935	.424846
93	.198392	.155931	108	.457553	.444368
94	.215700	.170677	109	.473150	.464469
95	.233606	.186213	110	.486745	.482325
96	.251510	.202538	111	.496356	.495110
97	.268815	.219655	112	.500000	.500000
98	.285277	.237713	113	.500000	.500000
99	.301298	.256712	114	.500000	.500000
100	.317238	.276427	115	.500000	.500000
101	.333461	.296629			
102	.350330	.317093			
103	.368542	.338505			
104	.387855	.361016			
105	.407224	.383597			

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CHART 3
1994 GAM STATIC TABLE RATES
1994 BASE YEAR AGES 1-115

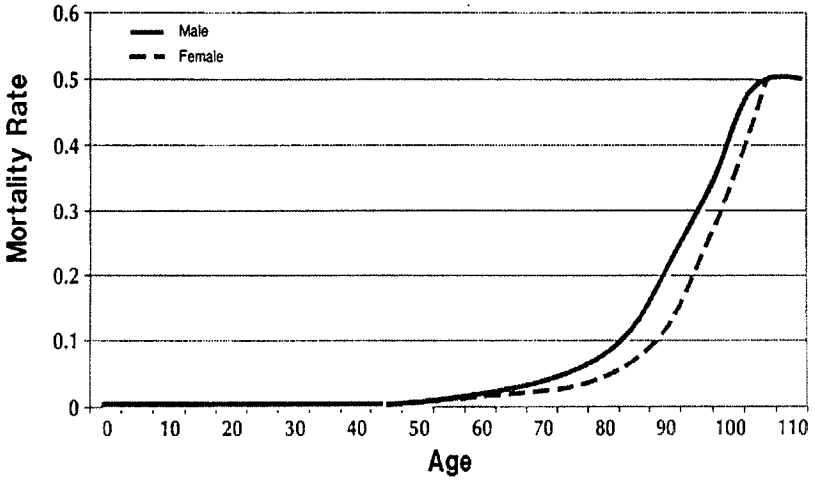
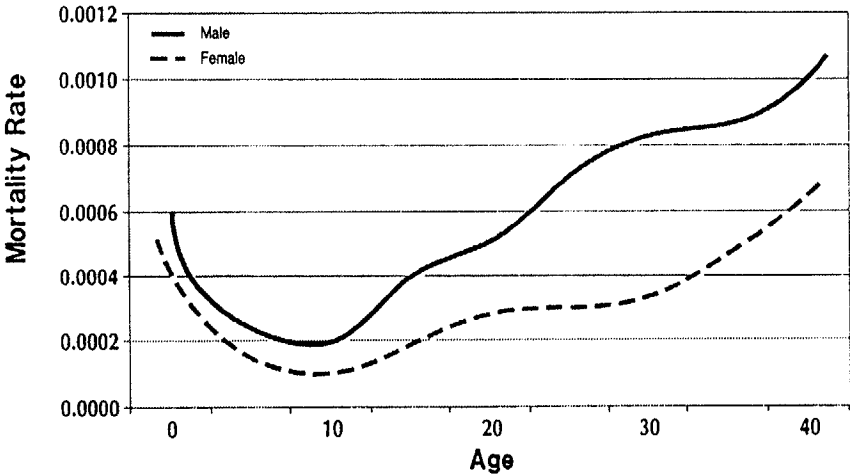


CHART 4
1994 GAM STATIC TABLE RATES
1994 BASE YEAR AGES 1-40



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CHART 5
1994 GAM STATIC TABLE RATES
1994 BASE YEAR AGES 40-70

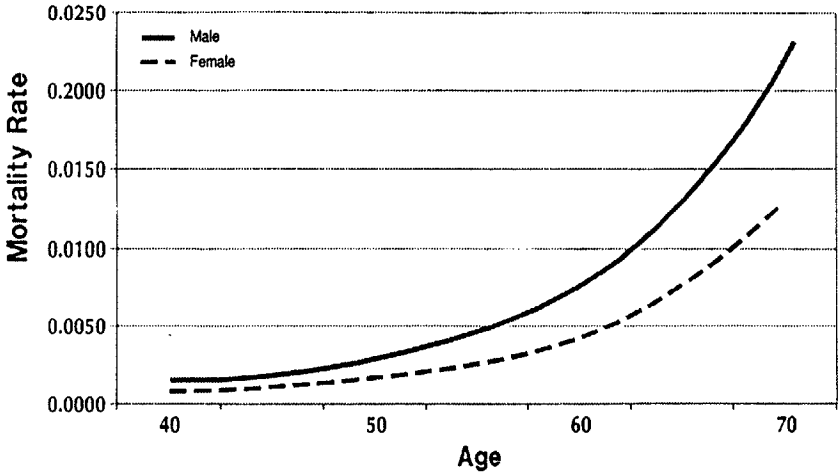
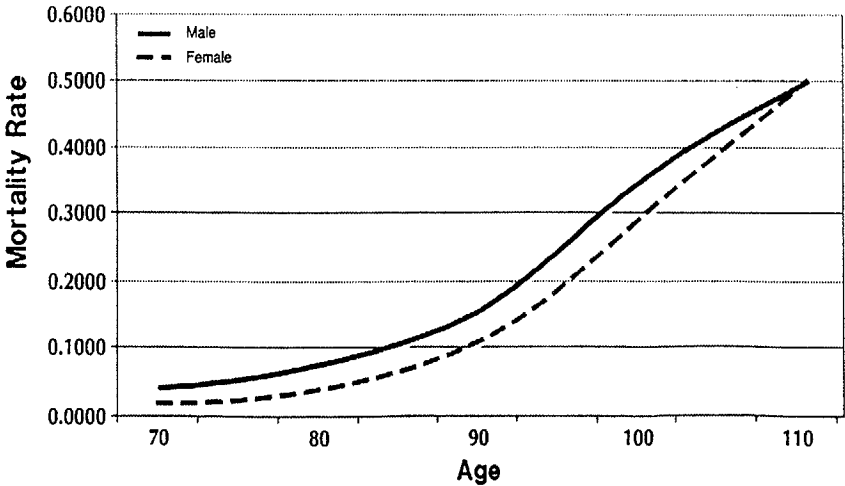


CHART 6
1994 GAM STATIC TABLE RATES
1994 BASE YEAR AGES 70-115



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The next two tables are samples of generational mortality table rates. The rates are for a male age 65 at the years indicated: 1994, 1999, 2004, 2009 (Tables 4 and 5). The formula that we spoke about on page 51 of the report reproduces each of these values. As an example, take a look at the age 70 male rate in the year 1999. Seventy is 5 years, that is, 70 less 65 is the n in that equation, which is 5. The year 1999 less 1994 is the t in that equation, which is also 5. So the rate of 20.401 should represent the AA factor at age 70, raised to the tenth power. And if you look at Table 17 in the report and multiply the projection scale projection by the age-70 rate increased to the tenth power, you will reproduce, I hope, the 20.401. Each of those four tables will not have gone to the end of the table, so that it does not fully represent a generational process for the GAR table.

TABLE 4
 GENERATION MORTALITY RATES PER 1,000
 FOR ISSUES OF 1994, 1999, 2004, AND 2009
 BASED UPON 1994 GAM STATIC TABLE
 WITH FULL GENERATION AND PROJECTION SCALE AA

Age	Male Issue Age 65 in the Year			
	1994	1999	2004	2009
65	14.535	13.546	12.624	11.764
66	16.028	15.013	14.062	13.171
67	17.568	16.456	15.413	14.437
68	19.037	17.741	16.533	15.408
69	20.537	19.140	17.837	16.623
70	22.003	20.401	18.917	17.540
71	23.702	21.977	20.377	18.894
72	25.622	23.757	22.028	20.425
73	27.648	25.635	23.770	22.040
74	29.720	27.557	25.552	23.692
75	32.318	30.118	28.068	26.157
76	34.988	32.607	30.387	28.319
77	38.607	36.162	33.872	31.727
78	42.918	40.404	38.037	35.809
79	47.847	45.273	42.837	40.532
80	53.347	50.732	48.246	45.881

I've already alluded to GAR at least three times, maybe four. We're using GAR to distinguish this approach for the reserving factor formula versus the standard static-type tables that have a projection scale associated with them, but not necessarily incorporated into the process. The 1994 GAR is specifically intended, as our recommendation at least, to use the 1994 GAM Static Table with Projection Scale AA, in a generational process such as we've shown here for the males and females at issue age 65.

Other projection scales might come into play in the future. Certainly, future experience will shift somewhat from what we're showing here. But we anticipate that by using a projection method of this sort, we hope reserves could last for possibly 15

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years or more. The hope is that, at the very least, if not accurate, these reserves provide a more reasonable result and allocation of what a minimum reserve should be.

TABLE 5
GENERATION MORTALITY RATES PER 1,000
FOR ISSUES OF 1994, 1999, 2004, AND 2009
BASED UPON 1994 GAM STATIC TABLE
WITH FULL GENERATION AND PROJECTION SCALE AA

Age	Female Issue Age 65 in the Year			
	1994	1999	2004	2009
65	8.636	8.422	8.214	8.010
66	9.646	9.407	9.174	8.947
67	10.657	10.393	10.136	9.885
68	11.587	11.301	11.021	10.748
69	12.457	12.148	12.736	11.554
70	13.390	13.059	12.736	12.410
71	14.423	13.995	13.581	13.178
72	15.825	15.356	14.901	14.459
73	17.342	16.743	16.165	15.607
74	19.132	18.472	17.835	17.219
75	20.935	20.111	19.319	18.559
76	23.183	22.271	21.394	20.552
77	26.073	25.173	21.304	23.465
78	28.958	27.959	26.994	26.062
79	32.050	30.944	29.876	28.845
80	35.456	34.232	33.051	31.910

We've also prepared some financial values with the GAR table and have compared them to the GAM 1983, which we're recommending that it replace. These are values of due annuities for males at various quinquennial age groups, and at given issue years of 1994, 1999, 2004, 2009 (Table 6). As you'll notice in the 1994 column, the younger ages did not show much of a shift, but they do increase to approximately 5–8% in the key retirement years, and move back down again at the older ages. As you move out to valuation year 2009, which we might now recall with our formula, it has 15 years worth of mortality improvement in the base q_x rates, as well as the projection from that point forward. The results still show relatively small ratios at the younger ages, but again increase to between 7% and 13% at the key retirement years and down to almost nothing again at the older ages.

Female rates are not quite as dramatic, but nevertheless, do show the same general process. They start out at a very small increase, ratiowise, to approximately 1–2% at the key retirement years in 1994 (Table 7). Looking at 2009, again, the rates increase up to about 3–5% for the key retirement years. Now one of my task force members was very nice to me, and he gave me some additional factors at interest rates of 2% and 12% to show you how these ratios might change. Let me stick with the males. First we go to a 2% interest rate looking at the ratios at age 25 and 30 of 1.2 and 1.7, respectively. At 2%, they are increased to 6.5–7.1%, moving to a maximum of 11% at 75, as opposed to the 8.5% shown at 6%. In the year

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2009, at 2% that 1.2 ratio moves to 7.1 at age 20. It's a maximum of 18% at age 75, as opposed to the 14% we're showing at 6%. At 12%, these ratios are obviously going to be less than the 6% rates, and they now go back down to 1/100th or 1.001 at age 20 in 1994, to a maximum of 7.2, as opposed to the 8.6 shown for 6%. The ultimate rate is 11.5% in the year 2009. Again, the females will show a similar shift and a similar set of ratios, but on a lower scale.

TABLE 6
LIFE ANNUITY NET SINGLE PREMIUMS
VALUES OF $\ddot{a}_x^{(12)}$
ASSUMING 7% LEVEL INTEREST RATE AND MORTALITY FROM 1994
GROUP ANNUITY RESERVING TABLE VERSUS MORTALITY
FROM 1983 GAM STATIC TABLE

Male Issue Age	(1)	(2) 1994		(4) 1999		(6) 2004		(8) 2009	
	GAM83	GAR94	(2)/(1)	GAR94	(4)/(1)	GAR94	(6)/(1)	GAR94	(8)/(1)
20	14.334	14.462	1.009	14.476	1.010	14.489	1.011	14.501	1.012
25	14.169	14.345	1.012	14.362	1.014	14.377	1.015	14.392	1.016
30	13.947	14.189	1.017	14.211	1.019	14.233	1.021	14.253	1.022
35	13.649	13.969	1.023	14.001	1.026	14.031	1.028	14.059	1.030
40	13.252	13.652	1.030	13.697	1.034	13.739	1.037	13.780	1.040
45	12.737	13.213	1.037	13.276	1.042	13.334	1.047	13.390	1.051
50	12.099	12.623	1.043	12.705	1.050	12.783	1.057	12.856	1.063
55	11.329	11.859	1.047	11.959	1.056	12.055	1.064	12.146	1.072
60	10.380	10.911	1.051	11.030	1.063	11.144	1.074	11.253	1.084
65	9.242	9.810	1.061	9.945	1.076	10.074	1.090	10.199	1.104
70	8.006	8.609	1.075	8.751	1.093	8.889	1.110	9.022	1.127
75	6.729	7.300	1.085	7.427	1.104	7.550	1.122	7.670	1.140
80	5.480	5.951	1.086	6.045	1.103	6.137	1.120	6.228	1.136
85	4.401	4.726	1.074	4.789	1.088	4.851	1.102	4.912	1.116
90	3.493	3.600	1.031	3.625	1.038	3.649	1.045	3.674	1.052
95	2.723	2.718	.998	2.721	.999	2.724	1.000	2.727	1.001

Finally, when all is said and done, we anticipate this recommendation will be made first to the Society of Actuaries, after it goes through a Research Committee review and is reviewed by other individuals who are interested. It will be incorporated with UP 1994 table release and the third paper that would discuss the differences between the tables. We hope to propose to the NAIC and others that this standard will become law and replace the 1983 Interim.

You can see by these rates that the GAM 1983 table rates, at this point, are out of date. Again, this draft report discusses a GAR table, primarily intended for use in developing minimum reserves of group annuity business. The UP 1994 table is to be used for funding and other processes of that sort. Other potential uses that might be appropriate or further aided by the results that we're seeing in these particular tables would be discussed and compared in the third paper that I mentioned before. I hope all of these reports will be released later in 1994, as an exposure report. Further discussion will produce a final report in, I hope, early 1995 at the latest.

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TABLE 7
LIFE ANNUITY NET SINGLE PREMIUMS
VALUES OF $\ddot{a}_x^{(12)}$
ASSUMING 7% LEVEL INTEREST RATE AND MORTALITY FROM 1994
GROUP ANNUITY RESERVING TABLE VERSUS MORTALITY
FROM 1983 GAM STATIC TABLE

Female Issue Age	(1)	(2) 1994		(4) 1999		(6) 2004		(8) 2009	
	GAM83	GAR94	(2)/(1)	GAR94	(4)/(1)	GAR94	(6)/(1)	GAR94	(8)/(1)
20	14.550	14.552	1.003	14.560	1.003	14.567	1.004	14.574	1.004
25	14.400	14.456	1.004	14.465	1.005	14.474	1.005	14.483	1.006
30	14.253	14.320	1.005	14.332	1.006	14.344	1.006	14.355	1.007
35	14.054	14.132	1.006	14.148	1.007	14.164	1.008	14.179	1.009
40	13.786	13.876	1.007	13.897	1.008	13.917	1.010	13.936	1.011
45	13.430	13.531	1.008	13.557	1.009	13.582	1.011	13.606	1.013
50	12.964	13.065	1.008	13.095	1.010	13.124	1.012	13.152	1.015
55	12.359	12.448	1.007	12.483	1.010	12.516	1.013	12.550	1.015
60	11.586	11.656	1.006	11.699	1.010	11.742	1.013	11.785	1.017
65	10.623	10.708	1.008	10.762	1.013	10.815	1.018	10.868	1.023
70	9.451	9.619	1.018	9.685	1.025	9.749	1.032	9.812	1.038
75	8.131	8.328	1.024	8.401	1.133	8.472	1.042	8.541	1.050
80	6.795	6.922	1.019	6.988	1.028	7.054	1.038	7.118	1.048
85	5.505	5.508	1.001	5.553	1.009	5.599	1.017	5.644	1.025
90	4.252	4.204	.989	4.229	.995	4.254	1.000	4.279	1.006
95	3.103	3.153	1.016	3.156	1.017	3.159	1.018	3.162	1.019

MR. DONALD A. JONES: I compliment you on your work, and I want to talk to Lindsay about the mortality study. It's a good report, and a lot of work on the part of the task force. There's one little part in moving from the difference between UP 1994 and GAM 1994; I think that's where you added the margins on to the rates.

MR. MALKIEWICH: That is correct.

MR. JONES: And there's a good development in there about the standard deviations that are generated by the random fluctuations and the future lifetime random variables for those annuities. There is also some discussion there, where it sounded like you were trying to estimate the variation between companies, because they write different businesses, and so you put that margin into the table. Those two variations are different: the type of mortality that's underwritten and the variation on the random fluctuation in the future lifetime random variable. I'm a little distressed to see a margin put back in that table. I would prefer to see a margin for that random fluctuation on the future lifetime random variable, added on to the mean, so we knew how much was put there, rather than hidden in the mortality table. I think we're trying to move in that direction these days. I know you're too far along to back out of something like that, but the way you generated that margin, I don't think it should be added into the table.

MR. MALKIEWICH: You're addressing the development of the 5% or the 2%, Don?

MR. JONES: I can't remember all the numbers, Lindsay. It's the movement from the table that you made. I'm not talking about the projection; I'm just talking about the Basic table when you added the margins in that were based on and were built on one

idea. I think they were trying to cover a different idea. I think it's the way we've been doing it in the past.

MR. MALKIEWICH: Unfortunately, as Don stated, it is probably too late to modify it. But certainly, in the discussion of the paper, we'll be addressing an issue such as the one that has just been raised. To give a quick review of what Don is referring to, we added a 5% margin that related to two standard deviations of a typical 3,000-life group to reflect covering 95% of the inborn mortality fluctuations, because of the different business generally written, and just general fluctuation of rates across various industry. An additional 2% was added since we felt it was necessary to cover additional experience such as blue collar versus white collar, high income versus low income, and the like. And Don is saying that maybe we should not have addressed both of those pieces in the additional margin grouping. That is a question of supposition, unfortunately, our task force felt that the 7% was appropriate. It certainly can be discussed and agreed upon that we can disagree on what that proper level should or should not be.

MR. RONALD GEBHARDTSBAUER: Is Table 18 of the draft report the picture of the generational table? You're going diagonally then down one of those lines when you calculate the present value of annuity. My question is, I guess you used your Scale AA?

MR. MALKIEWICH: That is correct.

MR. GEBHARDTSBAUER: It's not like selection only, you have it going out all the way?

MR. MALKIEWICH: That is correct.

MR. GEBHARDTSBAUER: Here to the year 2054? So did you think that's appropriate to have the same improvement every year for the next 60 years or did you discuss that issue?

MR. MALKIEWICH: All right. Ron Gebhardtsbauer is asking whether the task force addressed the issue of whether future mortality improvements should remain constant from 1994 on. Or, do we feel that mortality improvement would modify in the future? We believe the answer is, yes, mortality improvement will probably modify in the future. We stated in our report that we hoped that this particular approach would last at least 15 years. We think that for determining minimum reserves of this type, that for the next 15 years, keeping that projection scale constant probably would not understate the mortality. It certainly gives a better statement of what the minimum reserve would be if no projection of mortality improvement been incorporated at all.

In the past, you can notice changes have occurred. Here we are today, and we're producing a 1994 table following a 1983 Interim Table, which was produced based on data in the 1971 GAM. We've already noticed in just the 23 years between 1971 and 1994 that there has been a lot of mortality improvement. We wanted to bring into play the idea that mortality will continue to improve, and incorporate that into the valuation process. We believe we have done that with this particular approach. Yes, mortality improvement might modify and probably will modify in

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future years. You're correct, Ron, that as we go down the road, this Scale AA will be less and less linked with actual experience. But, we anticipate that the Group Annuity Experience Committee and others will, on an ongoing basis, monitor this process.

MR. MICHAEL M.C. SZE: Don raised a very important point, that is, that some people may not want to see the projection or any margin in mortality tables. It might be useful to point out that there are two tables that will be produced. The 1994 GAM or GAR would have the margin. But there's another table, UP 1994 that would not have the margin. And it also will not have the static table as far as the projection is concerned. So, maybe Lindsay can clarify that a little bit more.

MR. MALKIEWICH: Yes, as I mentioned, our initial Table 12, which was Table 1 of this presentation, was the graduated 1994 or what we're calling the Basic table. That 1994 Basic table is going to be used by the UP 1994 subcommittee as its UP 1994 table as well. That table does not have a margin built into it. We do believe, however, that mortality will probably improve in the future, and so more than likely, the UP subcommittee will release the scale AA as part of a recommended guideline, you might say, for future mortality improvement, But it certainly will not necessarily, or by definition, be incorporated in UP 1994 projections or funding calculations.

We feel that projection is appropriate when used for determining minimum reserves. An annual reserve process cannot be modified from one year to the next. It follows regulations and laws; whereas when you're funding a pension plan and performing other related tasks of that sort, you take a look at your funding process and your mortality table on the year-by-year basis. You're supposed to make your best estimate of what mortality is to be. And we feel that the individual actuary should have leeway to incorporate or to not incorporate mortality projection as he or she sees fit. And so, it is by a very specific design that the UP 1994 process and the 1994 GAR process go in a different direction for the different needs.

MR. GERARD C. MINGIONE: As a pension practitioner, I probably am getting from your discussion, that we're going to be most likely picking up the UP version without the margins. Yet, when you showed the tables and charts earlier, I notice that at the key retirement ages for the male annuity rates were going up about 4-6% and the females were going up about 1-2%. Am I to read from that that without margins, the increase would be much lower, versus 1983 GAM, or maybe even nonexistent? Do you have a feel for that?

MR. MALKIEWICH: In answer to your question, the female rates for the GAM 1983 table were based originally on GAM 1971 base experience that was centered in 1966 and projected forward with an observation of mortality trend data. It has been our belief, in the task force, that the female tables that have been used for GAM 1983 had not reflected sufficient credible experience. We feel that what we're showing now is more than likely the first table that has a decent amount of female experience. That is, it is more than likely that this is the first table that has been produced that reflects a proper assessment of female mortality and its improvement trends. Yes, in relation to the GAM 1983 table, there is a moderate shift, but nevertheless, there is a shift in the positive direction. And we recommended that be used for future valuations and in funding.

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MR. MINGIONE: But it would be mostly for males and not as much as 4–6%?

MR. MALKIEWICH: It's not as much for females, that's correct. I want to make one other observation and comment then. We've already had a few discussions on the difference between the UP 1994 and the 1994 GAR. There is a concern, as stated throughout the discussion, whether UP 1994 mortality should or should not be projected, and if so, how it should be projected. There is definitely no consistent thought in the actuarial community as to whether funding should incorporate future mortality improvement. Our task force feels that for reserving purposes, that it's certainly appropriate. It seems that by definition, if one side is using mortality improvement, that the other side will possibly or would at least want to use mortality improvement as well. I'm curious as to what you might think of that discussion and question, as to how future mortality improvements should or should not be incorporated in funding regular pension plans and the like? The subcommittee will be discussing the issue.

MR. JONES: You want a vote, Lindsay? You should use all relevant information when you're reserving, and to not project is to ignore some information you have. So projection is appropriate.

MR. MALKIEWICH: Thank you, Don.

MR. TIMOTHY NICHOLAS MERCEZ: Did you look at any of the factors that may affect that projection scale? And how it could be adjusted to suit a particular type of demographic makeup?

MR. MALKIEWICH: No, as an answer to the question did the task force look at anything that might modify or affect that scale AA in future projection of mortality, it strikes me that it is very appropriate to do that, and the UP table or possibly even the third discussion report, would address that kind of an issue. And yes, I think it is appropriate. We did not do so in the task force. We felt that we wanted to come up with a single set of mortality improvement factors that could be reflected for a reasonable period of time. Calendar years 1977–93 were chosen to eliminate the high mortality improvements in the late 1960s and early 1970s. But also to not overly increase mortality improvement, which has been the experience in the late 1980s. And so we feel that the use of those years gives us a reasonable fit of mortality improvement for the 15–20 years to come. Certainly it does not indicate or imply that it is appropriate for every purpose.