Report

of the

Society of Actuaries

Regulation XXX

Survey Subcommittee

March 2002

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Introduction

The attached report presents the results of a survey whose purpose was to explore the actions companies took on their term products in response to the introduction of the NAIC Valuation of Life Insurance Policies Model Regulation (Regulation XXX) and Actuarial Standard of Practice No. 40. The survey also explored the development of companies' X factors, the associated annual X factor certification process and how Regulation XXX impacted the companies' level term pricing. The survey was conducted by the Regulation XXX Survey Subcommittee of the Society of Actuaries Life Insurance Mortality and Underwriting Survey Committee.

The survey was made available on the SoA web site (www.soa.org) in June of 2001. 53 companies, including four reinsurers, responded to the survey. A list of the companies who participated in the survey can be found at the end of the report in Appendix 1. The survey was comprised of five different sections. However, not all companies responded to each of the sections of the survey or to each of the individual questions within a section.

Percentage results are shown based on the total number of companies who responded to each specific section, unless otherwise noted. Due to rounding and because many questions allowed Respondents to "check all that apply," percentages contained in the survey results may not add to 100%.

The Subcommittee would like to thank all of the companies who took the time to complete the survey. We would also like to thank the staff of the Society of Actuaries, in particular Korrel Crawford and Jack Luff, for their invaluable help in facilitating our meetings to develop the survey and analyze the results and for arranging to have the survey posted on the SoA web site.

The survey responses clearly indicate that Regulation XXX significantly impacted the way companies price and manage their product lines. We hope that you find the results of the survey both interesting and helpful. Your feedback on this survey and the survey process in general in the form of comments and suggestions is appreciated and will be used to drive future improvements. Please send any comments to Jack Luff at the Society of Actuaries.

Regulation XXX Survey Subcommittee of the Society of Actuaries Life Insurance Mortality and Underwriting Survey Committee:

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Executive Summary

In June of 2001, the insurance industry was surveyed on their response to Regulation XXX with respect to term products. 49 insurance companies and four reinsurers responded to the survey. Some of the highlights of the survey results are shown below. Note that the percentages shown in the Executive Summary are based on the number of insurance companies responding to a particular question, not the total of 49 insurance companies participating in the overall survey. The percentages in the Executive Summary also do not include the responses from the four reinsurers.

- 69% of the Respondents reported that they considered reinsurance as a response to Regulation XXX.

- 65% of the Respondents indicated that they changed product designs in response to Regulation XXX. The most common design changes reported were to the length of the guarantee period and to the level of the gross premiums.

- 57% of the Respondents reported that they changed rates on existing products in response to Regulation XXX.

- The most frequently cited reasons given for changing rates in the 20-year level term product with a 20-year guarantee were competition and Regulation XXX. Other reasons included change in agent compensation, change in the level of expenses, change in underwriting, emerging mortality experience, the desire for a new product and reinsurance support.

- 29% of the Respondents indicated that they took no action as a result of Regulation XXX. The reason most often mentioned was that the Respondents believed that they were already compliant.

- More than 50% of Respondents reported that they calculated X factors assuming anticipated mortality with a degree of conservatism. The Respondents indicated using a number of other methods as well.

- About one-quarter of the Respondents reported using risk class as the only category in tabulating X factors. Another quarter reported using four categories (issue age, gender, risk class and duration) in their tabulations. The rest of the responses varied, with up to five categories (the four just mentioned plus policy form) being used.

- About one-third of the Respondents reported using a combination of their own mortality experience and the mortality experience of their reinsurers to develop their X factors. The other Respondents reported using a combination of up to three sources of mortality experience (the two just mentioned plus industry experience) to develop their X factors. Of those using their own mortality experience, 40% reported using only one exposure year of experience. Most of the remaining Respondents reported using 2 - 6 exposure years, but up to 15 exposure years was reported.

- Some Respondents indicated that they changed their X factors from those originally developed for pricing products during calendar year 2000. Some indicated that they changed their X factors for calendar year-end 2000 valuation and others indicated that they changed or planned to change their X factors for pricing products in 2001.

- The Respondents reported the X factors they used for 2000 pricing and 2000 valuation for a male age 45 in the best nonsmoker class for a 20-year term product with a 20-year rate guarantee. For 2000 pricing, these X factors ranged from 24% at duration 1 to 61% at duration 20. For 2000 valuation, the X factors ranged from 24% at duration 1 to 68.2% at duration 20. On average, the X factors were slightly higher for the 2000 valuation than those used for 2000 pricing.

- 32% of the Respondents sought help from their reinsurers for X factor certification.

- There appeared to be a slight movement away from the 10-year level term products with 10-year guarantees and a slight movement toward the 20-year level term products with 20-year guarantees among the Respondents.

Analysis

Note: Due to rounding and because many questions allowed Respondents to "check all that apply," percentages contained in the survey results may not add to 100%.

Items in italics represent direct quotes from the respondents.

Section 1 – Company Actions in Response to the Adoption of Regulation XXX

The Survey asked the companies how they responded to the adoption of Regulation XXX. 49 insurance companies and four reinsurers responded. Table 1 below shows that about two-thirds of the insurance companies responded by changing product design, changing rates and/or seeking reinsurance solutions. The other one-third took little or no direct action or maintained a "wait and see" approach.

Table 1
How Companies Responded to the Adoption of Regulation XXX

Response	Percentage of Respondents
Considered reinsurance	69%
Changed product design	65%
Changed rates on existing products	57%
Took no action	29%
Other actions	6%

The four reinsurers responded to Regulation XXX as follows:

- all four changed rates on existing products; and
- two considered reinsurance (i.e., retrocessionaires).

The Survey asked if companies considered some form of reinsurance in their response to Regulation XXX, either by using a U.S. reinsurer or by going to an offshore entity. 34 (69%) insurance companies considered reinsurance and 11 of the 34 considered an offshore solution.

Not every company considered every reinsurance option, and some considered more than one option. Of the 34 insurance companies that considered reinsurance, 94% considered a U.S. reinsurer.

The Survey asked what level of involvement companies had with reinsurers or offshore entities in pursuing a Regulation XXX solution. Companies responded with various combinations of reinsurer advice, receipt of a reinsurance quote and with the placement of business. Surprisingly, a few companies responded that they placed business without receiving advice or a quote. A couple of other similarly anomalous responses were received. Table 2 below shows the involvement that the 34 insurance companies indicated for each of the various options. For insurance companies going to a U.S. reinsurer for advice, 87% reported that they followed up with placing business. For insurance companies going to other entities for advice, nearly all of them followed up with receiving a quote and placing business.

Table 2
Consideration of Reinsurance in Response to the Adoption of Regulation XXX

Considered Reinsurance	Went Directly to for Advice	Received Quote From	Placed Business With
U.S. Reinsurer	85%	71%	74%
Offshore Insurer	18%	18%	21%
Offshore Subsidiary	9%	9%	9%
Offshore Affiliate	6%	3%	6%

Two reinsurers considered a reinsurance solution:

- two went directly to an offshore affiliate for advice; and
- one placed business with an offshore affiliate.

A more detailed breakdown of the companies that changed product design and/or rates on existing products is shown in Table 3 below. Table 3 shows that 82% of the insurance companies changed the design of their products, their rates, or both products and rates, with 43% of the companies reporting changing both the design of their products and the rates. One company did not indicate design or rate changes in this question; however, they provided product design feature changes in a later question and, therefore, are included in Table 3 below.

Table 3
Product Design and Rate Changes in Response to the Adoption of Regulation XXX

Changed Design and/or Rates	Percentage of Respondents
Design and rates	43%
Design only	22%
Rates only	10%
Rates but did not indicate whether design changed	4%
Design but did not indicate whether rates changed	3%
Neither design nor rates	18%

The Survey asked what product design features companies implemented in response to Regulation XXX. 40 insurance companies responded. The two most common changes reported were to the length of the guarantee period (75%) and to the level of the gross premiums (75%). These and other changes are shown in Table 4 below. Of the product design feature changes, 57% of the Respondents reported one or two design changes, 33% reported three or four design changes and 11% reported five or more design changes. One company reported as many as seven design changes in response to Regulation XXX.

Table 4
Product Design Changes in Response to the Adoption of Regulation XXX

Product Design Features	Percentage of Respondents
Changed the length of the guarantee period	75%
Changed the gross premiums	75%
Lowered the maximum issue age	25%
Changed the ART scales	25%
Changed the number of underwriting classes	20%
Write-ins (described below)	15%
10-year* current premium with higher next 10-year* guaranteed premium but current premium continues after 10 years* unless unlikely events occur. *or applicable period	10%
Decided not to illustrate current premiums	5%
Changed the benefit pattern	3%
Refund option provides specified refund (during limited request window) if premium ever increases	3%

Write-in comments were received on this question. They were:

- *Discontinued one product;*
- *Offered one plan with a decreasing death benefit design, which allowed premiums to remain level and guaranteed at very low levels;*
- *Rider to extend guarantee period;* and
- *Withdrew 25 and 30-year term products from market.*

All three reinsurers that responded to the question on product feature changes in response to Regulation XXX had write-in comments:

- *As reinsurer, we use offshore retrocession for higher reserves;* and
- *Changed allowances* (2 reinsurers).

In response to Regulation XXX, eight insurance companies reported a change in the number of underwriting classes. Table 5 shows that of the eight Respondents, six reported an increase in the number of classes, one reported a decrease in the number of classes and one did not specify the number of classes. While it might be expected that the number of rate classes would have decreased due to the justification needed in the development of X factors, most of the eight companies indicated an increase in the number of rate classes, probably due to competitive reasons. There appeared to be a movement toward five rate classes.

Table 5
Underwriting Class Changes in Response to the Adoption of Regulation XXX

Number of UW Classes		Number of Respondents
From	To	
2	5	1
3	4	1
3	5	2
4	5	2
7	5	1
Did Not Specify		1

13 insurance companies took no action as a response to Regulation XXX. Four indicated two reasons and nine indicated one reason for taking no action. The largest response (4 Respondents) took no action because they did not have long-term premium guarantees. Table 6 shows how the 13 responded:

Table 6
Reasons Companies Took No Action in Response to the Adoption of Regulation XXX

Reasons Companies Took No Action	Number of Respondents
Already had shorter term level premium guarantees	4
Had a large amount of surplus	3
Wanted to gain competitive advantage	2
Waited to see competitor's actions	1
Anticipated low sales	1
Write-ins (described below)	6

The write-in reasons for taking no action in response to Regulation XXX were:

- *Already Regulation XXX compliant with current product. However, did develop new product to be more competitive;*
- *Company does not currently offer level term;*
- *Current product did not generate large deficiencies;*
- *Not selling term life and we raised universal life minimum premiums to avoid Regulation XXX issues;*
- *NYS* (sic) *lower reserves*; and
- *Products were already subject to NY147.*

Insurance companies took the opportunity to write additional comments about their response to Regulation XXX. Here are the remarks:

- *Took "wait and see" approach -- new portfolio went live in July 2001;*
- *We dropped some forms, which were not heavily sold but would have had significant reserve increases;*
- *Withdrew 25 and 30-year term products from market;* and
- *For two plans, changed reinsurance from YRT to coinsurance.*

Reinsurers also made comments regarding their reaction to Regulation XXX:

- *Price too high;*
- *Uncomfortable with offshore approach;* and
- *Waited to see competitor's actions.*

The Survey asked companies what type of select factors they used for basic and deficiency reserves for year-end 2000 valuation. "10-year select factors" refers to the 10-year select mortality factors available for use with the 80CSO. "Regulation XXX select factors" refers to the 19-year select mortality factors contained in Regulation XXX. 46 insurance companies responded to this question. 59% reported that they used Regulation XXX select factors for both their basic and deficiency reserves and another 24% used them for deficiency reserves only. In total, 83% of the Respondents used Regulation XXX select factors. Table 7 below shows the results.

Table 7
Type of Select Factor used for Reserves

Select Factor Type	Basic & Deficiency	Basic Only	Deficiency Only
No select factors	9%	22%	0%
10-year select factors	20%	7%	4%
Regulation XXX select factors	59%	0%	24%

Many Respondents indicated that they used more than one type of select factor for basic and deficiency reserves. While about three-quarters of the Respondents used only one type of select factor for both basic and deficiency reserves, it appears that some companies used different select factors independently within a plan and/or across plans.

All four reinsurers responded to the question on what type of select factors were used for basic and deficiency reserves. The following is a summary of what was reported:

- three use "Regulation XXX select factors" for basic and deficiency;
- one also uses "10-year select factors" for basic reserves; and
- one uses "10-year select factors" for basic, but did not indicate what they use for deficiency.

Section 2 – X Factors

The Survey explored the development of X factors for use in the computation of reserves under Regulation XXX. 44 insurance companies and four reinsurers responded to this section of the Survey.

The Survey asked if companies had used X factors which were less than 100%. 44 insurance companies responded to this question. 84% of the Respondents indicated that they used X factors less than 100%. The remaining 16% indicated that they did not use X factors less than 100%.

Of the four reinsurers, three indicated that their clients had used X factors less than 100% and one indicated that either the question did not apply or they did not use X factors less than 100%.

The seven insurance companies who did not use X factors less than 100% were instructed to skip to the next section. The remaining 37 insurance companies and the three reinsurers who used X factors less than 100% were next queried about the development of their X factors.

The Survey asked companies to indicate who was involved as a resource in the development of the X factors less than 100%. Companies indicated more than one resource in most cases. Where more than one resource was indicated, it is possible that the multiple resources are, in fact, the same person; however, the Survey did not specifically ask this question.

The percentages shown in Table 8 below reflect the percentage of the total Respondents (37). The Pricing Actuary (76%) was identified most frequently as the resource being involved in the analysis. Other resources cited frequently were the Valuation Actuary (59%), the Chief Actuary (46%), Reinsurer (43%) and the Illustration Actuary (41%). Table 8 shows the details of the resources involved in the analysis to develop the X factors for their companies.

Table 8
Resources Involved in X Factor Development

Resource	Percentage of Respondents
Pricing Actuary	76%
Valuation Actuary	59%
Chief Actuary	46%
Reinsurer	43%
Illustration Actuary	41%
Consultant	11%
Statistician	5%
Auditor	3%
Underwriter	0%
Other	11%

Other resources involved in the development of the X factors were:

- *Staff Actuary;*
- *Supporting Actuary;*
- *Supporting Actuarial Student;* and
- *Actuarial Analyst*.

The companies were also asked to indicate the resources who where involved in the decision-making process to set the final X factors. The Valuation Actuary (70%) was the most frequently cited resource involved in the decision-making process. Other decision-makers frequently indicated were the Chief Actuary (46%), the Pricing Actuary (43%) and the Illustration Actuary (30%). Table 9 below shows the participation in the decision-making process in detail.

Table 9
Decision-Maker(s) in the Development of X Factors

Resource	Percentage of Respondents
Valuation Actuary	70%
Chief Actuary	46%
Pricing Actuary	43%
Illustration Actuary	30%
Reinsurer	8%
Consultant	3%
Auditor	0%
Statistician	0%
Underwriter	0%
Other	0%

As noted previously, most of the Respondents indicated that more than one person was involved in the analysis & decision-making process. Table 10 shows how frequently each of the major resources was involved in the analysis only, in the decision-making only, in both analysis & decision-making and their total involvement in the process. There were also a number of companies where the resource was not involved at all. The Valuation Actuary (82%) was identified as the resource with the most total involvement. Other resources identified with high total involvement were the Pricing Actuary (81%), the Chief Actuary (54%) and the Illustration Actuary (52%). The following table shows these results.

Table 10
Depth of Involvement

Involved In	Decision-Maker Only	Analysis Only	Analysis & Decision-Making	Total Involvement
Valuation Actuary	22%	11%	49%	82%
Pricing Actuary	5%	38%	38%	81%
Chief Actuary	8%	8%	38%	54%
Illustration Actuary	11%	22%	19%	52%
Reinsurer	0%	35%	8%	43%
Consultant	0%	8%	3%	11%
Statistician	0%	5%	0%	5%
Auditor	0%	3%	0%	3%
Underwriter	0%	0%	0%	0%
Other	0%	11%	0%	11%

Two of the three responding reinsurers indicated that the Valuation Actuary was involved in the analysis, and all three reinsurers listed the Valuation Actuary as the only decision-maker.

The Survey explored methodologies that were used to develop the company's X factors for pricing and valuation purposes. Survey participants were also asked about methodologies planned to be used in the future.

The method most used for pricing (38%) and valuation (42%) was that based on calculations using anticipated mortality with conservatism. Results were mixed, varying by the purpose. The details of the responses are shown in Table 11 below. The percentages are computed based on the total number of Respondents for each purpose, but won't add up to 100% because some companies selected more than one method for each purpose. Table 11 also shows the total number of responses for each of the purposes.

Table 11
Methodologies Used in the Development of X Factors

Methodology	Pricing Percentage of Respondents	Valuation Percentage of Respondents	Planned Future Method Percentage of Respondents
Solved to avoid deficiency reserves	12%	3%	4%
Calculated using anticipated mortality with conservatism	53%	61%	52%
Calculated using anticipated mortality without conservatism	26%	22%	22%
Consultant calculated	3%	3%	4%
Reinsurer calculated	26%	14%	13%
Used Monte Carlo simulation	21%	36%	48%
Used Panjer method	3%	6%	9%
Number of Respondents	34	36	23

The 23 companies providing a response to the Planned Future Method portion of the question were analyzed as a separate group in order to determine the direction of a possible change of methods in the future. Table 12 below shows the details of anticipated changes in future methods relative to the methods indicated in the Pricing and Valuation portions.

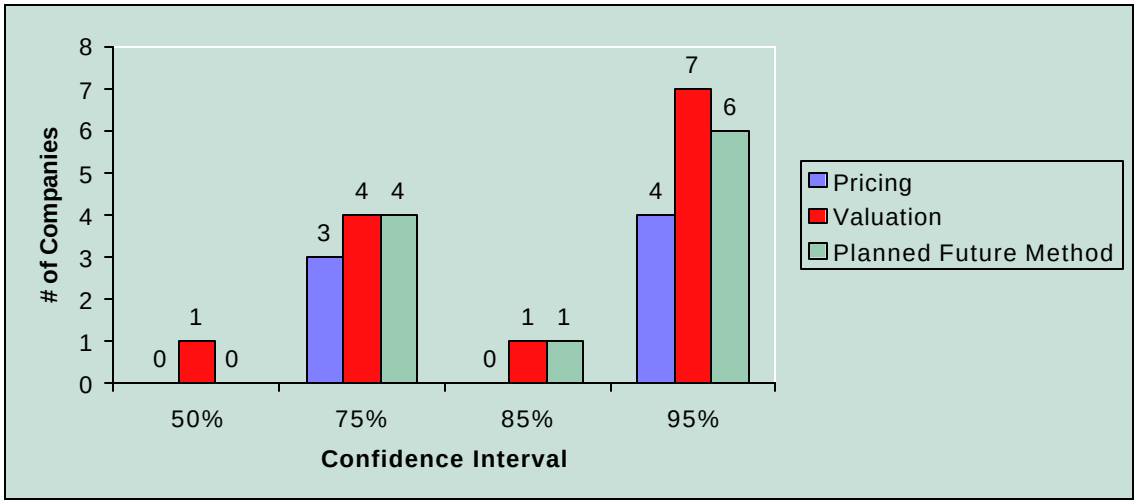
Of this group, 48% indicated that they "calculated using anticipated mortality with conservatism" for pricing and valuation and 52% indicated that they would use this method as a planned future method. Also, 30% indicated that they used the Monte Carlo simulation method for pricing and 52% indicated that they used it for valuation, while 48% of the same group indicated that they would use this method as a planned future method.

Table 12
Planned Changes of Method for the Future

Methodology	Pricing Percentage of Respondents	Valuation Percentage of Respondents	Planned Future Method Percentage of Respondents
Solved to avoid deficiency reserves	9%	4%	4%
Calculated using anticipated mortality with conservatism	48%	48%	52%
Calculated using anticipated mortality without conservatism	22%	26%	22%
Consultant calculated	4%	4%	4%
Reinsurer calculated	13%	13%	13%
Used Monte Carlo simulation	30%	52%	48%
Used Panjer method	4%	9%	9%
Number of Respondents	23	23	23

The Survey asked the companies that used Monte Carlo simulation or the Panjer method to provide the confidence interval used in implementing these methodologies. Most of the companies used either a 95% or a 75% confidence interval. Usage by confidence interval under the Monte Carlo approach is shown in Chart 1 below. Due to the low response to this question, the number of Respondents rather than the percentages are shown in Chart 1 below.

Chart 1
Monte Carlo Confidence Interval Frequency



No companies indicated that the Panjer method had been used for pricing; however, one company did indicate that they had used it to validate their other approaches. Two companies indicated that they used the Panjer method for valuation and were planning to use it in the future. Both indicated that 95% confidence intervals had been used in their Panjer computations.

The Survey asked companies to indicate the categories by which the company's X factors varied. The tabulation categories were issue age, gender, risk class, duration and policy form. 37 companies responded to this question. 16% of the Respondents used all five categories in developing their X factors.

32% of the Respondents used four categories. Of those, 75% used issue age, gender, risk class and duration, while another 17% of those used issue age, gender, risk class and policy form.

16% of the Respondents used three categories to set their X factors. Of those, 50% used issue age, gender and risk class, and 33% used gender, risk class and policy form.

8% of the Respondents used the two categories of gender and risk class and, finally, 27% of the companies used only one category, risk class, to set their X factors.

Table 13 below summarizes these results.

Table 13
Selection of Tabulation Category for X Factors

Source	Percentage of Total Respondents	Percentage of Grouping
5 Sources		
Issue Age, Gender, Risk Class, Duration, Policy Form	16%	100%
Total	16%	100%
4 Sources		
Issue Age, Gender, Risk Class, Duration	24%	75%
Issue Age, Gender, Risk Class, Policy Form	5%	17%
Issue Age, Risk Class, Duration, Policy Form	3%	8%
Total	32%	100%
3 Sources		
Issue Age, Gender, Risk Class	8%	50%
Issue Age, Risk Class, Policy Form	3%	17%
Gender, Risk Class, Policy Form	5%	33%
Total	16%	100%
2 Sources		
Gender, Risk Class	8%	100%
Total	8%	100%
1 Source		
Risk Class	27%	100%
Total	27%	100%
Grand Total	100%	

The Survey asked the companies to identify the sources of mortality experience used to develop their X factors. The sources listed in the survey were own experience, industry experience, reinsurer's experience, and consultant's experience. 36 insurance companies responded to this question.

17% of the Respondents used three sources. Of these, 83% reported that they used their own experience, industry experience and experience from their reinsurer. The other Respondents reported that they used experience from a consultant (instead of their own experience) in combination with that of the industry and their reinsurer.

50% of the Respondents indicated that they used two sources. Of these, 67% indicated that they used their own experience and their reinsurer's experience. 22% reported that they used industry experience along with their own.

The remaining 31% of the Respondents indicated that they used only one source. Companies using only one source most often cited their own experience (55%). Use of reinsurer's experience (36%) ranked second.

Table 14 below summarizes these results.

Other sources identified through write-in comments included *mortality experience in the division* and *actuarial judgment*.

Table 14
Sources of Mortality Experience

Source	Percentage of Total Respondents	Percentage of Grouping
3 Sources		
Own, Industry, Reinsurer	14%	83%
Industry, Reinsurer, Consultant	3%	17%
Total	17%	100%
2 Sources		
Own, Industry	11%	21%
Own, Reinsurer	33%	63%
Industry, Reinsurer	3%	5%
Industry, Consultant	3%	5%
Own, Consultant	3%	5%
Total	53%	100%
1 Source		
Own	17%	55%
Industry	3%	9%
Reinsurer	11%	36%
Total	31%	100%
Grand Total	100%	

The Survey also asked companies to identify the primary source of mortality experience for the development of their X factors. Of the 34 insurance companies responding to this question, a company's own experience (58%) was cited most often, followed by their reinsurer's experience (28%).

One Respondent cited that they used a primary source not in the list of sources provided by the Survey. They did not specify what it was, so it is shown as "Other" in Table 15 below. Table 15 shows the prevalence of the primary sources reported.

Table 15
Primary Source of Mortality Experience for Development of X Factors

Source	Percentage of Respondents
Own	58%
Reinsurer	28%
Consultant	8%
Industry	3%
Other	3%

75% of the Respondents indicated that they used their own mortality experience either exclusively or in combination with other sources. Of this group, 71% indicated that their own experience was the primary source. The second most often cited primary source was reinsurers (21%).

Three of the four reinsurers responded to this question. Of these three, all of the reinsurers used a consultant and their clients' experience as sources for mortality experience in the development of the X factors. It was unclear whether it was the clients' total experience or just the reinsured experience that was used. One reinsurer included their own experience and another included their own experience and industry experience.

All three reinsurance Respondents cited the direct company's own mortality experience as the primary source of experience in the development of the X factors.

The Survey asked whether selective lapsation was accounted for in the mortality assumptions used to develop each company's X factors. Selective lapsation is important because according to Section 5(B)(3)(h) of Regulation XXX, "the appointed actuary shall specifically take into account the adverse effect on expected mortality and lapsation of any anticipated or actual increase in gross premiums." According to the Survey, 66% of the 35 insurance companies reported that they did not take selective lapsation into account. The remaining 34% reported that they considered selective lapsation in the development of their company's X factors.

None of the reinsurers reported that they considered selective lapsation in the development of the X factors.

A large number of Respondents may not have taken selective lapsation into account because their product's premiums were guaranteed to be level in the initial segment. In that case,

there would be no anticipated increase in gross premiums. Therefore, the Respondents may have considered it unnecessary to consider selective lapsation.

The Survey asked whether the X factors used in pricing during the calendar year 2000 were the same as the X factors used in valuation for calendar year-end 2000. 36 insurance companies responded to this question. 72% of the Respondents indicated that the X factors were the same and 28% responded that they were different.

Next, the Survey asked whether the X factors for year-end 2000 valuation were higher or lower than those used for pricing during the calendar year 2000. Only eight insurance companies responded to this question. In comparing these responses to how the company responded to the prior question, we believe that some of the companies may have misinterpreted this question. Therefore, we have decided to not include the results in this report.

The Survey asked if the companies planned to use the same X factors for 2001 pricing as they used in their 2000 pricing. 31 insurance companies responded to the question. 68% of the Respondents reported that the X factors would be the same and 29% indicated that they would be different. One Respondent indicated that they did not know if the X factors used in pricing would change for calendar year 2001 pricing.

Of the nine Respondents that reported that the pricing X factors would change in 2001, five indicated that the factors would be changed to the X factors used in 2000 valuation, one indicated that the X factors would be changed to something other than the X factors used in 2000 valuation, and three did not specify how they would change their X factors.

Table 16 below summarizes the last two questions on whether Respondents will continue to use the X factors involved in 2000 pricing.

Table 16
Use of 2000 Pricing X factors

	Did you or will you use 2000 pricing X factors in:	
Responses	**2000 Valuation?**	**2001 Pricing?**
Yes	72%	68%
No	28%	29%
Don't know	0%	3%

Only one reinsurer indicated that the X factors were the same in pricing and valuation. Two of the three reinsurers responding to this question indicated that the X factors used in pricing were higher than those used in valuation. One reason given for using higher X factors in pricing included intentionally increasing X factors in pricing in order to introduce a degree of conservatism.

Two of the three reinsurers indicated that they planned to use the same X factors for pricing in 2001 as were used in calendar year 2000. One reinsurer indicated that they were not certain whether the same X factors would be used.

The Survey continued to explore X factors by comparing the use of X factors between insurance companies and their reinsurers. The companies were asked to quantify the number of their reinsurers that used the same X factors as they did. 35 insurance companies responded to this question.

51% of the 35 Respondents indicated that they knew what X factors their reinsurers used. 31% indicated that they believed that all, most or some of their reinsurers used the same X factors as they did while 20% indicated that they believed that none of their reinsurers used the same X factors as they did.

These results are summarized in Table 17 below.

Table 17
Percent of Reinsurers Using the Same X Factors as the Insurance Company

How many reinsurers used the same X factors as the insurance company?	Percentage of Respondents
All	6%
Most	3%
Some	23%
None	20%
Don't know	48%

Section 3 – Annual Certification

The Survey asked companies about the annual certification process for X factors. 37 insurance companies and four reinsurers responded to all or part of this section.

The Survey asked whether anyone outside of the company helped with the X factor certification in 2000. 37 insurance companies and two reinsurers responded to this question. Table 18 below shows that 32% of the insurance companies that responded reported that they used a reinsurer for help with their X factor certification while 59% reported that they did not use any help. Only one Respondent reported using more than one source for outside help with X factor certification. This Respondent used both reinsurers and consultants. One Respondent indicated that they *did most of the work in-house, but used a consultant for peer review*. Finally, one Respondent indicated that they used some other outside help, but did not specify what that was.

Table 18
Outside Help Used for 2000 X Factor Certification

Type of Help	Percentage of Respondents
Reinsurer	32%
Consulting Actuary	8%
Other	3%
Didn't use outside help	59%

The two reinsurers that responded to this question indicated that they *used the client companies X factors* in their certification process.

Earlier in the Survey, companies were asked about the use of mortality experience in the development of X factors. In this section, companies were asked whether their own mortality experience was used in the certification process. 36 insurance companies responded to this question. 75% indicated that they used their own mortality experience and 25% indicated that they didn't use their own mortality experience.

Of the reinsurers, three indicated that they used their own experience and one did not respond to the question.

The Survey asked the Respondents who had indicated that they used their own mortality experience to provide the exposure year(s) used. 25 insurance companies responded to this question. Table 19 below shows the number of exposure years used by the Respondents who indicated that they used their own mortality experience in the certification process. 40% of the Respondents used one exposure year; this was the most common response. The next most common response was six years (20% of the Respondents). All but two of the Respondents used six years or less. The other two Respondents used 12 and 15 years of exposure. The use of this many years is surprising in that some of the older exposure may not be relevant for X factor certification.

There appears to be at least three possible explanations for the small number of years of exposure. First, a company may have credible experience from a limited number of years. Second, there may be some systems constraints, which restrict a company's ability to examine exposure prior to a certain date. Third, experience beyond the most recent issues may not be relevant for X factor certification.

Table 19
Number of Exposure Years of Mortality Experience Used

No. of Exposure Years	Percentage of Respondents
1	40%
2	4%
3	12%
4	8%
5	8%
6	20%
12	4%
15	4%

Two of the reinsurers provided the exposure years that they used. One indicated that they used two years and the other indicated that they used one year.

Table 20 below shows the exposure years used in the study. Since four of the Respondents only provided the number of exposure years and not actual exposure years, the percentages in Table 20 are based on the 21 (rather than 25) responding insurance companies. The four excluded from this table had exposure years of 1, 5, 6 and 12 years.

Table 20 shows that most Respondents used more recent mortality data, with 53% using year 2000 experience. The earliest data used was from 1985.

There are several things that the table does not show which should be pointed out. 33% of the Respondents used experience from exposure year 2000 only and 10% of the Respondents used experience from exposure year 1999 only. All but three of the Respondents used exposure years as recent as 1999 or 2000. The other three indicated that they used exposure years only as recent as 1998 (i.e., not 1999 or 2000).

Table 20
Exposure Years of Mortality Experience Used

Exposure Year	Percentage of Respondents
2000	53%
1999	43%
1998	43%
1997	33%
1996	29%
1995	24%
1994	19%
1993	10%
1985-1992	5%
Number of Respondents	**21**

Of the two reinsurers who responded to this question, one used year 2000 experience and the other used 1999 – 2000 experience.

Finally, this section of the Survey asked several questions related to reliance statements for X factors for the Respondents' reinsurers. The first was how many reinsurers are regularly used for Regulation XXX business. 32 insurance companies responded to this question. Table 21 below summarizes the results.

The most common responses were one reinsurer (25%) and two reinsurers (19%). 46% used four or more reinsurers. One Respondent indicated using as many as nine.

Table 21
Number of Reinsurers Used on a Regular Basis for Regulation XXX Business

Numbers of Reinsurers	Percentage of Respondents
0	3%
1	25%
2	19%
3	6%
4	16%
4-5	3%
5	9%
7	9%
8	6%
9	3%

The Survey then asked, out of the reinsurers regularly used for Regulation XXX business, how many requested a reliance statement for X factors and for how many was a reliance statement provided. 32 insurance companies responded.

69% of the Respondents indicated that a reliance statement was not requested by their reinsurers. Of the other 31% (10 Respondents), seven Respondents indicated that only one reinsurer requested a reliance statement and three Respondents indicated that two reinsurers requested a reliance statement for X factors.

It is interesting to note that, of the seven Respondents where one reinsurer requested a reliance statement, only five Respondents indicated that they provided these reliance statements. Two Respondents indicated that they did not provide a reliance statement, despite it having been requested. Of the three Respondents that indicated that two reinsurers requested a reliance statement for X factors, all three indicated that they had provided them. It was surprising that more reinsurers did not request reliance statements for X factors. Table 22 below summarizes these results.

Table 22
Number of Reinsurers Requesting a Reliance Statement
and Number of Reinsurers Provided with a Reliance Statement

Number of Reinsurers	Percentage of Respondents indicating Reinsurer Request	Percentage of Respondents indicating Reliance Statement Provided
0	69%	N/A
1	22%	16%
2	9%	9%

Section 4 - Quantification of the Impact of Regulation XXX

In this Section, the Survey attempted to quantify the decisions made in response to Regulation XXX. X factors, changes in the distribution of business by product line and reasons for premium rate changes were explored.

The Survey asked for the X factor (less than 100%) that was used for calendar year 2000 pricing and calendar year 2000 valuation for a male age 45, best nonsmoker class for a 20-year level term product with a 20-year premium rate guarantee (20/20). The Survey asked for X factors for durations 1, 2, 5, 10 and 20. Table 23 below shows the number of Respondents that reported X factors for calendar year 2000 pricing in the range shown in the table. Table 24 shows similar results for the X factors used for calendar year 2000 valuation.

Table 23 shows a concentration of X factors in the early durations (1, 2, 5) between 30% and 39.9%. In the later durations (10, 20), this concentration shifts to between 35% and 49.9%. The lowest X factor reported was 24% (duration 1) and the highest was 61% (duration 20). The average X factors reported began at 36.7% (duration 1) and grew to 40.6% (duration 20).

Table 23
Actual X Factors Used for 2000 Pricing
Male age 45, best nonsmoker class, 20/20 product

	Number of Respondents				
	Duration				
X factor	**1**	**2**	**5**	**10**	**20**
<30%	2	2	2	2	1
30-34.9%	6	6	6	5	2
35-39.9%	6	6	6	5	6
40-49.9%	5	5	4	6	8
50+%	1	1	2	2	2
Low	24.0%	25.0%	26.0%	29.0%	29.9%
Average	36.7%	37.3%	37.5%	38.7%	40.6%
High	50.0%	50.0%	50.8%	53.5%	61.0%

20 responded, 7 vary X factors by duration

Table 24 below shows the X factors Respondents reported that they used for 2000 valuation. These are a little higher than those reported for 2000 pricing. For valuation, the concentration in the early durations (1, 2, 5) is in the 35 – 39.9% range. For the later durations (10, 20), this concentration shifts to 35 – 49.9%. The lowest reported X factor was 24% (duration 1) and the highest was 68.2% (duration 20). The average X factors reported began at 38.3% (duration 1) and grew to 42.7% (duration 20).

Table 24
Actual X Factors Used for 2000 Valuation
Male age 45, best nonsmoker class, 20/20 product

	Number of Respondents				
	Duration				
X factor	**1**	**2**	**5**	**10**	**20**
<30%	2	2	2	2	1
30-34.9%	4	4	4	3	2
35-39.9%	8	8	8	7	6
40-49%	4	4	4	6	8
50+%	3	3	3	3	4
Low	24.0%	25.0%	26.0%	29.0%	29.9%
Average	38.3%	38.9%	39.3%	40.6%	42.7%
High	58.9%	58.9%	60.2%	64.0%	68.2%

21 Responded, 8 vary X factors by duration

The Survey asked for the volume of business (number of policies and face amounts) for three time periods and ten product structures.

The time periods requested were:
- Jan. 1 – Dec. 31, 1999
- Jan. 1 – Dec. 31, 2000
- Jan. 1 – June 30, 2001

The product structures requested were:
- 10-year level term, < 10-year premium guarantee (10/<10)
- 10-year level term, 10-year premium guarantee (10/10)
- 15-year level term, < 15-year premium guarantee (15/<15)
- 15-year level term, 15-year premium guarantee (15/15)
- 20-year level term, < 20-year premium guarantee (20/<20)
- 20-year level term, 20-year premium guarantee (20/20)
- 25-year level term, < 25-year premium guarantee (25/<25)
- 25-year level term, 25-year premium guarantee (25/25)
- 30-year level term, < 30-year premium guarantee (30/<30)
- 30-year level term, 30-year premium guarantee (30/30)

The reason this question was asked was to determine the shift in distribution by product due to Regulation XXX. Although both the number of policies and the face amounts were requested, face amount rather than the number of policies was used for this analysis because it was felt that this would portray a more reasonable distribution of the results. The face amount for each Respondent was totaled for each of the three years. The face amount by product structure for each Respondent was then divided into the total for that particular year. This was done for each Respondent for each of the three years. The result was a distribution by product structure for each of the three years for each company. The change in distribution for each company between 1999 and 2000 and between 2000 and 2001 was then analyzed.

Table 25 below shows the average distributions of all Respondents for each product structure and each year. The three largest structures were the 20/20 (35.2% in 1999), 10/10 (32.0% in 1999) and 20/<20 (10.9% in 1999). The 10/10 structure shows a decrease in distribution for both 2000 and 2001 (32% to 31.4% to 29.7%). The 20/<20 structure shows an increase from 1999 to 2000 and a slight decrease from 2000 to 2001. The 20/20 structure shows a decrease from 1999 to 2000 and then an increase from 2000 to 2001, but this increase was not enough to bring 20/20 back to its 1999 levels. The 30/<30 structure shows a large percentage increase from 1999 to 2000; however, it is still at distribution levels much below the 10/10, 20/<20, and 20/20 structures.

Table 25
Distribution of Business Pre and Post Regulation XXX
Average of Distribution Percentages by Product Type

Product Type	1/1-12/31/1999	1/1-12/31/2000	1/1-6/30/2001
10/<10	2.9%	3.8%	3.3%
10/10	32.0%	31.4%	29.7%
15/<15	1.7%	2.7%	2.3%
15/15	5.3%	6.1%	5.9%
20/<20	10.9%	14.7%	14.6%
20/20	35.2%	31.7%	33.6%
25/<25	0.0%	0.3%	0.2%
25/25	2.7%	2.0%	2.3%
30/<30	1.5%	5.4%	5.7%
30/30	7.9%	1.9%	2.4%
Number of Respondents	24	25	23

Analyzing the distribution data further, the 10/10 and 20/20 plans were observed independently and in combination with one another.

For the 23 10/10 Respondents, from 1999 to 2000, 11 showed a decrease in distribution, 11 showed an increase and one remained the same. From 2000 to 2001, 15 showed a decrease in distribution, six showed an increase and two remained the same.

For the 22 20/20 Respondents, from 1999 to 2000, 12 showed a decrease in distribution, eight showed an increase in distribution and two remained the same. From 2000 to 2001, almost the opposite occurred, nine showed a decrease in distribution, 11 showed an increase and two remained the same.

Table 26 below summarizes these changes.

Table 26
Change in Distribution for the 10/10 and 20/20 Structures – All Respondents

Product Type	10/10		20/20	
	1999-2000	2000-2001	1999-2000	2000-2001
Increase in Distribution	11	6	8	9
Decrease in Distribution	11	15	12	11
Remained the Same	1	2	2	2
Number of Respondents	**23**	**23**	**22**	**22**

To compare the results of 10/10 and 20/20 combined, only Respondents that had 80% or more of their distribution split between the 10/10 and 20/20 structures were studied. This reduced the number of qualifying Respondents to 14. Of this group, from 1999 to 2000, nine showed a decreased distribution in the 10/10 structure, while five showed an increase. From 2000 to 2001, these numbers changed to ten and four, respectively. For the 20/20 structure from 1999 to 2000, six showed a decreased distribution and eight showed an increase. From 2000 to 2001, these numbers changed to seven and seven, respectively.

Comparing the changes on a combined basis shows that the largest number of Respondents (six from 1999 to 2000 and eight from 2000 to 2001) indicated a decrease in distribution in the 10/10 and a corresponding increase in distribution in the 20/20.

These results imply a slight shift from the 10/10 to the 20/20 product. Table 27 below shows the results just described in the previous two paragraphs.

Table 27
Change in Distribution for the 10/10 and 20/20 Structures
Respondents with at least 80% in 10/10 and/or 20/20

Product Type	10/10		20/20	
	1999-2000	2000-2001	1999-2000	2000-2001
Increase in Distribution	5	4	8	7
Decrease in Distribution	9	10	6	7
10/10 decrease & 20/20 increase	6	6		
10/10 increase & 20/20 decrease	3	3		
10/10 & 20/20 decrease	3	4		
10/10 & 20/20 increase	2	1		
Number of Respondents	**14**	**14**	**14**	**14**

Results from the 30-year term structures were also analyzed. There were 12 Respondents who reported having a 30-year term product at least part of the time between 1999 and 2001. In 1999, seven reported distribution for the 30/30 structure and two reported distribution for the 30/<30 structure. In 2000, six indicated that they added 30/<30, one indicated that they added 30/30 and two indicated that they dropped their 30/30 structures (one replacing it with 30/<30 and the other eliminating the 30-year product). In 2001, one more Respondent indicated that they dropped their 30/30 structure. This is as was expected, a movement away from the 30/30 structures due to Regulation XXX, but not a complete elimination of the product structure.

Companies were asked why they made changes to their premium rates for their 20/20 and 20/10 products. A list of reasons was provided and write-in reasons were allowed. The main reason for premium rate changes to the 20/20 product was competition, but other popular reasons included change in agent compensation, change in level of expenses, change in underwriting and new product. Popular write-in reasons included XXX & reserve requirements and reinsurance support. All of the write-ins probably would have received even more responses if they had been included as choices in the initial list. For the 20/10 product, the main reason for changing premium rates was new product and the largest write-in reason was Regulation XXX and reserve requirements. Table 28 below shows the results of all reasons, including the write-in responses.

Table 28
Reasons for Premium Rate Changes

Listed Reasons	20/20 Product			20/10 Product		
	1999	2000	2001	1999	2000	2001
Anticipation of 2001 CSO	0	0	0	0	0	0
Change in agent compensation	1	3	3	0	0	0
Change in level of expenses	1	3	4	0	1	0
Change in underwriting	1	3	2	0	1	1
Competition	7	10	5	0	1	1
Misjudged market	0	1	0	0	0	1
New emerging mortality experience	2	1	1	0	0	0
New product	3	3	2	1	5	0
Offshore facilities	0	2	0	0	0	0
Write-in Reasons						
XXX & reserve requirements	1	8	1	0	3	0
Reduced guarantee period	0	0	0	0	1	0
Reinsurance support	2	3	2	0	0	0
New underwriting class	0	1	0	0	1	0
New option	0	0	0	0	1	0
Expected anti-selection	0	1	0	0	0	0
Premium illustrations - move to fully guaranteed plan	0	0	1	0	0	0
Number of Respondents	11	17	6	1	10	1
Number of Respondents with >1 change	2	2	0	0	1	0

Section 5 - Miscellaneous

This section of the Survey sought to explore companies' future plans for dealing with Regulation XXX. Companies were asked if they planned to make changes in 2001 in the following three areas: certification process, product design and X factors. 49 insurance companies responded.

With regard to the certification process, 17% of the Respondents indicated that they plan to change their certification process in 2001. The four specific comments regarding this change concerned improved mortality analysis.

Regarding product design, 25% of the Respondents indicated that they plan to revise product designs in 2001. Four specific comments involved introduction of longer term (such as 20-year) guarantee products. One Respondent indicated that they plan to eliminate short-term guarantee products. A couple of comments involved changing underwriting classes.

27% indicated that they plan to change X factors. One Respondent indicated that they plan to change from 100% factors to some lower value.

Some interesting results can be obtained by comparing the responses in this section to some of the first section responses. In comparing future plans with past activities, it was found that, of the insurance companies that had done little to respond to Regulation XXX, only 21% planned to address Regulation XXX this year. Of the insurance companies that changed products in response to Regulation XXX, 32% indicated that they would make further changes this year. Of the insurance companies that had not changed products, only 13% indicated that they would adjust products this year.

Of the insurance companies that changed product design and rates due to Regulation XXX, 29% indicated that they would change their X factors this year, 34% indicated that they would change their products and 24% indicated that they would change their certification process.

Companies were asked what they found difficult about compliance with Regulation XXX and what advice they would give to someone just beginning to work on it. The difficulties mentioned included the limited time available to accomplish certification, the lack of mortality experience pertinent to certification and the complexity of the regulation. In addition, two Respondents specifically mentioned Section (5)(B)(3)(d & e) (compliance with X factor requirements). The other issue mentioned was trying to compete with companies either not subject to Regulation XXX or those that found ways to alleviate the full impact of Regulation XXX.

Finally, companies were asked to provide suggestions to someone just beginning to understand Regulation XXX compliance. Advice could be grouped into two areas: education and planning. The primary suggestion was to *study hard, get help, and don't assume you know enough*. Another suggestion was to *allow lots of time and plan for a big project*.

From the varied responses to the Survey, it appears that there is a wide spectrum of responses to Regulation XXX. Some companies have made a number of changes and plan to make additional changes, while others indicate that they have done little or nothing in response to Regulation XXX.

Appendix 1
Companies Participating in Regulation XXX Survey

AEGON Special Markets Group
AEGON USA
Allstate Life Insurance Co.
American Bankers Life Assurance Co. of Florida
American Community Mutual Insurance
American Family Life Insurance Co.
American United Life Insurance Co.
Americom Life & Annuity Insurance by Buchanan & Assoc.
AmerUs Life Insurance Co.
Amica Life Insurance Co.
Berkshire Life Insurance Co. of America
Business Men's Assurance Co.
Combined Insurance Co. of America
Cotton States Life Insurance Co.
Country Insurance & Financial Services
CUNA Mutual Life Insurance Co.
Empire General Life Assurance
ERC Life Insurance Co.
ERC Life Reinsurance Corp.
Federated Life Insurance Co.
General American Financial Co.
General American Life Insurance Co.
Guardian Life Insurance Co.
Hannover Life Reassurance Co. of America
Harleysville Life Insurance Co.
Illinois Mutual Life Insurance Co.
Inter-State Assurance Co.
Investors Heritage Life Insurance Co.
Legal & General America Inc.
Liberty Life Assurance of Boston
Lincoln National Life Insurance Co.
Lutheran Brotherhood
Mennonite Mutual Aid Association
Midland National Life Insurance Co.
National Life Insurance Co.
National Travelers Life Co.
North American Co. for Life & Health
Pan-American Life Insurance Co.
Penn Mutual Life Insurance Co.
Primerica Life Insurance Co.
Royal Neighbors of America
Security Financial Life Insurance Co.
Security Mutual Life Insurance Co. of NY
Southern Farm Bureau Life Insurance Co.
State Farm Life Insurance Co.
Swiss Re Life & Health America Inc.
TIAA-CREF Life Insurance Co.
Transamerica Occidental Life
Travelers Life & Annuity Co.
United Farm Family Life Insurance Co.
UnumProvident Group
USAA Life Insurance Co.
Woodmen Accident and Life Co.