LIFE INSURANCE (A) COMMITTEE

Reference:

1986 Proc. I p. 626
1986 Proc. II p. 645

Susan L. Walker, Chairman—S.D.
Margurite C. Stokes, Vice Chairman—D.C.

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December 9, 1986 Report 609

AGENDA

1. Report of Life Cost Disclosure Task Force
2. Report of Universal and Other New Plans Task Force
3. Report of Life and Health Actuarial Task Force
4. Any Other Matters Brought Before the Committee

The Life Insurance (A) Committee met in Salon VIII of the Marriott's Orlando World Center in Orlando Fla., at 3:45 p.m. on Dec. 9, 1986. A quorum was present and Susan L. Walker (S.D.) chaired the meeting. The following committee members or their representatives were present: Margurite C. Stokes, Vice Chair (D.C.); Roxani Gillespie (Calif.); Earl R. Pomeroy (N.D.); George F. Grode (Pa.); James M. Thomson (Va.); and Thomas P. Fox (Wis.).

1. Report of the AIDS Advisory Committee

Initially the AIDS Advisory Committee was formed to jointly coordinate its activities between the Accident and Health Insurance (B) Committee and the Life Insurance (A) Committee. Susan Walker (S.D.) has been involved with the work of the advisory committee since its formation in December 1985. She, therefore, summarized the report which the AIDS Advisory Committee gave to the Accident and Health Insurance (B) Committee. She noted that a consensus was never reached on the testing issue.

The Life Insurance (A) Committee received and adopted the AIDS Advisory Committee report as amended. The amendment consists of the addition of a new section at the end of the guidelines for use by the insurers in screening applications for underwriting purposes, as follows:

I. Options to be considered by each state.

Alternative A. Insurers should not be permitted to ask an applicant whether he or she has tested positive on an AIDS-related blood test.

Alternative B. Insurers should be permitted to ask an applicant whether he or she has tested positive on an AIDS-related blood test.

2. Report of Life Cost Disclosure Task Force

Brad Gile (Wis.) presented the report of the Life Cost Disclosure Task Force. The report contained proposals from the Yield Index Advisory Committee as well as the American Academy of Actuaries regarding amendment of language in the current model Life Solicitation Regulations on the use of yield indexes. The task force also recommended continuation.

The committee received the report of the Life Cost Disclosure Task Force. The committee agreed that the task force should continue.

3. Report of Universal and Other New Plans Task Force

Commissioner Grode presented the report of Universal and Other New Plans Task Force. The committee adopted items c and d of Section 1 of the report, which is contained in the minutes of the Universal and Other New Plans Task Force, as follows:

c. Delete the modified guaranteed life insurance plans project from the Actuarial Task Force agenda and

d. Re-prioritize the project on single premium life to the number one priority category.

The committee received items a and b of paragraph 1 of the task force report as follows:

a. Receive as an exposure draft for possible adoption in June 1987 the proposals on Universal Life Valuation, namely, the proposed amendment to an Actuarial Guideline XIV and the proposed amendment to the Universal Life Insurance Model Regulation; and

b. Receive as an exposure draft for possible adoption in June 1987 a proposal to modify the Universal Life Insurance Model Regulation concerning non-forfeiture provisions.

The committee also adopted the task force's recommendation for continuation.

4. Report of Life and Health Actuarial (EX5) Task Force

John Montgomery (Calif.) presented the report which outlined six recommendations as are contained in the Life and Health Actuarial (EX5) Task Force report to the A Committee.

{*Editor's Note: All documents presented by the Life and Health Actuarial (EX5) Task Force to any other NAIC entities appear together in the Proceedings. Material pertaining to the Life Insurance (A) Committee is Attachment One to the Life and Health Actuarial (EX5) Task Force report.*}

The committee adopted the recommendations proposed by the task force.

5. Any Other Matters Brought Before the Committee

Joe Mintz, life insurance agent from Texas, urged the committee to withdraw the proposed amendments on the yield indexes and dissolve the Yield Index Advisory Committee. The committee noted his comments.

Susan Walker mentioned the report of the Market Conduct Surveillance (EX3) Task Force, which proposed a model regulation concerning the sale of life insurance products coupled with annuities. This issue was referred to the A Committee; therefore, it will consider the regulation at the June meeting.

Having no further business, the Life Insurance (A) Committee adjourned at 4:15 p.m.

Susan L. Walker, Chairman, S.D.; Margurite C. Stokes, Vice Chairman, D.C.; Roxani Gillespie, Calif.; David A. Gates, Nev.; Earl R. Pomery, N.D.; George R. Grode, Pa.; James M. Thomson, Va.; Fred E. Wright, W.Va.; Thomas P. Fox, Wis.

LIFE COST DISCLOSURE (A) TASK FORCE

Reference:
1986 Proc. I p. 630
1986 Proc. II p. 647

Thomas P. Fox, Chairman—Wis.
Roxani Gillespie, Vice Chairman—Calif.

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AGENDA

1. Report of Yield Index Advisory Committee
2. Consider Continuation of Task Force
3. Any Other Matters Brought Before the Task Force

The Life Cost Disclosure (A) Task Force met in Salon G of the Marriott Orlando World Center in Orlando, Fla., at 4 p.m. on Dec. 8, 1986. A quorum was present and Gregory Krohm (Wis.) chaired the meeting. The following task force members or their representatives were present: Roxani Gillespie, Vice Chair (Calif.); Gil McCarty (Ky.); and Josephine M. Driscoll (Ore.).

1. Report of Yield Index Advisory Committee

Walter Miller (The Prudential), chair, presented the report of the Yield Index Advisory Committee (Attachment One). The report includes proposed model regulatory language on the use of a yield index. Mr. Miller mentioned that the Advisory Committee is not taking a position on whether there should be a yield index requirement. It is, however, providing language to amend the Life Insurance Disclosure Model Regulation as has been suggested by the Task Force. He also mentioned that his committee's report does not include a capping requirement which means that if the index is higher, only the crediting rate can be shown. According to the Advisory Committee, it is also not appropriate to go to a standardized low term rate basis, but it selected this route as the "lesser of two evils." Mr. Miller expressed his strong concern about the credibility of illustrations, and accordingly included revisions to the regulation to cover this even though it technically exceeded his committee's charge.

Mr. Miller recommended the use of either the interest adjusted cost comparison index or the yield index. Alan Lauer (Pa.) supported this idea and suggested that a decision need to be made on whether or not the yield index should be substituted if the yield index is in fact found to be a more satisfactory approach. It was the consensus of the committee that this issue should be discussed in the future.

Upon motion duly made and seconded, the Advisory Committee Report on Yield Indexes was received as an exposure draft for possible adoption of the proposed regulatory language in June of next year (Attachment One).

Bill Tozer (American Academy of Actuaries) presented changes to the NAIC Life Insurance Disclosure Model Regulation regarding sales disclosures with non-guarantee products sold by stock companies.

Upon motion duly made and seconded, the Task Force received Mr. Tozer's report as an exposure draft (Attachment Two).

2. Consider Continuation of Task Force

Upon motion duly made and seconded, the Task Force will recommend continuation to the Life Insurance (A) Committee.

3. Any Other Matters Brought Before the Task Force

Joe Mintz, a life insurance agent from Dallas, Texas, expressed his concerns over the implementation of a yield index model regulation.

Having no further business, the Life Cost Disclosure (A) Task Force adjourned at 4:50 p.m.

Thomas P. Fox, Chairman, Wis.; Roxani Gillespie, Vice Chairman, Calif.; Afa Roberts, American Samoa; Gil McCarty, Ky.; Peter Hiam, Mass.; Josephine M. Driscoll, Ore.

ATTACHMENT ONE

The Prudential
Prudential Plaza
Newark, NJ 07101

November 6, 1986

The Honorable Roxani M. Gillespie
Insurance Commissioner
California Department of Insurance
100 Van Ness Avenue
San Francisco, California 94102

Dear Commissioner Gillespie:

In your capacity as a member of the NAIC Life Cost Disclosure Task Force, I'm pleased to send you the attached report of the Yield Index Advisory Committee.

As requested by your task force after consideration of our report submitted in November 1985, we have developed proposed model regulatory language which embodies the proposals made in that report.

We received some valuable input on last year's report. As you might expect, some additional issues developed as we studied the best way to codify our proposals. As noted in the new report, this resulted in our changing one of our prior proposals (relating to "capping" of yield indexes). This also led to our developing proposed regulatory language, which we suggest should be applicable to all illustrations, addressing the very important question of credibility of illustrations and any cost comparison indexes or other material derived therefrom.

I'm looking forward to the discussion of this report which I understand is to take place at your meeting at 1 p.m. on Dec. 8. In the meantime, if you or your staff have any questions or comments regarding the attached material, I'll be glad to discuss them.

Sincerely,
Walter N. Miller
Chairman
Advisory Committee on Yield Indexes

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MEMORANDUM

To: NAIC Life Cost Disclosure Task Force
From: Walter N. Miller
Subject: Report of Yield Index Advisory Committee
Date: November 7, 1986

The charge originally given to this Advisory Committee was as follows:

> The Committee's first priority is to develop a yield index for interest-sensitive life insurance products and any other life insurance products that are marketed with emphasis on the interest element. After completion of this task, the Committee should address the additional work needed (e.g., at older ages and on non-traditional plans) in connection with further development of the test limits cited in the current NAIC Life Insurance Disclosure Model Regulation.

On Nov. 25, 1985, we submitted a report to the task force which covered the following ground:

- Regarding a yield index, the report recommended a formula and included a considerable amount of material relating to a number of "real world" aspects that needed to be addressed in connection with any yield index system that might be brought into the life insurance regulatory pattern.

The report noted, and it is important to re-emphasize here, that our committee is not taking a position on whether such regulatory action is appropriate.

- Regarding the discontinuity index test limits mentioned in the second part of the charge, the report presented a recommendation, with reasons, that any further work along these lines should not be pursued because it could not be productive.

After receiving our report, the task force asked us—and we agreed—to develop a codified version of our yield index recommendations which would be suitable for consideration as a possible model regulation. The task force also accepted our recommendation regarding further work on test limits.

Most of this report consists of our recommendation as to how a model regulation dealing with a yield index system should be worded. There are a number of ways in which this material could be framed—e.g., as a stand-alone item or as proposed amendments to an existing regulation. We decided to present our recommendations in the form of an amendment to the Life Insurance Disclosure Model Regulation, and it appears that the regulatory community would be comfortable with this approach. (See the attached letter from Commissioner Thomas Fox.) What really counts, though, are the concepts involved and the particular language used.

In general, the proposed amendment consists of additional language relating to yield index requirements. Adoption of such an amendment would superimpose yield index requirements on the interest-adjusted index requirements presently contained in the Life Insurance Disclosure Model Regulation. Some people will feel that the proliferation of figures resulting from this approach may not be in the consumer's best interest.

Since our committee is not making a recommendation as to whether there should in fact be a regulatory requirement for yield indexes, we are not making a recommendation on whether any yield index requirement, if adopted, should be in addition to present interest-adjusted requirements or instead of some or all of these requirements. However, this issue is one that regulators may well want to address.

Input Received on November 25, 1985 Report

We received valuable input, primarily from two sources:

- The NAIC Life and Health Actuarial (EX5) Task Force.

- The Subcommittee on Cost Comparisons of the American Council of Life Insurance.

Most of the comments were directed at our proposal that any published yield index be "capped" at being no higher than the credited rate whenever the calculated yield index produced a higher rate.

This situation had to be addressed. While a set of standardized term rates pitched at "low marketplace" levels* will minimize the chance of its occurrence, there is no way to have a set of standardized term rates that always will produce yield indexes lower than the credited rate.

(* Our 1985 report used this phrase to describe rates that approximate the lowest rates available.)

The committee continues to agree unanimously that some set of standardized term rates would be appropriate and a majority of the committee continues to feel that the "low marketplace" approach is not desirable for reasons stated in the prior report. We did, however, reconsider the tradeoffs involved in whether to have a "capping" requirement. We have reached the conclusion that we should reverse our earlier position as to which alternative, on balance, is less unpalatable.

Thus, our draft regulatory language does not involve a "capping" requirement because:

1. The use of a cap would distort the comparison among different policies, since two policies might both be subject to the cap but one might have a much higher actual (uncapped) yield index than the other.

2. Imposition of a cap might cause unintended restrictions on product development and pricing by generating pressures on product designers to revise and restructure any products where the cap might otherwise apply.

3. It might be difficult to define the rate at which the yield index for a participating policy would be capped.

4. Use of a cap would make it difficult to explain what an indicated yield index actually represents.

5. A yield index is, in any event, merely a comparison device. It does not measure the actual interest rate credited under the policy. Because of this and the terminology in the present Life Insurance Disclosure Model Regulation, we are proposing that the new measure be called the Yield Comparison Index. Neither this index nor an interest-adjusted index is intended to represent the "true" cost or yield under a policy.* Both can be helpful in considering the relative value of several policies.

(* This is the key point in responding to anyone who asks how a Yield Comparison Index figure can be higher than the gross interest rate credited under the policy. This index is based on certain (standardized) assumptions and must be viewed as a comparison measure rather than a "true" yield.)

Term Rates

As indicated above, a majority of the committee continues to feel that the "low marketplace" approach is not advisable. We have restudied the situation in light of comments on our 1985 report and considerable discussion among ourselves since then. The term rate basis presented herein is, in general, somewhat lower that the basis suggested in our prior report, especially at older ages, and now incorporates a 10 year select and ultimate approach. It presents what we now believe to be a more realistic approach, taking into account all of the factors involved.

We should observe that whatever standardized term rate basis might be adopted at the outset of any yield index regulation almost certainly will have to be modified periodically to reflect changes in "real world" conditions. Otherwise, there will be a growing amount of distortion.

Other Aspects

In most other respects, our proposed regulatory language follows the concepts suggested in our prior report. For convenience, these concepts are summarized here:

- We felt the primary purpose of a yield index would be in connection with new policies and the proposed amendment is worded accordingly. The proposed formula is adaptable for use with in-force policies and a consistent approach should be taken for any such use. As stated in a drafting note, selection of an appropriate term rate basis for in-force policies needs special attention.

- Any yield index requirements were recommended to cover "summary periods" of 5, 10 and 20 years. The proposed formula is adaptable to a year-by-year approach if such figures are desired on a consistent approach.

- The yield index formula is a modification of the Linton method. The proposed formulation, together with some possible alternatives, is discussed in the attached Appendix, which also gives considerable numerical information on the proposed term rate basis.

- While the current interest-adjusted requirements specify use of the cash (or equivalent premium reduction) dividend option for participating policies, we recommended the paid-up addition option as the one to be used in yield index calculations. This reflects current trends and is important in producing as much comparability as possible between traditional participating policies and non-traditional policies. Under the latter it is quite common to have additional interest credits used to build up additional death and cash value benefits inside the policy.

- For non-traditional policies, the death benefit pattern should be the one applied for. It didn't seem practical or useful to mandate a predetermined pattern or option in all cases.

- The premium payment pattern for non-traditional policies should be that applied for. We felt this was necessary because the level and incidence of premium payments under these policies does affect the build-up of benefits. On the other hand, under traditional policies, benefits are generally the same regardless of the mode of premium payment so there seemed to be no need to reflect the specific premium payment, pattern in yield index calculations for these policies.

However, we would like to repeat our observation that consideration should be given to introduction of some specific form of disclosure relating to premium payments made more frequently than annually under traditional policies.

- The actual size of the particular policy under consideration should be used. There seemed to be no real advantage gained from mandating one specific policy size for all yield index calculations.

- We felt it was neither practical nor desirable to suggest a yield index system which took specific account of a prospect's tax bracket.

- We recommended that yield indexes be shown for summary periods of 5, 10 and 20 years. We recognize the 5-year requirement is additional to the pattern of interest-adjusted figures now required, but believe that it is important to show a yield index at some duration earlier than 10.

Credibility of Illustrations

In the six meetings we have held since our prior report was submitted, the topic that most dominated our conversations did not relate to the yield index system per se, but rather to the credibility of yield indexes or any other figures derived from illustrations of products with non-guaranteed pricing elements.* Policies of this nature make up the overwhelming majority of those sold today and likely to be sold in the future.

(* By "non-guaranteed pricing elements," we mean either the dividends in a traditional participating policy or any elements subject to change at company discretion—such as premiums, interest rates, and mortality charges—in the so-called non-traditional policies that have come to the fore recently.)

After all, the "best" cost comparison and disclosure system is no better in terms of real value to consumers than the quality of the illustrative information from which it is prepared. But, surveying current developments, it has been reported that some illustrations assume yearly improvements in mortality charges without so stating. It has also been reported that some illustrations assume higher credited interest rates than those currently payable on similar policies, without so stating. There have been other examples on this theme.

Accordingly, our proposed regulatory language includes the following:

> Any illustration of non-guaranteed costs or benefits shall state if it displays costs or benefits more favorable than those based on the non-guaranteed factors in effect for similar policies in-force at the time the illustration is prepared. However, such a statement need not be made with respect to any non-guaranteed factors that have been publicly announced by the company with a future effective date, provided that the illustration states that effective date.

Unlike the rest of our proposed regulatory language which is applicable specifically to a yield index system we are proposing that the language above be made applicable to all illustrations. It seems clear that any provision like this is hardly worth having if it does not have such general applicability.

We recognize that addressing this issue and including proposed regulatory language like the above can be interpreted as going beyond our charge. But we feel the issue is of primary importance, even though there are questions of illustration credibility that can probably never be successfully addressed in any workable regulatory system. For example, consider companies A and B that are crediting and illustrating the same rate on their otherwise similar universal life policies, but whose asset portfolios differ markedly in quality.

But the critical issues of illustration credibility are not addressed in regulation today and we hope that the proposal outlined above will provide a constructive start.

Reimbursement of Some Committee Members for Travel Expenses

Let us repeat an observation we made in our 1985 report. Our committee contains two members who are not associated with organizations that are able to reimburse expenses of traveling to meetings of committees such as ours. We have held most of our meetings at sites that would facilitate the attendance of these members (although there is no one site that would facilitate the attendance of both of them). Thus, our work has been hampered because we have been unable to obtain the full participation of both of these members at all of our meetings. We hope the NAIC becomes willing to reimburse travel expenses in such situations. We feel this is important if the NAIC is to successfully maintain its proper policy of seeking to have the widest possible range of viewpoints and backgrounds represented on its advisory committees.

* * * * *

Finally, let me add a personal note of thanks to our committee members for their dedication and outstanding efforts. A special note of thanks is due our observers. Many of them participated fully in our deliberations and shared in the production of this report, particularly Michael Levine who did much of the technical work, formulation and testing. Because of these special efforts, the names of our "regular observers" are also listed below.

Walter N. Miller
Chairman,
Yield Index Committee
On Behalf of the Committee

Committee Members	Observers
William N. Albus	James D. Brock
Joseph M. Belth	Emily S. Crandall
Kenneth P. Hinsdale	H. Daniel Gardner
James H. Hunt	Michael Levine
James M. Jackson	Anthony T. Spano
Donald B. Maier	Stephen E. White
Charles E. Rumbarger	
James L. Sedgwick	

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State of Wisconsin
Office of the Commissioner of Insurance
P.O. Box 7873
Madison, Wis. 53707

June 17, 1986

Mr. Walter M. Miller, Chairman
Yield Index Advisory Committee
The Prudential Insurance Company of America
Corporate Office - Prudential Plaza
Newark, NJ 07101

Re: Your Letter to John Montgomery dated May 5, 1986

Dear Mr. Miller:

We are very pleased that you are moving ahead and definitely shooting for a target of a complete report for the task force to consider at the December 1986 NAIC meeting. In your letter to John Montgomery, you asked for a suggestion as to the mechanical nature of the draft language. The alternatives which you suggest were (1) draft a complete stand-alone regulation, (2) draft language as an amendment to the existing NAIC Life Insurance Disclosure Model Regulation, (3) have an amendment to the model advertising regulation, or (4) language which might be incorporated with any one of the above three approaches. I believe that the most natural approach would be to draft language as an amendment to the existing Life Insurance Disclosure Model Regulation. It is my understanding that the NAIC Life and Health Actuarial (EX5) Task Force came to the same conclusion at the Boston NAIC meeting in June. I agree that this particular matter should not delay your work and I look forward to your report in December.

Sincerely yours,
Thomas P. Fox, Chairman
Life Cost Disclosure Task Force

cc: Mr. John O. Montgomery, FSA, MAAA
Chief Actuary and Deputy Insurance Commissioner
California Department of Insurance
600 South Commonwealth Avenue
Los Angeles, CA 90005

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DRAFT

YIELD INDEX AMENDMENTS TO LIFE INSURANCE DISCLOSURE MODEL REGULATION

(Blocks of all new language are printed in italics. Other changes in the present model regulation are shown by underlining additions and bracketing deletions.)

Table of Contents

Section 4. Definitions
Section 7. General Rules
Appendix A. Life Insurance Buyer's Guide

Drafting Note. The advent of new life insurance plans has resulted in insurers placing more emphasis in their advertising (as well as in their policy design) on the cash value build-up and the policy's interest element. Requiring insurers to deliver to life insurance purchasers Life Insurance Yield Comparison Index figures will provide purchasers with a comparison measure which reflects the insurance protection and cash accumulation features of life policies. The index will also be helpful in evaluating life insurance advertising which includes a numerical percent figure or illustrates dollar returns. The 5, 10 and 20-year periods for the Life Insurance Yield Comparison Index figures differ from the 10 and 20-year periods used in connection with the Surrender and Net Payment Cost Comparison Indexes, but provide important additional information.)

(. . .)

Section 4. Definitions.

(. . .)

J. {Cost} Comparison Indexes.

(Drafting Note. The formulas which follow are geared to an "at issue" situation, with x = issue age and t = policy year. Consistent formulas for an in-force policy can be obtained using x = attained age at beginning of calculation period and t = policy year since beginning of calculation period.)

(. . .)

5. Life Insurance Yield Comparison Index - Illustrated Basis. The Life Insurance Yield Comparison Index - Illustrated Basis is calculated by applying the following steps:

a. Determine the Illustrated Cash Value and Illustrated Death Benefit for each of the first twenty policy years.

b. Obtain the Standardized Value of Death Protection for each of the first twenty policy years.

c. The Life Insurance Yield Comparison Index - Illustrated Basis for five years is the interest rate at which the sum of the present values of the Standardized Annual Retention - Illustrated Basis for the first five years equals zero. This is computed according to the formula:

$$0 = \sum_{t=1}^{5} \left(\frac{1}{1+i}\right)^t (SARI_t)$$

where $SARI_t$ is the Standardized Annual Retention - Illustrated Basis for policy year t as defined in Section 4(P)(12). The Life Insurance Yield Comparison Index - Illustrated Basis for ten years is the interest rate at which the sum of the present values of the Standardized Annual Retention - Illustrated Basis for the first ten years equals zero. The Life Insurance Yield Comparison Index - Illustrated Basis for twenty years is the interest rate at which the sum of the present values of the Standardized Annual Retention - Illustrated Basis for the first twenty years equals zero.

6.Life Insurance Yield Comparison Index - Guaranteed Basis. The Life Insurance Yield Comparison Index - Guaranteed Basis is calculated by applying the following steps:

a. Determine the Guaranteed Cash Value and Guaranteed Death Benefit for each of the first twenty policy years.

b. Obtain the Standardized Value of Death Protection for each of the first twenty policy years.

c. The Life Insurance Yield Comparison Index - Guaranteed Basis for five years is the interest rate at which the sum of the present values of the Standardized Annual Retention - Guaranteed Basis for the first five years equals zero. This is computed according to the formula:

$$0 = \sum_{t=1}^{5} \left(\frac{1}{1+i}\right)^t (SARG_t)$$

where $SARG_t$ is the Standardized Annual Retention - Guaranteed Basis for policy year t as defined in Section 4(P)(13). The Life Insurance Yield Comparison Index - Guaranteed Basis for ten years is the interest rate at which the sum of the present values of the Standardized Annual Retention - Guaranteed Basis for the first ten years equals zero. The Life Insurance Yield Comparison Index - Guaranteed Basis for twenty years is the interest rate at which the sum of the present values of the Standardized Annual Retention - Guaranteed Basis for the first twenty years equals zero.

K. Nonguaranteed Factor. A Nonguaranteed Factor is any {premium, benefit or other} item entering into the calculation of {the Surrender Cost} a Comparison Index - Illustrated Basis that can be changed by the company without the consent of the of the policyowner. Such items include, but are not limited to, premiums, benefits, interest rates, mortality charges, expense charges, and dividends.

(Drafting Note. It was felt appropriate to list a number of possible nonguaranteed factors, but the language is intended to make it clear that any others not listed but meeting the definition, i.e. can be changed by the company without policy owner consent, are also included.)

(. . .)

M. Policy Summary.

(. . .)

7. a. The Surrender and Net Payments Cost Comparison Indexes for ten and twenty years...

b. The Life Insurance Yield Comparison Index for five, ten and twenty years. Indexes shall be shown on the Guaranteed Basis as defined in Section 4(J)6 and, if there is a Nonguaranteed Factor, shall also be shown on the Illustrated Basis as defined in Section 4(J)5. In any case where the guaranteed or illustrated cash value at the end

of five, ten or twenty years (as appropriate) is zero, the corresponding index need not be shown and wording substantially equivalent to "not applicable - zero cash value" should be shown. Such indexes need not be included for (a) basic policies under which the illustrated cash value never exceeds $200 per $1,000 of death benefit during the first twenty policy years, (b) optional rider under which the illustrated cash value never exceeds $200 per $1,000 of death benefit during the first twenty policy years, or (c) any basic policies or optional riders covering more than one life.

In a case involving an optional rider under which the illustrated cash value is $200 or more per $1,000 of death benefit at some point during the first twenty policy years, the Yield Comparison Index shall be calculated for the policy/rider combination.

(Drafting Note. The above combination approach will provide better comparisons between (a) traditional policies with riders developing substantial cash values and (b) non-traditional policies with similar overall premium payment patterns.)

(. . .)

10. This statement in close proximity to the {cost} Comparison Indexes: "An explanation of the intended use of these indexes is provided in the Life Insurance Buyer's Guide."

P. Life Insurance Yield Comparison Index Additional Definitions. For the purpose of these amendments, the following definitions shall apply:

1. Dividend Option. The dividend option for participating policies is that option which applies the policy dividends to purchase paid-up whole life or endowment additions.

2. Death Benefit Pattern. Where the policy provides several death benefit options, the death benefit is that according to the death benefit option for which applicant applied.

3. Premium Payment Pattern. The premium paying pattern is the fixed level(s) of premiums payable for a specified number of years under the contract that is illustrated or for which the applicant applies. If the policy applied for does not specify a fixed level(s) of premiums payable and the duration, the premium paying pattern shall be the level and incidence of premium payments for which the individual applied.

4. Policy Size. The policy size is the initial face amount of the death benefit for which the individual applied.

5. Frequency of Premium Payment. The frequency of premium payment is the annual mode under a policy whose death benefit and/or cash values do not vary if the premiums are paid on other than an annual basis. The frequency of premium payment is that mode for which the applicant applied under a policy whose death benefit and/or cash values vary based upon the frequency of premium payment.

(Drafting Note. It is not intended that a refund of premium paid beyond the time of death be interpreted as causing death benefit variation because of mode premium payment.)

6. Illustrated Cash Value. The illustrated Cash Value for each policy year is the cash surrender value that will be available at the end of that policy year under the Current Rate Schedule and Current Dividend Scale (if applicable), based on the assumed Death Benefit Pattern, Premium Payment Pattern, Frequency of Premium Payment and Dividend Option (if applicable), and based on the further assumptions that no funds are withdrawn from the policy and no loans are made against the policy.

7. Guaranteed Cash Value. The Guaranteed Cash Value for each policy year is the minimum cash surrender value at the end of that policy year, as guaranteed in the policy, based on the assumed Death Benefit Pattern, Premium Payment Pattern and Frequency of Premium Payment, and based on the further assumptions that no funds are withdrawn from the policy and no loans are made against the policy.

8. Illustrated Death Benefit. The Illustrated Death Benefit for each policy year is the death benefit that would be payable at the end of that policy year under the Current Rate Schedule and Current Dividend Scale (if applicable), based on the assumed Death Benefit Pattern, Frequency of Premium Payment and Dividend Option (if applicable), and based on the further assumptions that no funds are withdrawn from the policy and no loans are made against the policy.

9. Guaranteed Death Benefit. The Guaranteed Death Benefit for each policy year is the minimum death benefit payable to a policy holder who dies at the end of that policy year, as guaranteed in the policy, based on the assumed Death Benefit Pattern, Premium Payment Pattern and Frequency of Premium Payment, and based on the further assumptions that no funds are withdrawn from the policy and no loans are made against the policy.

10. Standardized Value of Death Protection. The Standardized Value of Death Protection per $1,000 for each policy year is based on the Policyholder Classification and the Policy Size. It is calculated as:

$$SVDP_t = .95q_{x,t} + .70 + \frac{35}{S}$$

where $SVDP_t$ = Standardized Value of Death Protection per $1,000

$q_{x,t} = (q^u_{x+t-1})(sel_{x,t})$

where x = issue age

t = policy year

q^u_{x+t-1} = Mortality rate per $1,000 at age (x + t − 1), according to the 1980 CSO Basic table that corresponds to the sex and smoking status as defined in the Policyholder Classification

$sel_{x,t}$ = the 1980 CSO Graded Select Factor corresponding to the sex as defined in the Policyholder Classification

(Drafting Note. This definition of x and t is not appropriate for use with an in-force policy if the purpose of the calculate is to evaluate a potential replacement where it is assumed that the policyowner can qualify for new insurance. In such a case, x should be the attained age instead of the original issue age and t should be the policy year since the calculation date. The above definition may be appropriate in other situations with in-force policies.)

S = Policy Size in $1,000s.

11. Policyholder Classification. The Policyholder Classification is the policyholder's issue age (on an Age Nearest Birthday basis or an Age Last Birthday basis), sex and smoking status as set forth in the policy. However, unisex status is to be used only if a unisex rate structure is required by applicable law or regulation, and the smoking status is Nonsmoker if the premium rate or mortality charge basis under the policy is not available to smokers, otherwise it is Smoker.

(Drafting Note. This approach automatically produces a smoker status if the rate structure under the policy does not provide for the possibility of a nonsmoker discount. This approach was selected because in such cases, the company may not have information as to the applicant's smoking status.)

12. Standardized Annual Retention - Illustrated Basis. The Standardized Annual Retention - Illustrated Basis for each policy year is calculated as:

$$SARI_t = (P_t + ICV_{t-1})(1 + i) - ICV_t - SVDP_t\,(.001)\,(IDB_t - ICV_t)$$

(Drafting Note. For a policy under which case values and/or death benefits may vary according to the frequency of premium payment, the first term in the above formula should be $P_t\left(\frac{1}{1+i}\right)^{\frac{m-1}{2^m}}$ *where m is the number of premium payments in the year. The interest factor was omitted for the sake of simplifying the calculation; this tends to depress the index. Companies should be allowed to use the theoretically correct approach, or an alternative approach, if they can certify that their method does not produce index values higher than the theoretical approach.)*

where

$SARI_t$ = Standardized Annual Retention - Illustrated Basis for policy year t

P_t = Total premium for policy year t

ICV_t = Illustrated Cash Value for policy year t

ICV_{t-1} = Illustrated Cash Value for policy year (t-1)

IDB_t = Illustrated Death Benefit for policy year t.

100i = Yield Comparison Index

13. Standardized Annual Retention - Guaranteed Basis. The Standardized Annual Retention - Guaranteed Basis for each policy year is calculated as:

$$SARG_t = (P_t + GCV_{t-1})(1 + i) - GCV_t - SVDP_t\,(.001)\,(GDB_t - GCV_t)$$

(See the drafting note in 12. above.)

where

$SARG_t$ = Standardized Annual Retention - Guaranteed Basis for policy year t

P_t = Total premium for policy year t

GCV_t = Guaranteed Cash Value for policy year t

GCV_{t-1} = Guaranteed Cash Value for policy year (t-1)

GDB_t = Guaranteed Death Benefit for policy year t.

Section 5. Duties of Insurers.

A. (. . .)

3. (. . .)

b. (. . .)

i. The following statement displayed prominently on the Policy Summary and on all other sales material that show or incorporate a {Cost} Comparison Index: "This policy has an unusual pattern of premiums or benefits that may make comparison with the {cost} Comparison {i} Indexes of other policies unreliable. Your should discuss this with your agent or this company. A statement of year-by-year information is available."

(. . .)

Section 7. General Rules.

(. . .)

G. Any statement regarding the use of the Surrender or Net Payment {Cost} Comparison Indexes shall also include an explanation to the effect that the indexes are useful only for the comparison of similar policies.

H. {A Cost} Any Comparison Index which reflects...

I. Any illustration of nonguaranteed costs or benefits shall state if it reflects costs or benefits more favorable than those based on the Nonguaranteed Factors in effect for similar policies in-force at the time the illustration is prepared. However, such a statement need not be made with respect to any Nonguaranteed Factors that have been publicly announced by the company with a future effective date, provided that the illustration states that effective date.

J. Any advertisement which includes any Nonguaranteed Factor or Yield Comparison Index must also contain the Life Insurance Yield Comparison Index for 5, 10, and 20 years for a specific policy covered by the advertisement. The advertisement must further set forth the policy specifications upon which the Yield Comparison Indexes were calculated. Such policy specifications must include:

— the plan of insurance;
— the amount of death benefit;
— the insured's age at issue, sex and underwriting classification;
— the policy premium and frequency of payment.

The advertisement must also call attention to the fact that the Life Insurance Yield Comparison Indexes applicable in a particular case may vary significantly from those shown in the advertisement, and any interested person should be encouraged to contact the insurance company or its agents to obtain Life Insurance Yield Comparison Indexes based on policy specifications appropriate to his or her particular situation.

(Drafting Note. It was assumed that the information required above can be expressed in reasonable length. The importance of its inclusion justifies the additional wording required.)

Appendix A. Amendments to Life Insurance Buyer's Guide.

Yield Comparison Index. The Life Insurance Yield Comparison Index is a measure of cash value growth which reflects interest, less charges for such items as the policy's share of death benefits and company expenses. A higher yield index number generally indicates a better buy. Since this index reflects items other than interest earnings, it differs substantially from the return on a pure investment like a saving account. Keep this in mind if you attempt to compare Yield Indexes with investment returns.

Using {Cost} Comparison Indexes. The most important thing to remember is that, when using the Surrender and Net Payment Cost comparison Indexes, a policy with smaller index numbers is generally a better buy than a similar policy with larger index numbers. When using the Life Insurance Yield Comparison Index, the opposite is true: a policy with

larger Yield Comparison Index numbers is generally a better buy than one with smaller Yield Comparison Index numbers.

Compare cost comparison index numbers only for similar policies — those which provide essentially...

(. . .)

Things to Remember

(. . .)

* Ask about {cost} comparison index numbers and check several companies which offer similar policies. Remember, smaller index numbers generally represent a better buy when using the Surrender and Net Payment Cost Comparison Indexes. But larger index numbers generally represent a better buy when using the Life Insurance Yield Comparison Indexes.

(. . .)

APPENDIX
TECHNICAL MEMORANDUM
DEVELOPMENT OF THE YIELD
INDEX COMPUTATION MECHANISM

As recommended by the NAIC Yield Index Advisory Committee, the Yield Index is an internal interest rate derived from policy values (premiums, death benefits, cash values, etc.) and from annual mortality charges which reflect standardized assumptions as to the value of death protection.

The ultimate purpose of this memorandum is to define precisely:

1. The formula for the solution of the yield index as a function of policy values and standardized value of death protection (the "overall formula").

2. The formula for the determination of the standardized value of death protection (the "standardized value formula").

This memorandum is further intended to explain the logic behind these formulas and to discuss the issues that were confronted in developing them. It is divided into sections as follows:

I. Background
II. Derivation of the Yield Index Formula
III. Relationship Between the Proposed Yield Index and the Linton Yield
IV. Standardized Value of Death Protection
V. Proposed Overall Formula
VI. Iterative Solution Technique.

Those who are interested only in the actual recommendation should refer directly to Sections IV and V.

I. Background

An extremely thorough and readable discussion of cost comparison techniques is Analysis of Life Insurance Cost Comparison Index Methods, prepared by the Society of Actuaries Committee on Cost Comparison Methods and Related Issues (Special), September 1974, (hereinafter referred to as the Society Analysis). Except as otherwise indicated, this memorandum will adhere to the definitions and nomenclature in that document. Some key definitions at this point are:

x	issue age
t	policy duration
n	time horizon - number of policy durations being analyzed in the context of a particular comparison method or index
${}_tP_x$	annual premium at beginning of year t for issue age x
${}_tD_x$	annual (cash) dividend at end of year t for issue age x
${}_tF_x$	death benefit in year t for issue age x, excluding any terminal dividend payable on death

${}_tCV_x$	cash value at end of year t for issue age x, excluding any terminal dividend payable on surrender
${}_tTD_x$	terminal dividend payable on death in year t, or on surrender at end of year t, for issue age X
q^D_{x+t-1}	probability that a person age $(x+t-1)$ dies before age $(x+t)$
q^w_{x+t-1}	probability that a person age $(x+t-1)$ surrenders before age $(x+t)$
${}_{t-1}Z_x$	Probability that a person age x survives and persists to ages $(x+t-1)$ $\prod_{s=1}^{x+1} \left(1 - q^D_{x+s-1} - q^w_{x+s-1}\right)$
i	annual interest rate
v	$1/(1+i)$
${}_tL_x$	loading at beginning of year t representing company retention for expenses, taxes, contribution to surplus and profits to stockholders, if any

The Society Analysis is also very useful because it demonstrates how various cost comparison measures can be seen as simplified and standardized applications of the gross premium formula ("GPF"). The GPF is a general theoretical expression that a company can use as a basis for measuring the return form a product. It is presented as:

$$\begin{aligned}\sum_{t=1}^{n}({}_tP_x)(V^{t-1})({}_{t-1}Z_x) = {} & \sum_{t=1}^{n}({}_tF_x + {}_tTD_x)(V^t)({}_{t-1}Z_x)(q^D_{x+t-1}) \\ & + \sum_{t=1}^{n}({}_tD_x)(V^t)({}_{t-1}Z_x) \\ & + \sum_{t=1}^{n}({}_tCV_x + {}_tTD_x)(V^t)({}_{t-1}Z_x)(q^w_{x+t-1}) \\ & + ({}_nCV_x + {}_nTD_x)(V^n)({}_nZ_x) \\ & + \sum_{t=1}^{n}({}_tL_x)(V^{t-1})({}_{t-1}Z_x)\end{aligned}$$

In other words, over n years (on a present values basis),

Premiums = Cost of Death Claims
+ Cost of Surrenders
+ Dividends Paid
+ Year n Surrender Liability
+ Company Retentions

To analyze the value of the product—whether from the company's viewpoint or the policyholder's—the company retention would be the balancing item in the analysis

$$\begin{aligned}\sum_{t=1}^{n}({}_tL_x)(V^{t-1})({}_{t-1}Z_x) = {} & \sum_{t=1}^{n}({}_tP_x)(V^{t-1})({}_{t-1}Z_x) \\ & - \sum_{t=1}^{n}({}_tD_x)(V^t)({}_{t-1}Z_x) \\ & - \sum_{t=1}^{n}({}_tF_x + {}_tTD_x)(V^t)({}_{t-1}Z_x)(q^D_{x+t-1}) \\ & - \sum_{t=1}^{n}({}_tCV_x + {}_nTD_x)(V^t)({}_{t-1}Z_x)(q^w_{x+t-1}) \\ & - ({}_nCV_x + {}_nTD_x)(V^n)({}_nZ_x)\end{aligned}$$

As shown in the Society Analysis, this is a plausible cost comparison method. It differs from the accepted Company Retention index only slightly (p. 175). and it is identical to the suggested Modified Company Retention index (p. 154). The Society Analysis, also demonstrates that the GPF can be translated mathematically into some of the more common indexes, such as the Interest Adjusted Cost Index ("IAC"). If zero mortality and withdrawal are assumed, the GPF becomes

$$\sum_{t=1}^{n} ({}_tL_t)(v^{t-1}) = \sum_{t=1}^{n} ({}_tP_t)(v^{t-1}) - \sum_{t=1}^{n} ({}_tD_t)(v^t) - ({}_nCV_t + {}_nTD_t)(v^n)$$

Dividing by the annuity $\ddot{a}_{\overline{n}|i} = \sum_{t=1}^{n} v^{t-1}$

produces

$$\frac{\sum_{t=1}^{n} ({}_tL_t)(v^{t-1})}{\sum_{t=1}^{n} (v^{t-1})} = \frac{\sum_{t=1}^{n} ({}_tP_t)(v^{t-1}) - \sum_{t=1}^{n} ({}_tD_t)(v^t) - ({}_nCV_t + {}_nTD_t)(v^n)}{\sum_{t=1}^{n} (v^{t-1})}$$

which is the IAC (pp. 175-179).

The purpose of this discussion in not simply to restate the Society Analysis, nor is it solely to establish a foundation for further technical development. It is important also because it illuminates some broader conceptual points.

1. In many respects, company product analysis and policyholder cost comparison are measuring the same thing—the company's "retention" is the policyholder's "cost."

2. As refined as the GPF may seem relative to the IAC, it still incorporates a large number of simplifications. As stated in the Society Analysis, it assumes that:

> premiums are paid annually at the beginning of the year; death benefits are paid at the end of the year in which death occurs; withdrawals occur at the end of the year; there is no refund of premium in the event of death or withdrawal; annual and terminal dividends are payable at the end of the year; and the annual dividend for the year in which death or withdrawal occurs is payable in full at the end of that year. (p. 174, fn)

3. While company actuaries should be able to further refine their analytical models (incorporating monthly premiums, death benefits paid at time of death with premium refund, etc.), the practical constraints on standardized cost comparison methods are much greater. These practical constraints are probably as relevant to a proposed Yield Index as they are to an IAC.

4. The need for standardization in cost comparison applies to the assumptions as well as the formulas. Any particular company will use its own interest, mortality and withdrawal experience with the GPF to measure the retention on a product. However, a person using the GPF to analyze a variety of policies on behalf of a policyholder (with retention representing policyholder costs) will use standardized values—values consistent with the situation of the policyholder.

II. Derivation of the Yield Index Formula

It is useful to present the Yield Index Committee's proposed formula as a mathematical derivation from the GPF in the Society Analysis.

First, note that the present value of the Year n Surrender Liability can be expanded such that it equals the present value of the annual increases in liability

$$\begin{aligned}
&({}_nCV_t + {}_nTD_t)(v^n)({}_nZ_t) \\
&= \sum_{t=1}^{n} ({}_tCV_t + {}_tTD_t)(v^t)({}_tZ_t) - \sum_{s=0}^{n-1} ({}_sCV_t + {}_sTD_t)(v^s)({}_sZ_t) \\
&= \sum_{t=1}^{n} ({}_tCV_t + {}_tTD_t)(v^t)({}_tZ_t) - \sum_{t=1}^{n} ({}_{t-1}CV_t + {}_{t-1}TD_t)(v^{t-1})({}_{t-1}Z_t) \\
&= \sum_{t=1}^{n} \left[({}_tCV_t + {}_tTD_t)(v^t)({}_tZ_t) - ({}_{t-1}CV_t + {}_{t-1}TD_t)(v^{t-1})({}_{t-1}Z_t) \right] \\
&= \sum_{t=1}^{n} (v^{t-1})({}_{t-1}Z_t) \Big[({}_tCV_t + {}_tTD_t)(v)(1 - q^D_{x+t-1} - q^W_{x+t-1}) \\
&\qquad - ({}_{t-1}CV_t + {}_{t-1}TD_t) \Big]
\end{aligned}$$

This expression can be substituted into the company retention form of the GPF, enabling us to rewrite the formula entirely as the present value of separate annual loads

$$\sum_{t=1}^{n} ({}_tL_x)(V^{t-1})({}_{t-1}Z_x)$$

where

$$\begin{aligned} {}_tL_x = {}_tP_x &- v({}_tD_x) \\ &- v(q^D_{x+t-1})({}_tF_x + {}_tTD_x) \\ &- v(q^W_{x+t-1})({}_tCV_x + {}_tTD_x) \\ &- v(1 - q^D_{x+t-1} - q^W_{x+t-1})({}_tCV_x + {}_tTD_x) \\ &+ ({}_{t-1}CV_x + {}_{t-1}TD_x) \end{aligned}$$

The annual load can be further simplified as

$$\begin{aligned} {}_tL_x = {}_{t-1}CV_x &+ {}_{t-1}TD_x + {}_tP_x \\ &- v(q^D_{x+t-1})({}_tF_x + {}_tTD_x) \\ &- v(1 - q^D_{x+t-1})({}_tCV_x + {}_tTD_x) \\ &- v({}_tD_x) \end{aligned}$$

Stated verbally, the total company load at the start of each year equals

Prior Year Liability
+ Premium
- PV of End of Year Death Claims
- PV of End of Year Liability to Those not Dying
- PV of End of Year Dividends

Note that the annual withdrawal rate drops out of the definition of annual retention.

The annual load can also be restated in terms of an amount "at risk"

$$\begin{aligned} {}_tL_x = {}_{t-1}CV_x &+ {}_{t-1}TD_x + {}_tP_x \\ &- v(q^D_{x+t-1})({}_tF_x - {}_tCV_x) \\ &- v({}_tCV_x + {}_tTD_x + {}_tD_x) \end{aligned}$$

Now, instead of solving for the present value of loads we can recast the problem to one requiring the solution for an interest rate. Specifically, we want to find the interest rate such that the present value of loads equals zero. This, with a few modifications, is the method proposed by the Yield Index Committee.

One modification, is that the mortality and withdrawal rates are assumed to be zero for the purpose of computing present value. i.e.,

$${}_{t-1}Z_x = 1$$

at all durations. This has the effect of giving more weight to the later durations, but it substantially simplifies the computation and the overall impact is small.

The second modification is more conceptual than mathematical. It involves adjusting the "mortality rate" from the company's expected mortality to a basis which reflects more accurately the policyholder's utility or value of death protection. Thus, the mortality should be somewhat conservative and should be adjusted to reflect the expenses that would reasonably be incurred in the purchase of death protection. In other words, some of the elements previously defined as part of company load should be considered part of the value of death protection. For this reason, we will now speak in terms of the annual retention (R_t) instead of the annual load. The retention concept is designed to exclude those elements which are reasonably part of the value of death protection. Section IV discusses further the Committee's recommended basis for calculating the standardized value of death protection.

The third modification involves the exact definition of the annual retention. From the Basic definition, which was completely consistent with the GPF assumptions,

$$
\begin{aligned}
{}_tR_x = {}&{}_{t-1}CV_x + {}_{t-1}TD_x + {}_tP_x \\
&- v(q^D_{x+1-1})({}_tF_x + {}_tTD_x) \\
&- v(1-q^D_{x+t-1})({}_tCV_x + {}_tTD_x) \\
&- v({}_tD_x)
\end{aligned}
$$

Now, as Alternative A, let us assume that death claims are paid at the beginning of the year, and that annual dividends are not paid to those who die. The consistent definition of annual retention will thus become

$$
\begin{aligned}
{}_tR_x = {}&{}_{t-1}CV_x + {}_{t-1}TD_x + {}_tP_x \\
&q^D_{x+t-1}\left({}_tF_x + {}_tTD_x\right) \\
&- v\left(1-q^D_{x+t-1}\right)\left({}_tCV_x + {}_tTD_x + {}_tD_x\right)
\end{aligned}
$$

Mathematically, a yield index could be computed on these assumptions without substantially affecting the results.

Reasonable methods underlie both the Basic definition and Alternative A. The Basic definition is most consistent with the GPF in the Society Analysis, but Alternative A is most consistent with the usual definition of the Linton Yield, as demonstrated in Section III. And it is not difficult to define the mathematics for more refined models, as a few examples will demonstrate.

One refinement (Alternative B) assumes a mid-year death claim with prorata premium refund and dividend payment.

$$
\begin{aligned}
{}_tR_x = {}&{}_{t-1}CV_x + {}_{t-1}TD_x + {}_tP_x \\
&-(v)^{.5}\left(q^D_{x+t-1}\right)\left({}_tF_x + {}_tTD_x + .5\left({}_tP_x + {}_tD_x\right)\right) \\
&v\left(1-q^D_{x+t-1}\right)\left({}_tCV_x + {}_tTD_x + {}_tD_x\right)
\end{aligned}
$$

Another refinement (Alternative C) makes the death benefit assumption as the Basic definition, but has premiums paid monthly.

$$
\begin{aligned}
{}_tR_x = {}&{}_{t-1}CV_x + {}_{t-1}TD_x + {}_tP_x\,(\ddot{a}_{\overline{1}|}^{(12)}) \\
&- v(q^D_{x+1-1})({}_tF_x + {}_tTD_x) \\
&- v(1-q^D_{x+t-1})({}_tCV_x + {}_tTD_x) \\
&- v({}_tD_x)
\end{aligned}
$$

Despite the potential for increased refinement, the committee's general position is that it is not "cost effective." No single model will be optimal for every company, and the committee is uncomfortable with the prospect of sanctioning several alternatives. It should be noted, furthermore, that once we start down the road of refined models for the sake of theoretical precision, we may also have to refine the policy value definitions. For example, if the actual death benefit changes throughout the year (as will occur through premium refund or under an "Option B" Universal Life), the amount representing the death benefit in the index calculation would also change to be consistent with the underlying assumption of death claim timing.

These concerns are not new. They were anticipated in the Society Analysis.

> In the past, there has been very little discussion of the deficiencies of various cost comparison methods in terms of product design or of company experience variations. It must be emphasized that while the subjects of comparison and disclosure of life insurance costs have received considerable attention within the life insurance industry, the general public has been relatively unaware of it. Should such public awareness increase, as is likely, the pressure for improved comparative rankings and more attractive products will increase. In that atmosphere, the deficiencies, distortions and problems noted herein will probably deserve increased attention. (p. 172)

In the interest of simplicity, the committee generally favors the Basic definition, in which the policy values (other than the premium) are end-of-year values. In the case of model premium policies, a modification along the lines of Alternative C will be allowed but not mandated. The final definition of the recommended index appears in Section V. (One concern affecting all the definitions is that the unknown yield rate is part of the annual retention formula. This complicates the problems of presentation and calculation. The committee experimented with retention formulas that would eliminate the unknown yield rate, but they all produced tremendous distortions.)

III. Relationship Between The Proposed Yield Index and The Linton Yield

The most prominent yield index used heretofore is probably the Linton Yield, and the committee feels that it will be making a useful contribution to the overall theory of cost comparison techniques by showing how its proposed yield index can be reconciled to the Linton Yield.

As demonstrated, the GPF takes a present value of retentions, and that the proposed yield index uses essentially the same math to solve for the interest rate such that the present value of retentions is zero.

Recall Alternative A, which defined the annual retention as

$$
\begin{aligned}
{}_tR_x = {}_{t-1}CV_x + {}_{t-1}TD_x + {}_tP_x \\
- (q^D_{x+t-1})({}_tF_x + {}_tTD_x) \\
- v(1-q^D_{x+t-1})({}_tCV_x + {}_tTD_x + {}_tD_x)
\end{aligned}
$$

This can be rearranged as an equation for year-to-year progression:

$$
\begin{aligned}
{}_{t-1}CV_x + {}_{t-1}TD_x + {}_tP_x - {}_tR_x \\
= q^D_{x+t-1}({}_tF_x + {}_tTD_x) \\
+ v(1-q^D_{x+t-1})({}_tCV_x + {}_tTD_x + {}_tD_x)
\end{aligned}
$$

Over an "n" year time horizon, there will be "n" such equations. Now, if we set the annual retention equal to zero in each equation, we can solve for each year's interest rate.

$$
i = \frac{(1-q^D_{x+t-1})({}_tCV_x + {}_tTD_x + {}_tD_x)}{{}_{t-1}CV_x + {}_{t-1}TD_x + {}_tP_x - q^D_{x+t-1}({}_tF_x + {}_tTD_x)}
$$

Of course, the interest rate will probably vary by duration. The premise underlying the Linton Yield technique is that, over an "n" year time horizon, we are concerned only with the initial policyholder accumulation

$$
{}_0ACCUM_x = {}_0CV_x + {}_0TD_x = 0
$$

and the final policyholder accumulation

$$
{}_nACCUM_x = {}_nCV_x + {}_nTD_x
$$

We are willing to let the accumulations for durations 1 through (n-1) vary from the actual policy values, and we want to find a single interest rate such that the equation

$$
\begin{aligned}
{}_{t-1}ACCUM_x + {}_tP_x = q^D_{x+t-1}({}_tF_x + {}_tTD_x) \\
+ v(1-q^D_{x+t-1})({}_tACCUM_x + {}_tD_x)
\end{aligned}
$$

is true at all durations. There is a unique solution since there are "n" equations and "n" unknowns (the interest rate and the (n-1) intermediate accumulations). The interest rate that falls out of this solution is the Linton Yield.

The Society Analysis also defines the Linton Yield, although not precisely in these terms and without reconciling it to the GPF. The real substantive difference between the two formulations is that the Society Analysis ignores terminal dividends and ignores the year "n" annual dividend. We will now (1) restate our formulation to make it consistent with these substantive differences, and (2) demonstrate that the restated formulation is mathematically equivalent to the one in the Society Analysis.

Correcting the real substantive differences, our restated formulation is that i is the yield rate which satisfied

$$({}_{t-1}ACCUM_x + {}_tP_x) = q^D_{x+t-1}\,({}_tF_x) + v\,(1 - q^D_{x+t-1})\,({}_tACCUM_x + {}_tD_x) \qquad (C1)$$

for t = 1 to n, such that

$${}_0ACCUM_x = {}_0CV_x = 0$$

$${}_nACCUM_x = {}_nCV_x - {}_nD_x$$

with

$${}_tACCUM_x \quad \text{for} \quad 1 \le t \le n-1$$

being solved as part of the process.

The Society Analysis expresses the Linton Yield in formula form through five equations

$${}_tDIFF_x = {}_tP_x - {}_{t-1}D_x \qquad (S1)$$

$${}_tBFUND_x = {}_{t-1}EFUND_x + {}_tDIFF_x \qquad (S2)$$

$${}_tEFUND_x = ({}_tBFUND_x - {}_tTCHG_x)(1+i) \qquad (S3)$$

$${}_tPROT_x = {}_tF_x - {}_tBFUND_x \qquad (S4)$$

$${}_tTCHG_x = {}_tPROT_x({}_tr_x)/(1 - {}_tr_x) \qquad (S5)$$

where ${}_tr_x = {}_tYRTPREM_x/1000$

and two constraints ${}_0EFUND_x = 0$

${}_nEFUND_x = {}_nCV_x$

where ${}_tBFUND_x$ = savings fund at beginning of year t

${}_tEFUND_x$ = savings fund at end of year t

${}_tTCHG_x$ = term insurance charge for the insurance protection in year t

${}_tYRTPREM_x$ = yearly renewable term premium per $1000 at attained age x + t − 1

i = resulting yield

If we define the substitution

$$ {}_{t}EFUND_{x} = {}_{t}ACCUM_{x} + {}_{t}D_{x} $$

then our equation (C1) becomes

$$ \left({}_{t-1}EFUND_{x} + {}_{t}P_{x} - {}_{t-1}D_{x}\right) = q^{D}_{x+t-1}\left({}_{t}F_{x}\right) + v\left(1 - q^{D}_{x+t-1}\right)\left({}_{t}EFUND_{x}\right) \qquad (C2) $$

Applying Society equations (S1) and (S2), we obtain.

$$ {}_{t}BFUND_{x} = q^{D}_{x+t-1}\left({}_{t}F_{x}\right) + v\left(1 - q^{D}_{x+t-1}\right)\left({}_{t}EFUND_{x}\right) \qquad (C3) $$

Now, subtracting

$$ q^{D}_{x+t-1}\left({}_{t}BFUND_{x}\right) $$

from each side, and dividing each side by

$$ \left(1 - q^{D}_{x+t-1}\right) $$

the result is

$$ {}_{t}BFUND_{x} = \frac{q^{D}_{x+t-1}\left({}_{t}F_{x} - {}_{t}BFUND_{x}\right)}{\left(1 - q^{D}_{x+t-1}\right)} + v\left({}_{t}EFUND_{x}\right) \qquad (C4) $$

The next step is to define

$$ \frac{{}_{t}YRTPREM_{x}}{1000} = q^{D}_{x+t-1} $$

and combine (S4) and (S5) to yield

$$ {}_{t}TCHG_{x} = \frac{q^{D}_{x+t-1}}{\left(1 - q^{D}_{x+t-1}\right)}\left({}_{t}F_{x} - {}_{t}BFUND_{x}\right) \qquad (C5) $$

Thus, equation (C4) incorporates our initial equation (C1) and Society equations (S1) and (S2). Equation (C5) incorporates Society equations (S4) and (S5). Combining equations (C4) and (C5), we have

$$ {}_{t}BFUND_{x} = {}_{t}TCHG_{x} + v\left({}_{t}EFUND_{x}\right) $$

which is identical to Society equation (S3) and thus establishes the tautology between our formulation and the Society formulation.

IV. Standardized Value of Death Protection

As part of its work on the Linton Yield, the Society Analysis addressed the matter of defining standardized term charges. It established three formulas—for "low," "average," and "high" yearly renewable term ("YRT") premiums.

Low YRT Premiums	$= (1000\ q_x)\ (.95) + \$.90 + \$25/S$
Average YRT Premiums	$= (1000\ q_x)\ (1.05) + \$1.20 + \$25/S$
High YRT Premiums	$= (1000\ q_x)\ (1.15) + \$1.50 + \$25/S$

Where q_x is the mortality rate for age x from the Ultimate Basic Table based on an inter-company study of males, lives, 1957-1960 experience, Transactions of the Society of Actuaries, 1962 Reports, P. 48, and S is the policy size in thousands.

The committee determined that this type of standardized formula represented an attractive approach, but decided to base its standardized value of death protection ("SVDP") on the 1980 CSO Basic tables for the four key sex and smoking status groups—Male Nonsmokers, Male Smokers, Female Nonsmokers, Female Smokers. In addition, the committee found that the use of a select mortality assumption is necessary to prevent distortions at the higher issue ages.

Thus, the Committee's final definition of the SVDP is SVDP

$$SVDP_t = .95\, q_{x,t} + .70 + \frac{35}{S}$$

where $q_{x,t}$ is the select and ultimate mortality per 1000 for an individual with issue age x in policy year t, using the 1980 CSO Basic Table for the sex and smoking status in the policy, and the 1980 CSO Graded Select Factors. The Age Nearest Birthday tables and select factors and the resulting select and ultimate rates, are included as Attachment A to this memorandum. Age Last Birthday values can be obtained through linear interpolation.

The resulting SVDP values are generally consistent with available One Year Term rates. They are low, but not the lowest.

The resulting Yield Indexes can vary widely, but there is no uniform set of term charges that will prevent this.

V. Proposed Overall Formula

The committee's final proposal is essentially the Basic definition in Section II, with certain elements redefined.

Specifically,

1. The proposed index assumes that dividends (if any) are applied to purchase paid-up additions (i.e., they are not paid in cash) and that there are no other cash withdrawals. Thus any dividends are included in the illustrated death benefit.

2. The proposal defines retention as an "end-of-year" value and discounts it accordingly.

3. The Yield Index is defined on both an Illustrated Basis and a Guaranteed Basis.

Thus, the Life Insurance Yield Comparison Index-Illustrated Basis over "n" years is the interest rate at which

$$0 = \sum_{t=1}^{n} \left(\frac{1}{1+i}\right)^t SAR_t$$

where

SAR_t = Standardized Annual Retention-Illustrated Basis for policy year t

$= (P_t + ICV_{t-1})(1+i) - ICV_t$

$- SVDP_t (.001)(IDB_t - ICV_t)$

P_t = Total premium for policy year t

ICV_t = Illustrated Cash value at end of policy year t

ICV_{t-1} = Illustrated Cash value at end of policy year (t-1)

IDB_t = Illustrated Death Benefit for policy year t

i = Yield Index Rate

The Life Insurance Yield Comparison Index - Guaranteed Basis is defined analagously using guaranteed values. The definitions are set forth in complete detail in the Proposed Yield Index Amendments to the Life Insurance Disclosure Model Regulation.

The committee recognizes that the formula's implicit assumption of an annual premium mode can have a significant impact where the mode is other than annual. Thus, the formula for the Standardized Annual Retention - Illustrated Basis can be modified to

$$\begin{aligned} SAR_t = {} & 1CV_{t-1}(1+i) \\ & + P_t(1+i(\tfrac{m+1}{2m})) \\ & - 1CV_t \\ & - SVDP_t(.001)(1DB_t - 1CV_t) \end{aligned}$$

where m is the Premium Payment Frequency. This approximates Alternative C, presented in Section II. Of course, an analogous modification is possible for the Guaranteed Basis.

VI. Iterative Solution Technique

The mathematical problem involves finding a value, i, such that a function of that i (the present value of retentions) equals zero. In other words, find i such that F(i) = O.

This falls within the general definition of problems using Newton-Raphson iteration.

Under the Newton-Raphson technique, an initial guess at the solution, i_1, will lead to a closer value, i_2, according to the formula

$$i_2 = i_1 - \frac{F(i_1)}{F^1(i_1)}$$

More generally,

$$i_{r+1} = i_r - \frac{F(i_r)}{F^1(i_r)}$$

where $F'(i_r)$ is the derivative with respect to i at value i_r. In most solvable cases with reasonable initial guesses, the solution will be found with a few iterations (r less than 10).

Since it is inconvenient to mathematically differentiate the present value of retentions, approximate differentiation is also recommended. If d is "small" (e.g., 0.000005), we can say

$$F'(i_r) = \frac{F(i_r + d) - F(i_r)}{d}$$

The Newton-Raphson algorithm thus becomes

$$i_{r+1} = \frac{i_r\, F(i_r+d) - (i_r+d)\, F(i_r)}{F(i_r+d) - F(i_r)}$$

In or the words, find the present value of retentions using the initial guess and the initial guess plus d. Apply the algorithm to get the second value. Repeat until

$$i_{r+1} \approx i_r$$

****

ATTACHMENT A

The value of $q_{x,t}$ that appears in the definition of the Standardized Value of Death Protection is a select and ultimate value that is computed as

$$q_{x,t} = (q^u_{x+t-1})(sel_{x,t})$$

where

q^u_{x+t-1} = the ultimate probability of mortality per 1000 for a person age $(x+t-1)$ under the 1980 CSO Basic Table that corresponds to the sex and smoking status in the policy.

$sel_{x,t}$ = The 1980 CSO Graded Select Factor corresponding to the sex in the policy.

= 1 for $t > 10$

Attached Table 1 sets forth the ultimate 1980 CSO Basic values, and Tables 2 and 3 are the Male and Female 1980 CSO Graded Select Factors, respectively. Table 2 also can be generated by linear interpolation using pivotal ages 17, 22, 37, 42, 47, 52, 62 and 67. Table 3 also can be generated by linear interpolation using pivotal ages 17, 22, 27, 32, 42, 47, 52, 57, 62, 67 and 72.

Instead of deriving the $q_{x,t}$ values mathematically with Tables 1, 2 and 3, the values can be read directly from Tables 4, 5, 6 and 7, for the different sex and smoking status classifications.

Table 1

1980 CSO
BASIC
AGE NEAREST BIRTHDAY

AGE	MALE NSM	MALE SMK	FEMALE NSM	FEMALE SMK
15	.73	1.08	.32	.42
16	.88	1.30	.35	.46
17	.96	1.47	.38	.50
18	1.01	1.57	.41	.55
19	1.06	1.65	.43	.58
20	1.08	1.69	.44	.59
21	1.04	1.70	.44	.60
22	1.01	1.68	.45	.62
23	.95	1.60	.45	.63
24	.90	1.54	.46	.65
25	.83	1.45	.46	.66
26	.77	1.37	.47	.69
27	.73	1.33	.48	.72
28	.69	1.29	.49	.74
29	.67	1.29	.50	.78
30	.65	1.31	.52	.83
31	.65	1.35	.53	.87
32	.66	1.40	.55	.92
33	.68	1.46	.57	.97
34	.71	1.53	.61	1.05
35	.76	1.70	.64	1.11
36	.81	1.85	.70	1.23
37	.89	2.06	.78	1.38
38	.97	2.27	.87	1.57
39	1.07	2.53	.98	1.78
40	1.18	2.83	1.10	2.02
41	1.31	3.18	1.24	2.31
42	1.45	3.55	1.38	2.58
43	1.61	3.97	1.52	2.86
44	1.77	4.41	1.68	3.14
45	1.95	4.81	1.80	3.42
46	2.17	5.41	1.96	3.72
47	2.40	5.96	2.13	4.03
48	2.64	6.53	2.31	4.34
49	2.91	7.17	2.50	4.68
50	3.21	7.68	2.73	5.06
51	3.56	8.65	2.96	5.48
52	3.95	9.54	3.26	5.93
53	4.48	10.57	3.58	6.46
54	5.01	11.72	3.93	7.00
55	5.63	12.95	4.30	7.57
56	6.32	14.28	4.67	8.13
57	7.06	15.66	5.03	8.65
58	7.86	17.12	5.37	9.13
59	8.75	18.62	5.72	9.61
60	9.76	20.31	6.15	10.15
61	10.89	22.21	6.67	10.87
62	12.18	24.35	7.35	11.76
63	13.67	26.79	8.22	12.99
64	15.36	29.48	9.27	14.37
65	17.23	32.39	10.41	15.93
66	19.25	35.42	11.64	17.46
67	21.43	38.58	12.86	19.03
68	23.76	41.81	14.08	20.42
69	26.31	45.25	15.37	21.86
70	29.19	49.04	16.88	23.63
71	32.47	53.25	18.71	25.82
72	36.29	58.06	21.01	28.57
73	40.69	63.48	23.86	31.97
74	45.65	69.39	27.24	35.96
75	50.96	75.93	31.07	40.39
76	56.61	82.65	35.28	45.16
77	62.52	89.40	39.79	50.14
78	68.16	96.05	44.58	55.28
79	75.06	102.83	49.80	60.76
80	82.11	110.03	55.69	66.83
81	89.98	117.87	62.45	73.69
82	98.68	126.56	70.30	81.55
83	108.94	136.16	79.37	90.46
84	119.94	146.32	89.41	101.03
85	131.58	156.58	100.38	111.42
86	143.61	166.59	112.05	123.26
87	155.87	176.14	124.46	134.42
88	168.06	186.54	137.43	147.05
89	180.33	196.56	151.12	158.68
90	192.60	206.30	165.44	172.06
91	205.61	215.89	180.62	186.04
92	219.07	225.65	196.99	200.93
93	233.60	238.27	215.20	217.35
94	250.72	253.22	236.52	236.52
95	273.02	273.02	263.38	263.38
96	309.92	309.92	301.01	301.01
97	367.46	367.46	359.86	359.86
98	470.80	470.80	462.34	462.34
99	656.70	656.70	647.43	647.43

Table 2

1980 CSO
MALE
GRADED SELECTION FACTORS

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	.85	.88	.87	.95	.95	.99	.99	.99	.99	.99	1.00
19	.80	.82	.84	.96	.96	.88	.88	.98	.98	.98	1.00
20	.85	.88	.91	.94	.94	.97	.97	.97	.97	.97	1.00
21	.80	.84	.88	.92	.92	.96	.96	.96	.96	.96	1.00
22	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
23	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
24	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
25	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
26	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
27	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
28	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
29	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
30	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
31	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
32	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
33	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
34	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
35	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
36	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
37	.75	.80	.85	.90	.90	.95	.95	.95	.95	.95	1.00
38	.74	.79	.84	.89	.89	.94	.95	.95	.95	.95	1.00
39	.73	.78	.83	.88	.88	.93	.95	.95	.95	.95	1.00
40	.72	.77	.82	.87	.87	.92	.95	.95	.95	.95	1.00
41	.71	.76	.81	.86	.86	.91	.95	.95	.95	.95	1.00
42	.70	.75	.80	.85	.85	.90	.95	.95	.95	.95	1.00
43	.68	.74	.79	.84	.84	.89	.94	.94	.94	.95	1.00
44	.66	.73	.78	.83	.83	.88	.93	.93	.93	.94	1.00
45	.67	.72	.77	.82	.82	.87	.92	.92	.92	.94	1.00
46	.66	.71	.76	.81	.81	.86	.91	.91	.91	.93	1.00
47	.65	.70	.75	.80	.80	.85	.90	.90	.90	.93	1.00
48	.64	.69	.74	.79	.79	.84	.89	.89	.90	.93	1.00
49	.63	.68	.73	.78	.78	.83	.88	.88	.89	.93	1.00
50	.63	.67	.72	.77	.77	.82	.87	.87	.89	.93	1.00
51	.62	.66	.71	.76	.76	.81	.86	.86	.88	.93	1.00
52	.61	.65	.70	.75	.75	.80	.85	.85	.88	.93	1.00
53	.60	.64	.69	.74	.74	.79	.84	.85	.88	.93	1.00
54	.59	.63	.68	.73	.73	.78	.83	.85	.88	.93	1.00

Table 2

1980 CSO
MALE
GRADED SELECTION FACTORS

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
55	.50	.62	.67	.72	.72	.77	.82	.85	.88	.93	1.00
56	.57	.61	.66	.71	.71	.76	.81	.85	.88	.93	1.00
57	.56	.60	.65	.70	.70	.75	.80	.85	.88	.93	1.00
58	.55	.59	.64	.69	.69	.74	.79	.84	.86	.93	1.00
59	.54	.56	.63	.68	.68	.73	.78	.83	.87	.93	1.00
60	.54	.58	.62	.67	.67	.72	.77	.82	.87	.93	1.00
61	.53	.57	.61	.66	.66	.71	.76	.81	.86	.93	1.00
62	.52	.56	.60	.65	.65	.70	.75	.80	.86	.93	1.00
63	.51	.55	.59	.64	.64	.69	.74	.79	.85	.92	1.00
64	.50	.54	.58	.63	.63	.68	.73	.78	.84	.92	1.00
65	.50	.54	.57	.62	.62	.67	.72	.78	.84	.91	1.00
66	.49	.53	.56	.61	.61	.66	.71	.77	.83	.91	1.00
67	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
68	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
69	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
70	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
71	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
72	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
73	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
74	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
75	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
76	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
77	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
78	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
79	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
80	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
81	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
82	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
83	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
84	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
85	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
86	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
87	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
88	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00
89	.48	.52	.55	.60	.60	.65	.70	.76	.82	.90	1.00

1980 CSO
FEMALE
GRADED SELECTION FACTORS

Table

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	.99	.99	.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
19	.98	.98	.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	.98	.98	.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
21	.97	.97	.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	.96	.96	.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
23	.96	.96	.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	.96	.96	.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25	.96	.96	.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
26	.96	.96	.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27	.96	.96	.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
28	.95	.95	.96	.99	.99	1.00	1.00	1.00	1.00	1.00	1.00
29	.94	.94	.96	.98	.98	1.00	1.00	1.00	1.00	1.00	1.00
30	.94	.94	.96	.98	.98	1.00	1.00	1.00	1.00	1.00	1.00
31	.93	.93	.96	.97	.97	1.00	1.00	1.00	1.00	1.00	1.00
32	.92	.92	.96	.96	.96	1.00	1.00	1.00	1.00	1.00	1.00
33	.91	.91	.95	.96	.96	.99	.99	1.00	1.00	1.00	1.00
34	.90	.90	.94	.96	.96	.99	.98	1.00	1.00	1.00	1.00
35	.90	.90	.94	.96	.96	.98	.98	1.00	1.00	1.00	1.00
36	.89	.89	.93	.96	.96	.97	.97	1.00	1.00	1.00	1.00
37	.88	.88	.92	.96	.96	.96	.96	1.00	1.00	1.00	1.00
38	.87	.87	.91	.95	.95	.95	.95	.99	.99	.99	1.00
39	.88	.88	.90	.94	.94	.94	.94	.98	.98	.98	1.00
40	.88	.88	.90	.94	.94	.94	.94	.97	.97	.97	1.00
41	.86	.86	.89	.93	.93	.93	.93	.96	.96	.96	1.00
42	.84	.84	.88	.92	.92	.92	.92	.95	.95	.95	1.00
43	.83	.83	.87	.91	.91	.91	.91	.94	.94	.95	1.00
44	.82	.82	.88	.90	.90	.90	.90	.93	.93	.94	1.00
45	.82	.82	.88	.90	.90	.90	.90	.92	.92	.94	1.00
46	.81	.81	.85	.89	.89	.89	.89	.91	.91	.93	1.00
47	.80	.80	.84	.88	.88	.88	.88	.90	.90	.93	1.00
48	.79	.79	.83	.87	.87	.87	.87	.89	.90	.93	1.00
49	.78	.78	.82	.86	.88	.86	.86	.88	.89	.93	1.00
50	.78	.78	.82	.86	.86	.86	.86	.87	.89	.93	1.00
51	.77	.77	.81	.85	.85	.85	.85	.86	.88	.93	1.00
52	.76	.76	.80	.84	.84	.84	.84	.85	.88	.93	1.00
53	.75	.75	.79	.83	.83	.83	.83	.84	.88	.93	1.00
54	.74	.74	.78	.82	.82	.82	.82	.83	.87	.93	1.00

Table 3

1980 CSO
FEMALE
GRADED SELECTION FACTORS

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
55	.74	.74	.78	.82	.82	.82	.82	.82	.87	.92	1.00
56	.73	.73	.77	.81	.81	.81	.81	.81	.86	.92	1.00
57	.72	.72	.76	.80	.80	.80	.80	.80	.86	.92	1.00
58	.71	.71	.75	.79	.79	.79	.80	.80	.86	.92	1.00
59	.70	.70	.74	.78	.78	.78	.80	.80	.86	.92	1.00
60	.70	.70	.74	.78	.78	.78	.80	.80	.86	.92	1.00
61	.69	.69	.73	.77	.77	.77	.80	.80	.86	.92	1.00
62	.68	.68	.72	.76	.76	.76	.80	.80	.86	.92	1.00
63	.67	.67	.71	.75	.75	.75	.78	.80	.86	.92	1.00
64	.66	.66	.70	.74	.74	.74	.78	.80	.86	.92	1.00
65	.66	.66	.70	.74	.74	.74	.77	.80	.85	.92	1.00
66	.65	.65	.69	.73	.73	.73	.76	.80	.85	.92	1.00
67	.64	.64	.68	.72	.72	.72	.75	.80	.85	.92	1.00
68	.63	.63	.67	.71	.71	.72	.75	.80	.85	.92	1.00
69	.62	.62	.66	.70	.70	.72	.75	.80	.85	.92	1.00
70	.62	.62	.66	.70	.70	.72	.75	.79	.84	.91	1.00
71	.61	.61	.65	.69	.69	.72	.75	.79	.84	.91	1.00
72	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
73	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
74	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
75	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
76	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
77	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
78	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
79	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
80	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
81	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
82	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
83	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
84	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
85	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
86	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
87	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
88	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00
89	.60	.60	.64	.68	.68	.72	.75	.79	.84	.91	1.00

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
MALE NONSMOKER
SELECT AND ULTIMATE MORTALITY

Table 4

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
15	.73	.86	.96	1.01	1.05	1.06	1.04	1.01	.95	.90	.83
16	.89	.96	1.01	1.05	1.06	1.04	1.01	.95	.90	.83	.77
17	.96	1.01	1.05	1.06	1.04	1.01	.95	.90	.83	.77	.73
18	.96	1.01	1.03	1.02	.99	.94	.89	.82	.76	.72	.69
19	.96	.96	.98	.97	.91	.88	.81	.75	.73	.68	.67
20	.90	.92	.92	.89	.85	.81	.75	.71	.67	.65	.65
21	.83	.85	.84	.83	.78	.74	.70	.66	.64	.62	.65
22	.78	.78	.77	.75	.69	.69	.66	.64	.62	.62	.66
23	.71	.72	.71	.69	.66	.66	.64	.62	.62	.63	.68
24	.68	.68	.65	.66	.62	.64	.62	.62	.63	.65	.71
25	.62	.62	.62	.62	.60	.62	.62	.63	.65	.67	.76
26	.56	.56	.58	.60	.59	.62	.63	.65	.67	.72	.81
27	.55	.55	.57	.58	.59	.63	.65	.67	.72	.77	.89
28	.52	.54	.56	.58	.59	.65	.67	.72	.77	.85	.97
29	.50	.52	.55	.59	.61	.67	.72	.77	.85	.92	1.07
30	.49	.52	.56	.61	.64	.72	.77	.85	.92	1.02	1.18
31	.48	.53	.58	.64	.68	.77	.85	.92	1.02	1.12	1.31
32	.50	.54	.60	.65	.73	.85	.92	1.02	1.12	1.24	1.45
33	.51	.57	.65	.73	.80	.92	1.02	1.12	1.24	1.38	1.61
34	.53	.61	.68	.80	.87	1.02	1.12	1.24	1.38	1.53	1.77
35	.57	.65	.76	.87	.98	1.12	1.24	1.38	1.53	1.68	1.96
36	.61	.71	.82	.96	1.08	1.24	1.38	1.53	1.68	1.86	2.17
37	.67	.78	.91	1.06	1.18	1.38	1.53	1.68	1.86	2.06	2.40
38	.72	.85	.99	1.17	1.29	1.51	1.68	1.86	2.06	2.28	2.64
39	.78	.92	1.08	1.28	1.42	1.65	1.86	2.06	2.28	2.51	2.91
40	.85	1.01	1.19	1.40	1.54	1.80	2.06	2.28	2.51	2.76	3.21
41	.93	1.10	1.30	1.52	1.69	1.97	2.28	2.51	2.76	3.05	3.56
42	1.02	1.21	1.42	1.67	1.84	2.15	2.51	2.76	3.05	3.36	3.98
43	1.11	1.31	1.55	1.82	2.02	2.35	2.74	3.02	3.35	3.76	4.46
44	1.20	1.43	1.69	1.99	2.19	2.56	2.99	3.31	3.70	4.18	5.01
45	1.31	1.56	1.85	2.18	2.39	2.79	3.28	3.66	4.10	4.71	5.63
46	1.43	1.70	2.01	2.38	2.60	3.06	3.62	4.06	4.56	5.24	6.32
47	1.56	1.85	2.19	2.57	2.85	3.38	4.01	4.51	5.07	5.88	7.06
48	1.69	2.01	2.38	2.81	3.14	3.75	4.46	5.01	5.69	6.57	7.88
49	1.83	2.18	2.60	3.10	3.46	4.16	4.95	5.56	6.26	7.30	8.78
50	2.02	2.39	2.87	3.43	3.86	4.62	5.50	6.14	6.98	8.14	9.78
51	2.21	2.63	3.17	3.81	4.28	5.12	6.07	6.75	7.70	9.06	10.89
52	2.43	2.90	3.51	4.22	4.74	5.65	6.67	7.44	8.59	10.13	12.18
53	2.68	3.21	3.89	4.68	5.22	6.20	7.35	8.30	9.58	11.33	13.67
54	2.96	3.55	4.30	5.15	5.73	6.83	8.10	9.26	10.72	12.71	15.30

Table 4

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
MALE NONSMOKER
SELECT AND ULTIMATE MORTALITY

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
55	3.27	3.92	4.73	5.65	6.30	7.52	8.93	10.35	12.03	14.28	17.23
56	3.60	4.31	5.19	6.21	6.93	8.28	9.87	11.62	13.52	16.02	19.25
57	3.95	4.71	5.69	6.83	7.62	9.14	10.94	13.06	15.18	17.90	21.43
58	4.32	5.19	6.25	7.51	8.40	10.12	12.13	14.47	16.94	19.93	23.76
59	4.73	5.69	6.86	8.28	9.30	11.21	13.44	15.98	18.84	22.10	26.31
60	5.27	6.32	7.55	9.16	10.28	12.41	14.82	17.67	20.87	24.47	29.19
61	5.77	6.94	8.34	10.14	11.37	13.67	16.29	19.25	22.83	27.15	32.47
62	6.33	7.66	9.22	11.20	12.51	15.00	17.82	21.05	25.10	30.20	36.29
63	6.97	8.45	10.17	12.32	13.72	16.38	19.47	23.06	27.60	33.39	40.69
64	7.68	9.30	11.17	13.50	14.97	17.88	21.31	25.33	30.48	37.43	45.65
65	8.62	10.40	12.22	14.73	16.31	19.58	23.38	28.31	34.18	41.54	50.98
66	9.43	11.38	13.31	16.05	17.81	21.43	25.77	31.33	37.69	46.37	56.61
67	10.28	12.38	14.47	17.51	19.48	23.59	28.48	34.69	41.79	50.95	62.52
68	11.40	13.66	16.05	19.48	21.77	26.46	31.66	38.73	46.42	56.27	68.16
69	12.63	15.15	17.86	21.77	24.41	29.67	35.57	43.02	51.27	61.34	75.06
70	14.01	16.88	19.96	24.41	27.39	33.12	39.63	47.52	55.88	67.55	82.11
71	15.58	18.87	22.36	27.39	30.58	36.80	43.76	51.80	61.55	73.90	89.98
72	17.42	21.16	25.11	30.58	33.87	40.64	47.71	57.05	67.33	80.98	98.58
73	19.53	23.74	28.03	33.87	37.51	44.30	52.54	62.40	73.78	88.99	108.94
74	21.91	26.50	31.14	37.51	40.90	48.79	57.46	68.38	81.08	98.05	119.84
75	24.46	29.44	34.38	40.90	45.04	53.37	62.99	75.15	89.33	107.85	131.58
76	27.17	32.51	37.49	45.04	49.27	58.49	69.22	82.78	98.35	118.42	143.61
77	30.01	35.64	41.28	49.27	53.89	64.27	76.26	91.15	107.90	129.25	155.87
78	32.72	39.03	45.16	53.89	59.33	70.61	83.96	100.00	117.76	140.28	168.06
79	36.03	42.70	49.49	59.33	65.36	77.96	92.11	109.14	127.81	151.25	180.33
80	39.41	46.79	54.36	65.36	71.98	85.53	100.53	118.46	137.81	162.30	192.80
81	43.16	51.42	59.92	71.98	78.95	93.35	109.11	127.73	147.87	173.52	205.81
82	47.46	56.65	65.87	78.95	86.17	101.32	117.64	137.05	156.10	185.05	219.07
83	52.29	62.37	72.37	86.17	93.52	109.24	126.23	146.53	166.60	197.18	233.60
84	57.57	68.42	78.89	93.52	100.84	117.21	134.96	156.26	179.64	210.24	250.72
85	63.16	74.68	85.73	100.84	108.20	125.32	143.93	166.49	191.55	225.65	273.02
86	68.93	81.05	92.43	108.20	115.68	133.65	153.35	177.54	205.59	245.72	309.02
87	74.82	87.39	99.18	115.68	123.37	142.40	163.52	190.55	223.68	278.93	367.46
88	80.87	93.77	106.04	123.37	131.44	151.84	175.50	207.50	254.13	330.71	470.80
89	86.58	100.28	113.09	131.44	140.16	162.97	191.11	235.54	301.32	423.72	658.70

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
MALE SMOKER
SELECT AND ULTIMATE MORTALITY

Table 5

ISS	POL YEAR										
AGE	1	2	3	4	5	6	7	8	9	10	ULT
15	1.09	1.30	1.47	1.57	1.65	1.68	1.70	1.66	1.60	1.54	1.45
16	1.30	1.47	1.57	1.65	1.68	1.70	1.66	1.60	1.54	1.45	1.37
17	1.47	1.57	1.65	1.68	1.70	1.66	1.60	1.54	1.45	1.37	1.33
18	1.48	1.58	1.64	1.67	1.63	1.58	1.52	1.44	1.36	1.32	1.28
19	1.49	1.56	1.60	1.59	1.54	1.51	1.42	1.34	1.30	1.26	1.25
20	1.44	1.50	1.51	1.50	1.45	1.41	1.33	1.29	1.25	1.25	1.31
21	1.36	1.38	1.41	1.42	1.33	1.32	1.28	1.24	1.24	1.26	1.35
22	1.25	1.28	1.31	1.31	1.23	1.26	1.23	1.23	1.24	1.28	1.40
23	1.20	1.23	1.23	1.23	1.20	1.23	1.23	1.24	1.26	1.33	1.48
24	1.16	1.16	1.16	1.20	1.16	1.23	1.24	1.28	1.33	1.41	1.58
25	1.09	1.10	1.13	1.16	1.16	1.24	1.28	1.33	1.41	1.50	1.70
26	1.03	1.06	1.10	1.16	1.18	1.26	1.33	1.41	1.50	1.62	1.88
27	1.00	1.03	1.10	1.18	1.22	1.33	1.41	1.50	1.62	1.76	2.06
28	.97	1.03	1.11	1.22	1.28	1.41	1.50	1.62	1.78	1.95	2.27
29	.97	1.06	1.16	1.26	1.33	1.50	1.62	1.76	1.95	2.16	2.53
30	.98	1.09	1.19	1.33	1.42	1.62	1.76	1.95	2.16	2.40	2.83
31	1.01	1.12	1.28	1.42	1.53	1.76	1.95	2.16	2.40	2.69	3.18
32	1.05	1.18	1.34	1.53	1.67	1.95	2.16	2.40	2.69	3.02	3.55
33	1.11	1.28	1.45	1.67	1.85	2.16	2.40	2.69	3.02	3.37	3.97
34	1.18	1.38	1.57	1.85	2.04	2.40	2.69	3.02	3.37	3.77	4.41
35	1.28	1.48	1.74	2.04	2.28	2.69	3.02	3.37	3.77	4.19	4.91
36	1.39	1.64	1.93	2.28	2.55	3.02	3.37	3.77	4.19	4.66	5.41
37	1.54	1.82	2.15	2.55	2.86	3.37	3.77	4.19	4.66	5.14	5.96
38	1.68	2.00	2.38	2.83	3.16	3.73	4.19	4.66	5.14	5.66	6.53
39	1.85	2.21	2.64	3.12	3.49	4.10	4.66	5.14	5.66	6.20	7.17
40	2.04	2.45	2.91	3.45	3.84	4.52	5.14	5.66	6.20	6.81	7.86
41	2.26	2.70	3.22	3.79	4.22	4.92	5.66	6.20	6.81	7.47	8.65
42	2.49	2.98	3.53	4.17	4.60	5.36	6.20	6.81	7.47	8.22	9.54
43	2.74	3.28	3.88	4.54	5.01	5.81	6.74	7.39	8.13	9.06	10.57
44	3.00	3.58	4.22	4.95	5.42	6.31	7.31	8.04	8.87	9.94	11.72
45	3.29	3.90	4.59	5.35	5.88	6.84	7.96	8.78	9.72	11.02	12.96
46	3.67	4.23	4.96	5.81	6.37	7.44	8.66	9.62	10.67	12.04	14.28
47	3.87	4.67	5.36	6.29	6.92	8.11	9.51	10.55	11.66	13.28	15.66
48	4.18	4.95	5.82	6.83	7.54	8.86	10.43	11.53	12.85	14.58	17.12
49	4.52	5.34	6.31	7.44	8.24	9.73	11.40	12.57	13.94	16.02	18.83
50	4.85	5.80	6.87	8.14	9.02	10.62	12.42	13.62	15.24	17.33	20.31
51	5.36	6.30	7.60	8.91	9.84	11.57	13.47	14.72	16.39	18.88	22.21
52	5.82	6.87	8.20	9.71	10.71	12.53	14.55	15.84	17.87	20.66	24.35
53	6.34	7.50	8.94	10.67	11.88	13.92	15.65	17.28	19.54	22.65	26.78
54	6.91	8.16	9.71	11.43	12.50	14.53	16.66	18.88	21.43	24.91	29.48

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
MALE SMOKER
SELECT AND ULTIMATE MORTALITY

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
55	7.51	8.85	10.49	12.33	13.41	15.64	18.21	20.70	23.58	27.42	32.39
56	8.14	9.55	11.30	13.23	14.42	16.88	19.72	22.77	25.94	30.12	35.42
57	8.77	10.27	12.11	14.22	15.55	18.26	21.43	25.06	28.50	32.94	38.58
58	9.42	10.99	13.00	15.32	16.80	19.82	23.28	27.21	31.17	35.88	41.81
59	10.08	11.78	13.99	16.56	18.22	21.52	25.26	29.40	33.58	38.88	45.25
60	10.87	12.88	15.10	17.95	19.75	23.32	27.27	31.64	36.37	42.08	48.04
61	11.77	13.88	16.34	19.46	21.38	25.15	29.32	33.87	38.92	45.81	53.25
62	12.68	15.00	17.69	21.05	23.02	27.01	31.38	36.20	42.17	49.52	58.08
63	13.68	16.21	19.11	22.87	24.89	28.85	33.49	38.74	45.28	53.42	63.48
64	14.74	17.49	20.54	24.31	26.34	30.77	35.60	41.54	48.77	58.40	69.39
65	16.20	19.13	21.99	25.92	28.06	32.88	38.34	45.29	53.32	63.14	75.93
66	17.38	20.45	23.41	27.60	29.91	35.15	41.22	48.98	57.59	69.10	82.65
67	18.52	21.74	24.88	29.42	31.95	37.74	44.44	52.74	62.28	74.39	89.40
68	20.07	23.53	26.97	31.95	34.84	41.26	48.57	57.71	67.77	80.46	96.06
69	21.72	25.50	29.29	34.84	38.06	45.10	53.15	62.81	73.31	86.46	102.83
70	23.54	27.69	31.83	38.09	41.63	49.35	57.86	67.94	78.78	92.55	110.03
71	25.56	30.19	34.61	41.63	45.58	53.72	62.85	73.00	84.32	99.03	117.87
72	27.87	33.01	38.16	45.56	49.59	58.11	67.24	78.15	90.22	106.08	126.56
73	30.47	36.06	41.78	49.59	53.84	62.43	71.98	83.62	96.65	113.90	136.18
74	33.31	38.48	45.46	53.84	57.83	66.84	77.02	88.58	103.79	122.59	146.32
75	36.45	42.98	49.17	57.83	61.70	71.52	82.51	95.19	111.67	131.69	156.58
76	39.67	46.49	52.83	61.70	66.02	76.62	88.59	103.50	119.88	140.82	166.58
77	42.91	49.95	56.56	66.02	70.72	82.28	95.33	111.20	128.40	148.83	176.14
78	46.10	53.47	60.52	70.72	75.94	88.52	102.42	119.00	136.60	158.53	186.54
79	49.36	57.22	64.83	75.84	81.71	95.11	109.81	128.61	144.43	167.89	196.56
80	52.81	61.29	69.61	81.71	87.79	101.78	118.61	133.87	152.96	176.90	206.30
81	56.58	65.81	74.90	87.79	93.95	108.29	123.30	141.77	161.18	185.87	215.89
82	60.78	70.81	80.48	93.85	99.95	114.49	130.58	149.38	169.17	194.30	225.65
83	65.37	76.09	86.12	99.85	106.88	121.25	137.58	158.79	177.03	203.09	238.27
84	70.23	81.42	91.62	105.68	111.92	127.76	144.41	164.08	186.03	214.44	253.22
85	75.18	86.63	96.88	111.92	117.84	134.10	151.12	171.49	195.38	227.90	273.02
86	79.98	91.58	102.60	117.94	123.78	140.33	157.98	181.09	207.64	245.72	308.92
87	84.55	97.00	108.11	123.78	129.53	146.67	166.79	192.45	223.88	278.93	367.46
88	88.84	102.21	113.47	129.53	135.39	154.88	177.25	207.50	264.13	330.71	470.80
89	94.35	107.26	118.74	135.39	142.06	164.59	191.11	235.54	301.32	423.72	656.70

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
FEMALE NONSMOKER
SELECT AND ULTIMATE MORTALITY

Table 6

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
15	.32	.35	.38	.41	.43	.44	.44	.45	.45	.46	.46
16	.35	.38	.41	.43	.44	.44	.45	.45	.46	.46	.47
17	.38	.41	.43	.44	.44	.45	.45	.46	.46	.47	.48
18	.41	.43	.44	.44	.45	.45	.46	.46	.47	.48	.49
19	.42	.43	.43	.45	.45	.46	.46	.47	.48	.49	.50
20	.43	.43	.44	.45	.46	.46	.47	.48	.49	.50	.52
21	.43	.44	.44	.46	.46	.47	.48	.49	.50	.52	.53
22	.43	.43	.44	.46	.47	.48	.49	.50	.52	.53	.55
23	.43	.44	.44	.47	.48	.49	.50	.52	.53	.55	.57
24	.44	.44	.45	.48	.49	.50	.52	.53	.55	.57	.61
25	.44	.45	.46	.49	.50	.52	.53	.55	.57	.61	.64
26	.45	.46	.47	.50	.52	.53	.55	.57	.61	.64	.70
27	.46	.47	.48	.52	.53	.55	.57	.61	.64	.70	.78
28	.47	.48	.50	.52	.54	.57	.61	.64	.70	.78	.87
29	.47	.49	.51	.54	.56	.61	.64	.70	.78	.87	.98
30	.48	.50	.53	.56	.60	.64	.70	.78	.87	.98	1.10
31	.49	.51	.55	.59	.62	.70	.78	.87	.98	1.10	1.24
32	.51	.52	.56	.61	.67	.78	.87	.98	1.10	1.24	1.38
33	.52	.56	.61	.67	.75	.86	.87	1.10	1.24	1.38	1.52
34	.55	.58	.66	.75	.84	.96	1.06	1.24	1.38	1.52	1.66
35	.58	.63	.73	.84	.94	1.06	1.22	1.36	1.52	1.66	1.80
36	.62	.68	.81	.94	1.06	1.20	1.34	1.52	1.66	1.80	1.96
37	.66	.77	.90	1.06	1.19	1.32	1.46	1.66	1.80	1.96	2.13
38	.76	.85	1.00	1.18	1.31	1.44	1.58	1.76	1.94	2.11	2.31
39	.84	.96	1.12	1.30	1.43	1.56	1.69	1.92	2.09	2.28	2.50
40	.95	1.07	1.24	1.43	1.58	1.69	1.84	2.07	2.24	2.43	2.73
41	1.06	1.17	1.36	1.54	1.67	1.82	1.98	2.22	2.40	2.62	2.96
42	1.16	1.28	1.46	1.66	1.80	1.96	2.13	2.38	2.58	2.83	3.20
43	1.28	1.38	1.56	1.76	1.94	2.10	2.28	2.57	2.80	3.10	3.50
44	1.38	1.48	1.66	1.92	2.08	2.25	2.46	2.77	3.03	3.37	3.83
45	1.48	1.61	1.83	2.08	2.25	2.46	2.68	3.00	3.30	3.69	4.30
46	1.58	1.73	1.98	2.23	2.43	2.65	2.90	3.27	3.58	4.00	4.87
47	1.70	1.85	2.10	2.40	2.62	2.87	3.16	3.54	3.87	4.34	5.03
48	1.82	1.96	2.27	2.58	2.84	3.12	3.42	3.83	4.20	4.68	5.37
49	1.96	2.13	2.44	2.80	3.09	3.38	3.70	4.11	4.48	4.99	5.72
50	2.13	2.32	2.67	3.09	3.38	3.70	4.02	4.38	4.78	5.32	6.15
51	2.28	2.51	2.91	3.34	3.66	3.97	4.28	4.62	5.03	5.72	6.67
52	2.48	2.73	3.14	3.61	3.92	4.23	4.51	4.86	5.41	6.20	7.35
53	2.69	2.95	3.40	3.88	4.17	4.46	4.75	5.17	5.87	6.84	8.22
54	2.91	3.18	3.84	4.12	4.40	4.69	5.04	5.54	6.39	7.64	9.27

Table 6

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
FEMALE NONSMOKER
SELECT AND ULTIMATE MORTALITY

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
55	3.18	3.46	3.82	4.40	4.89	5.04	5.47	6.03	7.15	8.53	10.41
56	3.41	3.67	4.13	4.63	4.96	5.40	5.85	6.66	7.87	9.58	11.64
57	3.62	3.47	4.36	4.92	5.34	5.88	6.58	7.42	8.95	10.71	12.86
58	3.81	4.06	4.61	5.27	5.81	6.49	7.42	8.33	10.01	11.83	14.06
59	4.00	4.31	4.94	5.73	6.41	7.23	8.33	9.31	11.06	12.96	15.37
60	4.31	4.87	5.44	6.41	7.23	8.12	9.31	10.29	12.11	14.14	16.88
61	4.60	5.07	6.00	7.14	8.02	8.96	10.29	11.28	13.22	15.53	18.71
62	5.00	5.59	6.67	7.91	8.85	9.77	11.28	12.30	14.52	17.21	21.01
63	5.51	6.21	7.38	8.73	9.66	10.56	12.14	13.50	16.09	19.33	23.86
64	6.12	6.87	8.15	9.62	10.42	11.37	13.17	14.97	18.07	21.95	27.24
65	6.87	7.68	9.00	10.42	11.37	12.49	14.41	16.81	20.28	25.06	31.07
66	7.67	8.36	9.72	11.22	12.32	13.66	15.97	19.09	23.15	28.58	35.28
67	8.23	9.01	10.45	12.15	13.47	15.13	17.80	21.79	26.41	32.46	39.78
68	8.87	9.66	11.31	13.28	14.82	17.16	20.43	24.86	29.99	36.81	44.58
69	9.53	10.47	12.35	14.71	16.70	19.61	23.30	28.22	33.82	41.01	49.60
70	10.47	11.60	13.87	16.70	19.07	22.37	26.46	31.43	37.45	45.32	55.69
71	11.41	12.62	15.51	18.60	21.44	25.40	29.84	35.22	41.83	50.68	62.45
72	12.61	14.32	17.43	21.13	23.99	28.65	33.44	39.34	46.78	56.83	70.30
73	14.32	16.34	19.88	23.99	27.06	32.10	37.35	44.00	52.46	63.97	79.37
74	16.34	18.94	22.59	27.09	30.31	35.86	41.77	49.34	59.06	72.23	88.41
75	18.84	21.17	25.47	30.31	33.86	40.10	46.84	55.54	66.87	81.36	100.38
76	21.17	23.87	28.53	33.86	37.87	44.96	52.73	62.70	75.10	91.35	112.06
77	23.87	26.75	31.87	37.87	42.47	50.62	59.52	70.63	84.32	101.97	124.46
78	26.75	29.85	35.64	42.47	47.60	57.15	67.06	79.30	94.12	113.26	137.43
79	29.88	33.41	39.97	47.60	53.97	64.36	75.29	88.52	104.55	125.06	151.12
80	33.41	37.47	44.99	53.97	60.60	72.27	84.04	98.32	115.44	137.52	165.44
81	37.47	42.18	50.80	60.80	68.26	80.66	93.35	108.57	126.94	150.55	180.62
82	42.16	47.62	57.22	68.26	76.19	89.61	103.07	118.36	138.97	164.36	196.99
83	47.62	53.65	64.24	76.19	84.63	98.95	113.34	130.70	151.72	179.28	215.20
84	53.65	60.23	71.71	84.63	93.45	108.81	124.06	142.69	165.47	195.93	236.52
85	60.23	67.23	78.95	93.45	102.76	119.12	135.47	155.62	180.77	215.23	259.38
86	67.23	74.68	87.96	102.76	112.50	130.05	147.74	170.01	198.68	238.89	301.01
87	74.68	82.46	96.72	112.50	122.82	141.63	161.40	186.95	221.24	273.92	359.66
88	82.46	90.67	106.68	122.82	133.95	154.84	177.39	208.07	252.86	327.29	462.34
89	90.67	99.26	116.60	133.95	146.34	170.29	197.54	237.80	302.11	420.73	647.43

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
FEMALE SMOKER
SELECT AND ULTIMATE MORTALITY

Table 7

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
15	.42	.46	.50	.55	.58	.59	.60	.62	.63	.65	.68
16	.46	.50	.55	.58	.59	.60	.62	.63	.65	.68	.69
17	.50	.55	.56	.59	.60	.62	.63	.65	.68	.69	.72
18	.54	.57	.58	.60	.62	.63	.65	.68	.69	.72	.74
19	.57	.58	.59	.62	.63	.65	.68	.69	.72	.74	.78
20	.58	.59	.61	.63	.65	.68	.69	.72	.74	.78	.83
21	.59	.60	.61	.65	.66	.69	.72	.74	.78	.83	.87
22	.60	.60	.62	.66	.69	.72	.74	.78	.83	.87	.92
23	.60	.62	.63	.69	.72	.74	.78	.83	.87	.92	.97
24	.62	.63	.66	.72	.74	.78	.83	.87	.92	.97	1.06
25	.63	.66	.69	.74	.78	.83	.87	.92	.97	1.06	1.11
26	.66	.69	.71	.78	.83	.87	.92	.97	1.06	1.11	1.23
27	.69	.71	.75	.83	.87	.92	.97	1.06	1.11	1.23	1.30
28	.70	.74	.80	.86	.91	.97	1.06	1.11	1.23	1.30	1.57
29	.73	.78	.84	.90	.95	1.06	1.11	1.23	1.30	1.57	1.78
30	.78	.82	.88	.95	1.03	1.11	1.23	1.30	1.57	1.78	2.02
31	.81	.86	.93	1.02	1.06	1.23	1.30	1.57	1.78	2.02	2.31
32	.85	.88	1.01	1.07	1.16	1.30	1.57	1.78	2.02	2.31	2.58
33	.88	.96	1.05	1.18	1.33	1.56	1.78	2.02	2.31	2.58	2.86
34	.95	1.00	1.16	1.33	1.51	1.74	1.96	2.31	2.58	2.86	3.14
35	1.00	1.11	1.31	1.51	1.71	1.96	2.28	2.58	2.86	3.14	3.42
36	1.06	1.24	1.46	1.71	1.94	2.24	2.50	2.86	3.14	3.42	3.72
37	1.22	1.38	1.64	1.94	2.22	2.48	2.75	3.14	3.42	3.72	4.03
38	1.37	1.55	1.84	2.19	2.46	2.72	2.98	3.39	3.68	3.99	4.34
39	1.53	1.74	2.06	2.43	2.69	2.95	3.21	3.65	3.96	4.25	4.66
40	1.74	1.96	2.32	2.69	2.95	3.21	3.50	3.91	4.21	4.54	5.06
41	1.96	2.18	2.55	2.92	3.18	3.46	3.75	4.17	4.49	4.86	5.46
42	2.17	2.40	2.78	3.15	3.42	3.71	3.99	4.45	4.83	5.21	5.93
43	2.37	2.61	2.98	3.39	3.67	3.96	4.26	4.78	5.16	5.63	6.46
44	2.57	2.80	3.20	3.63	3.91	4.21	4.57	5.10	5.51	6.07	7.00
45	2.80	3.06	3.47	3.91	4.21	4.57	4.93	5.46	5.94	6.58	7.57
46	3.01	3.28	3.69	4.17	4.52	4.88	5.28	5.88	6.37	7.04	8.13
47	3.22	3.47	3.93	4.47	4.82	5.22	5.58	6.30	6.81	7.58	8.66
48	3.43	3.70	4.22	4.77	5.16	5.62	6.06	6.74	7.32	8.04	9.13
49	3.66	3.98	4.48	5.10	5.56	6.02	6.51	7.15	7.70	8.48	9.61
50	3.98	4.27	4.86	5.56	6.02	6.51	6.99	7.53	8.13	8.94	10.15
51	4.22	4.57	5.23	5.95	6.43	6.91	7.36	7.85	8.46	9.44	10.87
52	4.51	4.91	5.60	6.36	6.83	7.27	7.67	8.17	8.93	10.11	11.76
53	4.85	5.26	5.99	6.75	7.16	7.58	7.96	8.53	9.57	10.94	12.98
54	5.18	5.60	6.34	7.06	7.48	7.88	8.32	9.02	10.23	12.06	14.37

Table 7

1980 CSO
BASIC
AGE NEAREST BIRTHDAY
FEMALE SMOKER
SELECT AND ULTIMATE MORTALITY

ISS AGE	POL YEAR 1	2	3	4	5	6	7	8	9	10	ULT
55	5.90	6.02	6.75	7.49	7.88	8.32	8.81	9.64	11.30	13.22	15.93
56	5.93	6.31	7.03	7.75	8.22	8.80	9.53	10.52	12.36	14.66	17.48
57	6.23	6.57	7.30	8.12	8.70	9.41	10.39	11.50	13.70	16.06	19.03
58	6.48	6.82	7.61	8.59	9.29	10.28	11.50	12.74	15.02	17.51	20.42
59	6.72	7.11	8.04	9.17	10.13	11.21	12.74	13.87	16.37	18.79	21.98
60	7.11	7.61	8.70	10.13	11.21	12.43	13.87	15.22	17.58	20.22	23.63
61	7.50	8.11	9.48	11.08	12.27	13.44	15.22	16.34	18.90	21.74	25.82
62	8.00	8.63	10.35	12.11	13.27	14.48	16.34	17.58	20.32	23.75	28.57
63	8.70	9.63	11.31	13.10	14.27	15.32	17.38	18.90	22.21	26.28	31.87
64	9.48	10.51	12.22	14.06	15.11	16.27	18.43	20.66	24.57	29.41	35.98
65	10.51	11.52	13.32	15.11	16.27	17.49	19.88	22.86	27.17	33.06	40.39
66	11.38	12.37	14.09	16.06	17.28	18.65	21.71	25.58	30.97	37.16	45.18
67	12.18	13.07	14.95	17.01	18.58	20.57	23.98	28.77	34.32	41.56	50.14
68	12.86	13.65	15.53	18.33	20.28	23.02	26.87	32.31	38.38	46.13	55.28
69	13.62	14.65	17.04	20.00	22.38	25.88	30.29	36.13	42.82	50.66	60.78
70	14.66	16.01	18.88	22.38	25.17	29.08	33.87	39.61	46.44	55.28	66.83
71	15.75	17.43	20.78	24.81	27.87	32.52	37.61	43.67	51.04	60.82	73.69
72	17.14	19.18	23.01	27.47	30.71	36.10	41.48	48.00	56.14	67.06	81.55
73	19.18	21.58	25.85	30.71	34.10	39.80	45.57	52.80	61.90	74.21	90.48
74	21.58	24.23	28.90	34.10	37.58	43.75	50.12	58.22	68.50	82.34	101.03
75	24.23	27.10	32.09	37.59	41.32	48.12	55.27	64.42	76.00	91.94	111.42
76	27.10	30.08	35.38	41.32	45.44	53.08	61.16	71.48	84.87	101.39	123.28
77	30.08	33.17	38.89	45.44	50.11	58.72	67.66	79.81	93.59	112.17	134.42
78	33.17	36.46	42.77	50.11	55.45	65.15	75.77	88.02	103.54	122.32	147.05
79	36.46	40.10	47.18	55.45	61.53	72.74	83.57	97.38	112.91	133.82	158.68
80	40.10	44.21	52.19	61.53	68.70	80.22	92.45	108.19	123.52	144.40	172.08
81	44.21	48.93	57.81	68.70	75.77	88.75	100.82	116.17	133.28	156.57	186.04
82	48.93	54.28	64.66	75.77	83.82	96.78	110.29	125.36	144.53	169.30	200.83
83	54.28	60.62	71.31	83.82	91.41	105.88	119.01	135.93	156.27	182.85	217.35
84	60.62	66.85	78.89	91.41	99.99	114.25	129.05	146.97	168.78	197.79	236.52
85	66.85	73.96	86.03	99.99	107.90	123.68	139.53	158.73	182.57	215.23	263.38
86	73.96	80.65	94.11	107.90	117.00	133.95	150.70	171.71	196.68	239.68	301.01
87	80.65	88.23	101.56	117.00	126.51	144.67	163.01	186.85	221.24	273.92	358.66
88	88.23	95.21	110.12	126.51	136.63	156.49	177.39	208.07	252.65	327.29	462.34
89	95.21	103.24	119.07	136.63	147.80	170.26	197.54	237.80	302.11	420.73	647.43

ATTACHMENT TWO

AMERICAN ACADEMY OF ACTUARIES
1720 I STREET, N.W.
7TH FLOOR
WASHINGTON, D.C. 20006
(202) 223-8196
October 30, 1986

Honorable Thomas P. Fox, Chairman
NAIC Life Cost Disclosure Task Force
Commissioner of Insurance
P.O. Box 7873
123 W. Washington Avenue
Madison, WI 53707

RE: NAIC Model Life Insurance Cost Disclosure Regulation

Dear Commissioner Fox:

Products that contain non-guarantee charges, benefits or premiums have become a very significant portion of today's life insurance market. Universal life insurance is only one example of such a product.

Various insurance departments and members of the American Academy of Actuaries have expressed concerns about sales disclosures used with non-guarantee element products. As a result, the Academy appointed a task force on non-guarantee elements. This task force recommends that the NAIC Life Insurance Disclosure Model Regulation be amended to incorporate the enclosed changes.

At the time the latest revision was made in the Life Insurance Disclosure Model Regulation, generally accepted actuarial standards had not been established for dividends paid by stock life insurance companies. As a result the revisions apply only to mutual life insurance companies. Generally accepted actuarial practices have now been developed for dividends paid by stock life insurance companies. As a result we recommend that any references to mutual life insurance companies in a model regulation be eliminated.

If the task force can be of any assistance to you, please let me know.

Yours truly,

William T. Tozer, Chairman
Task Force on Non-Guarantee Elements

RECOMMENDED CHANGES TO THE NAIC MODEL LIFE INSURANCE DISCLOSURE REGULATION

It is recommeded that any reference in this Model Regulation limiting its application to mutual life insurance companies be eliminated.

The following be added between paragraph D and E of Section 4. "Current Rate Policy. The Current Rate Policy describes when and under what conditions the company intends to change any Current Rate Schedule."

Add the following to the end of Section 4, paragraph M, sub-paragraph 9: ". . . and the Current Rate Policy for changing any Current Rate Schedule."

Add the following to Section 5, paragraph C: "3. If the life insurance company materially changes its Current Rate Policy on existing contracts, it shall, no later than the first contract anniversary following the change, advise each affected contract owner residing in the state of such change."

UNIVERSAL AND OTHER NEW PLANS (A) TASK FORCE

Reference:

1986 Proc. I p. 655
1986 Proc. II p. 648

George F. Grode, Chairman—Pa.
John G. Richards, Vice Chairman—S.C.

CONTENTS

December 8, 1986 Report 647
Report of Advisory Committee on Indexed Products Other Than Universal Life (Attachment One) 648

AGENDA

1. Report of Life & Health Actuarial Task Force
2. Report of Advisory Committee on Model Universal Life Regulation
3. Report of Advisory Committee on Indexed Products Other than Universal Life
4. Consider Continuation of Task Force
5. Any Other Matters Brought Before the Task Force

The Universal and Other New Plans (A) Task Force met in Salons XI & XII of the Marriott's Orlando World Center in Orlando, Fla., at 3 p.m. on Dec. 8, 1986. A quorum was present and J. Alan Lauer (Pa.) chaired the meeting. The following task force members or their representatives were present: Roxani Gillespie (Calif.); Michael J. Dugan (Neb.); David A. Gates (Nev.); James P. Corcoran (N.Y.); James L. Nelson (Texas); and James M. Thomson (Va.).

1. Report of Life & Health Actuarial (EX5) Task Force

John Montgomery (Calif.) presented the report of the Life and Health Actuarial Task Force. He outlined the projects which have been considered by the Task Force and made four recommendations:

a) Receive as an exposure draft for possible adoption in June 1987 the proposals on universal life valuation, namely, the proposed amendment to Actuarial Guideline XIV and the proposed amendment to the Universal Life Insurance Model Regulation, (See Attachment Two-A to the Life and Health Acturarial Task Force Report.)

b) Receive as an exposure draft for possible adoption in June 1987 a proposal to modify the Universal Life Insurance Model Regulation concerning non-forfeiture provisions, (See Attachment Two-B to the Life and Health Actuarial Task Force Report.)

c) Delete the Modified Guaranteed Life Insurance Plans project from the Actuarial Task Force agenda, and

d) Reprioritize the project on single premium life to the number one priority category.

Upon motion duly made and seconded, the Universal Task Force adopted the Life and Health Actuarial Task Force Report, which includes the four recommendations (a-d) listed above.

The American Council of Life Insurance agreed to serve again as the vehicle for exposing the proposals on amending the Universal Life valuation and non-forfeiture provisions and will report back to the Actuarial Task Force.

2. Report of Advisory Committee on Model Universal Life Regulation

The Task Force heard the report of the Advisory Committee on Model Universal Life Regulation from Jim Jackson (Transamerica Occidental), chair. He indicated that although the advisory committee has not met for some time, it certainly will meet if the need arises.

3. Report of Advisory Committee on Indexed Products Other than Universal Life

Howard Kayton (Security First Life Insurance) presented the report of the Advisory Committee on Indexed Products Other Than Universal Life (Attachment One). He outlined the provisions of a draft regulation for interest-indexed annuity products.

Upon motion duly made and seconded, the Task Force received as a disclosure draft for possible adoption in June 1987 the proposed regulation on interest-indexed annuity products.

Anthony T. Spano (ACLI) agreed that his organization will serve as the vehicle for exposing this draft.

4. Consider Continuation of Task Force

Adopted a motion to recommend continuation of the task force to the Life Insurance (A) Committee.

Having no further business, the Universal and Other New Plans (A) Task Force adjourned at 3:45 p.m.

George F. Grode, Chairman, Pa.; John G. Richards, Vice Chairman, S.C.; Afa Roberts, American Samoa; Roxani Gillespie, Calif.; Gil McCarty, Ky.; Peter Hiam, Mass.; Michael J. Dugan, Neb.; David A. Gates, Nev.; James P. Corcoran, N.Y.; James L. Nelson, Texas; James M. Thomson, Va.

ATTACHMENT ONE

Report of Advisory Committee on Indexed Products
Other Than Universal Life

Pruco Life Insurance Company

November 25, 1987

Mr. George F. Grode
Commissioner of Insurance
Pennsylvania Insurance Department
Strawberry Square
Harrisburg, PA 17120

Dear Mr. Grode:

Gilbert Fitzhugh, Chairman of the Advisory Committee on Indexed Products Other Than Universal Life Products, has asked me to send the attached draft regulation for interest-indexed annuity products to you for consideration the NAIC's Universal and Other New Plans (A) Task Force. A copy of the draft is also being sent to John Montgomery, chairman of the Life and Health Actuarial (EX5) Task Force.

The draft regulation is similar to the regulation already produced for interest-indexed universal life insurance. Substantive differences are as follows:

1. Addition of a provision for a substitute if the index is discontinued.

2. Addition of a specific provision that investments be appropriate considering the index being used.

3. Deletion of the requirement that the insurer describe the method of determining interest credits after the index expires. (Products that are not interest-indexed do not have such a requirement now.)

4. Addition of a requirement that additional assets be allocated if the insurer is unable to otherwise certify the sufficiency of the assets.

5. Addition of a section on valuation requirements.

Mr. Fitzhugh will be unable to attend the NAIC meeting in Orlando. Howard Kayton, a member of the committee, will be at the meeting, however.

If there are questions prior to the meeting, you can contact me (since Mr. Fitzhugh is out of the office) or Mr. Kayton.

Sincerely,

R. Scott M----------

cc: Mr. John Montgomery
Mr. J. Alan Lauer
Advisory Committee
Mr. Gilbert Fitzhugh
Mr. Gregory Carney
Mr. Larry Fredrickson
Mr. Robert Hersh
Mr. Howard Kayton
Mr. Paul Kolkman
Mr. Stanley Tulin
Mr. Michael Tuohy

INTEREST-INDEXED ANNUITY POLICIES

A. Definition

"Interest-indexed annuity policy" means any annuity policy where the interest credits are linked to an external reference.

(Note: This regulation currently addresses only the indexing of interest credits. Should products be developed which involve the indexing of other factors, such as expenses, this regulation may require modification.)

B. Initial Filing Requirements

The following information shall be submitted in connection with any filing or interest-indexed annuity policies. All such information received shall be treated confidentially to the extent permitted by law.

1. A description of how the interest credits are determined, including:

   a. a description of the index.

   b. a provision for a substitute if the index is discontinued; such substitute to be approved by the department.

   c. a formula showing the derivation of the crediting rate based on the value of the index.

   d. the frequency and timing of determining the crediting rate.

   e. the allocation of interest credits, if more than one crediting rate applies to different portions of the policy value.

2. A description of the insurer's investment policy, including:

   a. the amount and type of assets currently held for interest-indexed annuity policies.

   b. the amount (distribution) and type of assets expected to be acquired in the future for such policies.

   c. a determination that the investments made will be appropriate considering the index being used.

   d. how the insurer plans to address the risk that a sufficient quantity of appropriate investments may not be available.

   e. how the insurer plans to address any mismatch risk inherent in the policy.

3. If policies are to be linked to an index for some specified period less than the time to the maturity date of the policy, the date of expiration of such period and any minimum quaranteed rates that apply thereafter.

4. A description of any interest guarantee in addition to or in lieu of the index. A description of how the insurer plans to address the risk that the indexed interest rate may fall below such minimum guarantee.

C. Additional Filing Requirements

To the extent permitted by law, any material submitted as a result of the following requirements will be treated confidentially.

1. Prior to implementation, a domestic insurer shall submit a description of any material change in investment policy or method of determining the interest credits. A change is considered to be material if it would affect the form or definition of the index or if it would significantly change the amount or type of assets held for interest-indexed annuity policies.

2. Annually, the insurer shall submit a description of the amount and type of assets currently held by such insurer to support its interest-indexed annuity policies.

3. Annually, the insurer shall submit a Statement of Actuarial Opinion by the insurer's actuary certifying that the assets under interest-indexed annuity products are sufficient to cover the contractual obligations under the policies. If the insurer is unable to certify the sufficiency of such assets, additional assets shall be allocated to these products so that such a certification can be submitted.

(Note: The American Academy of Actuaries is developing guidelines which will delineate the responsibilities of the actuary in signing a Statement of Actuarial Opinion. Attached is a sample Statement of Actuarial Opinion which the Advisory Committee believes will satisfy its guidelines. If necessary, the final regulations should be revised to conform with the Academy's guidelines.)

D. Valuation Requirements

1. In filing the above items, the insurer demonstrates its ability to meet its future contractual obligations.

2. In developing life insurance reserves for interest-indexed annuity policies, the insurer must be in compliance with the minimum requirements of the Standard Valuation Law of this state. Additional reserves will be required if the insurer does not certify its assets as required in section C.3. of this regulation.

3. In the calculation of reserves for interest-indexed annuity policies, future guarantees will be determined by assuming that future interest crediting rates will be equal to the statutory valuation interest rate for such policies as defined in the Standard Valuation Law.

* * * *

Statement of Actuarial Opinion
for Interest-Indexed Annuity Policies.

I, _____, am _____
(name) (position or relationship to Insurer)
for the XYZ Life Insurance Company (The Insurer) in the state of_____.
(State of Domicile of Insurer)

I am a member of the American Academy of Actuaries (or if not, state other qualifications to sign annual statement actuarial opinions).

I have examined the interest-indexed annuity policies of the Insurer in force as of December 31, 19XX, encompassing _____ (number of) policies and $ _____ of reserves.

I have considered the provisions of the policies. I have considered the characteristics of the identified assets and the investment policy adopted by the Insurer as they affect future insurance and investment cash flows under such policies and related assets. My examination included such tests and calculations as I considered necessary to form an opinion concerning the insurance and investment cash flows arising from the policies and related assets.

I relied on the investment policy of the Insurer and on projected investment cash flows as provided by _____, Chief Investment Officer of the Insurer.*

The tests were conducted under various assumptions as to future interest rates, and particular attention was given to those provisions and characteristics that might cause future insurance and investment cash flows to vary with changes in the level of prevailing interest rates.

In my opinion, the anticipated insurance and investment cash flows referred to above make good and sufficient provision for the contractual obligations of the Insurer under these policies.

_____
Signature of Actuary

*If the actuary does not choose to rely on an investment officer for the projected investment cash flows, this statement should be modified to show the extent of the actuary's reliance. If the actuary has not examined the underlying records, but has relied on listings and summaries of policies in force, an appropriate statement of such reliance should be included.