

## NEW YORK COMPENSATION RATE MAKING

BY

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At the November 1939 meeting, a paper entitled "The Practice of Workmen's Compensation Rate Making as Illustrated by the 1939 Revision of New York Rates" was presented by Mr. C. M. Graham. In 1940, the writer presented a short paper discussing changes which had taken place in the 1940 revision.

Since that time a lot of water has passed over the dam and the present rate making procedure, particularly with the 1948 changes, is rather different. It would seem timely to bring things up to date.

### I. 1941 to 1946

From 1941 to 1946, the New York Compensation rates were revised annually to reflect (1) the experience of the latest composite policy year, (2) law amendments passed by the New York Legislature, (3) increases in the Workmen's Compensation Board assessment factor, and (4) exclusion of the Security Funds factor in 1944 because the stock Security Fund had reached its statutory requirement.

#### A. Revised Rate Making Procedure

Late in 1943, the subject of revising the rate making procedure to minimize the results of the abnormal experience due to war contracts, the dislocations of industry due to wartime activity, and the shortage of trained personnel in the offices of the carriers, had been under discussion in the National Council on Compensation Insurance as well as in the Compensation Insurance Rating Board. The National Council forwarded a proposal to revise the determination of classification rates, stating that it was necessitated by the following considerations:

- (1) The fact that the then present rate making procedures were not sufficiently responsive to the great difference between conditions being encountered and those reflected in the experience which normally would have been used.
- (2) The difficulties encountered by carriers and rating organizations in maintaining a complete statistical program.
- (3) The unsatisfactory manner in which the contingency loading program was operating.

The following revised rate making procedure, corresponding to the National Council proposal except for amendments to reflect New York Conditions, was adopted to become effective with the July 1, 1944 rate revision:

- (1) Determine the rate level from the latest composite year July to June. (No change.)

(2) Discontinue the National Council Premium and Loss Exhibit, industry group rate levels, and projection factors.

(3) Compile the classification experience exhibits using the two latest available policy years of experience. (1940 and 1941 at the 1944 rate revision.) Modify actual incurred losses only by law amendment and development factors, and adjust medical losses for ex-medical coverage.

Development factors from the preceding rate revision (based on a greater number of years of experience) were to be used, thus introducing stability and avoiding the erratic swings which had developed in the past under the National Council method of computing development factors.

(4) Formula rate against the underlying pure premiums without adjustment, using the National Council credibility criteria.

(5) Apply a final correction factor to the selected pure premiums in order to reproduce the adopted rate level.

(6) Discontinue the contingency factor program.

On the recommendation of the Classification and Rating Committee, a 20% limitation was imposed on the change of the selected pure premium from the underlying in order to avoid radical changes which might result from the substitution of a two year for a five year experience period.

#### B. *Minimum Premiums*

Effective July 1, 1942, the minimum premium procedure, which had been under attack for some time, was revised as follows:

(1) Except for certain special classifications, no minimum premium shall exceed \$100. (This particularly affected the contracting classifications.)

(2) The minimum premium corresponding to the governing classification shall be the minimum premium for the policy (instead of the average of the two highest classes shown in the policy).

Various suggestions for amending the minimum premium *formula* were studied, but no change therein was adopted.

#### C. *Elimination of Overtime Wages—Wartime Emergency*

Our entrance into the war brought about considerable increase in overtime labor and it was generally recognized that premium wages paid for overtime do not accurately measure the exposure. Since this seemed to be a national problem, a Special Committee on Overtime Wages was appointed by the National Council to study the subject.

After much study, this Committee reported that the best interests of the business required recognition of the situation and that reduction or elimination of overtime remuneration would stabilize future rate making as well as afford current relief.

In New York, after reflecting on the additional audit problems which

would be created by such a program, the Rating Board, in November 1943, filed a plan providing for excluding all wages earned in excess of normal rates of pay in the calculation of premium, provided the assured maintains books and records which show such overtime wages separately, both by individual employee and by classification. This proposal became effective January 1, 1944 as a wartime emergency measure but is still in effect.

#### D. *Payroll Limitation*

The question of the proper base for premium computation purposes is an old one and much has been said and written on the subject. It is generally conceded that a man-hour basis would most accurately measure the exposure to hazard, thus eliminating all questions of overtime, vacation, sickness, bonus or inflated wages, but the practical difficulties to be overcome in (1) determining man-hours on audit since few employers keep suitable records and (2) in converting our present rates and experience to a man-hour basis are, to all intents and purposes, insurmountable.

The payroll base, although more complicated in recent years by the elimination of overtime, has generally worked out well over a long period. There are, however, certain types of individuals, whose unusually high remuneration cannot be defended on any grounds as a true measure of the hazard involved. A specialty salesman, working on salary and commission totaling \$20,000 or more can hardly be considered a worse risk than another who ekes out \$52.50 a week in the same class of work. Each will receive \$32 per week compensation and unlimited medical when injured, yet the premium charge in one case would have been more than seven times as great.

One case, in particular, which came before the Classification and Rating Committee, served to point up this situation and bring about a measure of relief. A trainer of horses was employed by a well-known racing stable, his remuneration consisting of salary plus 10% of all purses won by his horses. The stable had a very successful season, winning more than \$500,000 in purses, so that the trainer's remuneration was nearly \$60,000. Since he was classified as #8280—"Racing Stables Operation" with a manual rate of about \$8.00, the premium on this one man amounted to nearly \$5,000.

Effective October 1, 1946, a proposal was adopted limiting payroll for premium computation purposes to an average of \$100 per week for the period covered. While this limitation has further complicated payroll audit problems, particularly in these inflationary times when \$100 a week salaries are not uncommon in many industries, it is generally felt that such a plan will operate for the best interests of the industry. Any attempt to reduce the limit to \$75, \$50 or the current effective wage (150% of the maximum weekly benefit) will so complicate payroll auditing as to create an intolerable situation.

#### E. *Specific Occupational Disease Rates*

At the July 1, 1943 rate revision, separate rates for specific occupational disease coverage were discontinued and losses incurred under Article 4-A of the New York Workmen's Compensation Law were included in the regular classification experience, but adjusted to the current maximum benefit level of such losses.

### F. *Special Disability Fund*

In 1945, the Legislature passed an act designed to encourage the employment of physically disabled persons, setting up a Special Disability Fund. When an employee who has a previous physical impairment (the courts have interpreted this to mean that the employer must have prior knowledge of it) is injured, and the disability is aggravated or increased because of the previous impairment, the carrier will pay compensation and medical in full, but may be reimbursed by the Fund for all payments after the first 104 weeks. The 104 week figure is purely arbitrary and is designed to avoid any necessity for proving how much of any disability is due to the previous impairment and how much to the subsequent injury. The Fund was established by assessing all carriers and self-insurers 1% of their compensation loss payments during the first year, and is maintained by annual assessments of the amounts paid out of the Fund, on the same basis. (Currently, this assessment amounts to about 0.2% of paid compensation losses.)

Question arose as to how such cases would be treated in rate making. It was readily determined that only the first 104 weeks would be included in classification rate making, experience and retrospective rating in order not to penalize the individual assured or classification of risks which employs disabled persons in accordance with the intent of the Law. The balance over 104 weeks must, however, be included somehow in the overall rate level so that the carriers can pay the assessments. It was decided to include all cases at full cost in the experience underlying the rate level in order to provide the carriers with sufficient funds at the time the cases are incurred to meet subsequent assessments as they fall due. Since many cases are not recognizable as Special Disability Fund cases at the time of the first reporting, this method avoids doubling up when such cases are later determined to be Special Disability Fund cases and payments out of the Fund are made. Furthermore, it provides a more proper charge on the assureds who are liable for such cases. A new risk, entering the state ten years hence, will not be required to pay for the old cases, since they are currently reflected in the rate level shortly after they occur.

## II. 1947

### A. *Classification Relativity*

In the Report on Examination of the Compensation Insurance Rating Board made in 1945 (filed July 23, 1946), the Examiner outlined the then current method of determining classification relativities, and followed with these paragraphs:

"Although no provision is made in the . . . schedule for graduation of the credibility below 20%, in a number of classifications, particularly New York Special classes, a credibility of 10% was allowed in order to permit revision of the pure premium.

"It is the practice with some exceptions to continue the underlying pure premium for those classifications where the New York exposure is too small to warrant any credibility. As a result, in the 1944 revision, the continuance of underlying pure premiums was indicated for approximately 235 classi-

fications, although departures from procedure were recommended and adopted for about 50 of such classes. If, however, the method of selection for the classes which do not warrant credibility, is continued year after year, many of such classifications will vary only with the average rate level even though the classification experience will have been favorable over a long period. In view of the use of only two years experience for classification relativity purposes, it is likely that a substantial number of classes will not be eligible for credibility.

"It is suggested that for such classifications either a broader base be considered for credibility purposes or some recognition in revision be given to those classes which consistently produce a loss ratio below a certain level."

As a consequence of these and other recommendations, a joint subcommittee of the Actuarial and the Classification and Rating Committees was appointed. After considerable study, the following procedure was adopted and approved by the Superintendent of Insurance:

- (1) Extend the present tables of credibility downward to provide for 10% credibility.
- (2) Allow a minimum credibility of 5% for any partial pure premium which does not qualify for 10% credibility.

#### B. *Rate Filings Disapproved*

Subsequent to this action, the rate revision was prepared and filed otherwise in the same manner as in previous years. Although there were no 1947 law amendments affecting the cost of compensation (except S.O.D.), increases had been approved effective June 1 in lines 49-54 of the Minimum Medical Fee Schedule, and a new hospital agreement had increased the daily rate for hospital care effective January 1, 1947. The discontinuance of cash discounts on large medical bills also increased medical costs. These changes, estimated to increase medical losses by 16.5%, were treated in the same manner as law amendments. 16.5% of medical was equivalent to 4% of total losses.

The adopted rate level was, by coincidence, an increase of 4%, as follows:

$$.985 \times 1.040 \times 1.013 \times 1.002 = 1.040$$

where: .985 was the indicated change from experience alone

1.040 was the medical "law amendment" (1.165 on medical losses)

1.013 was the Security Funds Factor (reintroduced)

1.002 was the estimated effect of the S.O.D. law amendment

A separate filing was made, requesting a 4% increase on outstanding business June 1, 1947 to reflect the medical "law amendment."

Two Department Examiners were directed to examine both filings and the result of their examination was a memorandum recommending disapproval of both filings and attacking practically every element of the revision:

### 1. *Revisions in Medical Fee Schedule and Hospital Per Diem Schedule*

In order to estimate the cost of these changes, the Board had collected data from seven carriers (members of the Medical and Claims Committee) on medical payments made during a given month. Although this was the only material available on the subject, and had been collected without bias, the Examiner criticized the data from every angle, with particular emphasis on the fact that there was considerable variation between carriers reporting. Admittedly, the study, which covered payments in some 18,000 cases, was a relatively small sample, but the Rating Board felt that it was the best available method of estimating the increased costs.

### 2. *Workmen's Compensation Board Assessment*

The Actuary of the Rating Board had estimated, based on the latest available data, that the assessment for the expenses of the Workmen's Compensation Board for the year ending March 31, 1947 would be 6.3%. The Examiner, using even later information, estimated 5.8%, and indicated the rate filing to be excessive by the amount of the difference.

The actual assessment, as levied by the Workmen's Compensation Board late in 1947, was 6.24% of paid compensation losses.

### 3. *Security Funds Factor*

Although the Department had not officially ruled whether payments would be required to be made to the Stock Security Fund beginning with the third quarter of 1947, information available to the Board indicated that such payments should be required, and the necessary factor was put into the rate structure.

The Examiner, estimating that that Fund would be only \$88,000 short of the statutory minimum (5% of outstanding losses) suggested that the Superintendent could waive the required payments, thus reducing the rate level by 1.3%.

The Law does not appear to permit the use of discretion, merely requiring payments when the Fund (as of any December 31) falls below 5% of the outstanding losses. As a matter of fact, although the rates including provision for the Security Funds Factor were disapproved, the stock carriers were required to make payments into the Fund for the year beginning July 1, 1947.

### 4. *Catastrophe Loading*

The Examiner criticized as excessive the current catastrophe loading of one cent in each manual rate. He quoted figures to show that the loss ratio in recent years has been about 15%. The current loading can be justified on the basis that in many cases it is less than the actual cost of catastrophe reinsurance. Furthermore, the loss ratio over a relatively short period is meaningless in view of such occurrences as the Texas City disaster, which, fortunately, happen only at great intervals.

### 5. *Development Factors*

The Examiner criticized the loss development factors produced by the Board program which will eventually encompass ten composite years of

experience. He pointed out the variation between stock and non-stock carriers, cited certain State Fund factors which were unusual, and pointed out that the Court of Appeals decision in applying the \$28 compensation rate to cases occurring prior to June 1, 1944 had affected the development factors for certain years.

Inasmuch as development indications for the latest policy years are generally higher than the adopted averages, the Board feels that the latter are conservative. Insofar as they reflect the actual experience of the various types of companies, they are valid and the indications should be used.

When the \$28 question was raised again in 1948, it was shown to the satisfaction of the Department that this decision had only a minimum effect on the development factors. Whatever effect it did have is justified as the only means available to the carriers for recouping some of the loss sustained as a result of the 1944 "retroactive" legislation.

#### 6. *Wage Changes*

A major portion of the Examiner's memorandum was devoted to a discussion of the increased wage levels and the failure of the Rating Board to recognize this factor in the rate filing.

Aside from the fact that no wage factor had been used in New York Compensation rate making in over twenty years and the Board had had no indication prior to making the filing that one was expected, there did not (and still does not) appear to be any practical method of making a proper adjustment.

It is apparent that the general wage level has increased, but it obviously has not increased equally in all industries, nor is it consistent within any particular industry in various sections of the state.

Even assuming that an accurate overall wage factor could be determined, there are many reasons why its use is not advisable. Such a factor, to be fair, must be applied whether wages are going up or down. A downward trend is extremely difficult to measure and its application would result in higher rates at the time of a depression. While desirable from the standpoint of the companies, it is likely that such a storm of protest would result that the factor would be speedily discarded. Furthermore, any wage factor inserts into the rate structure an element of guesswork or prognostication which is subject to criticism by supervisory authorities and by employers whose own particular wage rates have not followed the general trend.

Since rates made for a particular July 1 will be in effect on some policies nearly two years later, no one can predict the situation that far in advance. By that time, wages may have fallen considerably or may have risen out of sight. Rates are never claimed to be exactly right for the period they are in force, but always being keyed to the latest available experience, the overall picture over a number of years should produce the desired effect.

It should be noted that the Insurance Department, in its many suggestions for the 1948 revision, did not request a wage factor, as such,

but rather felt that the matter could be taken care of by a Rate Level Correction Factor.

After a statutory hearing before Deputy Superintendent Martineau, at which the Rating Board presented a brief in defense of its filings, a "no opinion" decision dated July 15, 1947 was issued which merely disapproved both filings. Since the Rating Board was not advised as to the grounds on which the filings had been disapproved the July 1, 1946 rates remained in effect. The 1946 rates for some 64 classifications were at least 15% inadequate on the basis of the 1947 classification experience, in view of the fact that the classification relativity was not brought up to date.

### C. *Silicosis and Other Dust Diseases*

Article 4-A of the New York Workmen's Compensation Law in 1936 had provided, among other things, for a maximum compensation of \$500 for cases occurring in June 1936, such maximum increasing by \$50 per month. Subsequent amendment continued the "escalator provision" up to a maximum of \$5,000 in December 1943. In 1944, an amendment provided for a new maximum of \$6,500 and in 1946, the maximum was increased to \$7,500.

In 1947, Article 4-A was repealed and silicosis and other dust diseases were included in the Law with unlimited compensation and medical. It was provided, however, that when disability and death occur after July 1, 1947, the carrier will be reimbursed by the Special Disability Fund for all payments in excess of the first 260 weeks. Where disability occurred prior to that date, but death occurred thereafter, the carrier's liability is limited to the first 104 weeks.

As in Special Disability Fund cases, such cases are included in the rate level at their full value, but limited in classification experience, experience rating and retrospective rating.

## III. 1948

### A. *Insurance Department*

Late in 1947, Mr. Arthur L. Bailey, a member of this Society, was appointed to the new position of Chief Actuary of the Insurance Department. The apparent purpose of this appointment was to enable the Department to maintain a closer contact with the technical committees of the Rating Board and to promote the mutual exchange of opinions prior to action being taken.

At an informal conference with the members of the Governing Committee and staff of the Rating Board, the Superintendent of Insurance indicated that it was his opinion that there were a number of hidden profits or "bones" in the rate structure which should be exhumed and replaced by a definite profit loading in the rates. Chief Actuary Bailey subsequently advised the Actuarial Committee as to the nature and location of the "bones" to which the Superintendent had referred. Some of these the Committee was able to justify, some were shown to have little or no effect and some required correction. Most of the 1948 changes in procedure were caused by the elimination of "bones" and the inclusion of profit loading. There were three major changes and a number of minor ones, as follows:



## B. Major Changes in Rate Making Procedure

### 1. Workmen's Compensation Board Assessment

As a factor applied to indemnity losses, this factor previously received the full expense loading. The Department felt that the loading should be limited to acquisition and taxes. The Actuarial Committee, while seeing the logic of this argument, felt that a dangerous precedent would be set by applying partial expense loadings rather than have expense as a function of the final rate. There are other elements here and elsewhere which might be similarly construed, which might lead to innumerable complications.

In the final analysis, however, the Governing Committee decided to concede this point in partial recognition of the inclusion of a profit loading. A reduced Workmen's Compensation Board factor was adopted, such that when the full loading was applied to it, the result was equivalent to the full factor loaded only for acquisition and taxes.

$$\frac{6.6\%}{.800} = \frac{4.8\%}{.585}$$

### 2. Profit Loading

This question soon resolved itself into two components—(a) Should there be a profit loading? (b) How much should it be?

The opponents of a profit loading felt that since Workmen's Compensation is a social insurance, required by law, it is not fitting to include a profit loading, as such, but rather to let a "profit incentive" be the reward for handling the business. It was stated that when the New York Compensation Law was passed in 1914, consideration had been given to a monopolistic state fund, but the private carriers had been allowed to enter the field on a non-profit basis.

The proponents, on the other hand, pointed out that the Superintendent of Insurance, to all intents and purposes, had instructed the Rating Board to include a profit loading in the 1948 rate filing. It was argued that the revised rating law gives the Superintendent a mandate that rates for workmen's compensation shall contain a "reasonable profit."

Consequently, on May 18, the Governing Committee adopted a "contingency or profit loading of 2.5 points." This would have increased rates by 4.3%.

$$\frac{.600}{.600-.025} = 1.043$$

On June 2, the Rating Board received a letter signed by Deputy Superintendent Martineau commenting on various phases of the rate revision. It was indicated therein that the Department felt that the 2.5 point loading was excessive and "suggested" a *profit provision* of 1.5 points, until such time as data could be produced which would justify this or some other figure. Although the Governing Committee still felt that 2.5 points was the proper figure, it was obvious that nothing higher than 1.5 points would be approved. Rather than jeopardize the entire filing, a "profit provision of 1.5 points" was adopted.

### 3. Rate Level Adjustment Factor

The National Council, cooperating with the N.A.I.C., had been studying the subject of a rate level adjustment factor which, based on recent calendar year experience, could be used to adjust rate levels not only to reflect current wages, but any other current conditions which differ materially from those in the experience period. The original program, as proposed by the National Council, called for determining the ratio of incurred losses to earned premiums for the two latest calendar years directly from the Casualty Experience Exhibits. This ratio would determine a factor to be applied to the rate level otherwise adopted.

At the December 1947 meeting of the N.A.I.C. in Miami, Deputy Superintendent Martineau read a memorandum outlining the following objections to this program, if applied in New York:

(1) The use of "net" premiums, thus including the effect of premium discount and retrospective rating.

(2) Failure to adjust premiums to the current rate level.

(3) Failure to recognize interest earnings on long-term cases.

The Actuarial Committee recognized the validity of (1) and revised the program to eliminate the effect of retrospective rating and premium discount by converting to a "standard premium" basis. Otherwise, it could be argued that the Factor is an attempt to retrieve a portion of the premium credits allowed under those plans. The Committee felt, however, that if the premiums were to be converted to the current rate level, the losses should also reflect the current loss level, but decided, in the interests of simplicity, to make no adjustment of this type. A test was made, however, which indicated a higher loss ratio on the adjusted basis.

In order to eliminate the effect of interest earnings on long term cases, the Committee limited the premiums earned and losses incurred in each calendar year to the latest four policy years in each case. For calendar years 1946 and 1947 on this basis, the premiums earned amounted to \$312,030,342 and the losses incurred to \$177,781,916, which is a loss ratio of 56.98%. The average permissible loss ratio, allowing for the Workmen's Compensation Board Factor, was 57.64%, so that the ratio of

$$\frac{56.98}{57.64} = .989$$

falls in the neutral zone, and a Rate Level Adjustment Factor of 1.000 was adopted.

In the subsequent approval of the rate filing, this factor was approved for this revision only, subject to further study by the N.A.I.C.

### C. Minor Changes

There were a number of minor changes in method suggested by the Insurance Department. In most cases the Rating Board felt that these changes constituted improvements and readily agreed to them:

#### 1. Pure Premium Correction Factors

It was suggested that separate pure premium correction factors for serious, non-serious and medical, keyed to the corresponding losses in

rate level, be used instead of a single factor. The Actuarial Committee adopted the suggestion, but later, because of the fact that the substantial 1948 law amendments had not been reflected in the underlying pure premiums, only separate factors for indemnity and medical were adopted for this revision.

### 2. Application of New Law Amendments in Rate Level Determination

The current procedure had been to determine a loss ratio exclusive of the latest law amendments, and separately determine the effect of the new law amendments. The product would then determine the rate level change.

It was pointed out that under this procedure the average law amendment factor was applied to this assessment, whereas it should only be affected by amendments to indemnity losses, and thus bias was introduced. While this bias could go in either direction, it seemed advisable to determine the loss ratio directly on the basis of losses adjusted to the latest level.

For example, in the 1947 revision, the rate level loss ratio prior to the Workmen's Compensation Board factor was:

$$\frac{\$ 71,541,892}{\$126,566,408} = 56.53\%$$

The Workmen's Compensation Board Assessment was 6.3% of the New York indemnity losses of \$51,592,306, or \$3,250,315.

$$\frac{71,541,892 + 3,250,315}{126,566,408} = 59.09\%$$

$$59.09 \div 60.00 = .985$$

$$.985 \times 1.042 \times 1.013 = 1.040 = \text{adopted rate level}$$

where: 1.042 was the 1947 law amendment factor

1.013 was the Security Funds Factor

Under the proposed method, with losses adjusted to the 1947 level, the figure of \$51,592,306 becomes \$51,730,706 and \$71,541,892 becomes \$74,532,649, and the result would have been:

$$\frac{74,532,649 + 3,259,034}{126,566,408} = 61.46\%$$

$$61.46 \div 60.00 = 1.024$$

$$1.024 \times 1.013 = 1.037$$

Since the 1947 law amendment was practically all applied to medical losses, the rate level was too high by .3%. Normally, however, with law amendments on indemnity losses, it would be too low.

### 3. Pure Premium Limitation

The normal pure premium selection program calls for limiting the change in total pure premium to 20% from the underlying. Because

the 1947 rate revision had been disapproved, there were considerably more classifications in 1948 where the formula pure premium indicated a change of more than 20% (mostly upward). In order to overcome this difficulty, the Insurance Department suggested the following method of permitting changes of more than 20% under certain conditions:

The selected pure premium shall be limited to 20% change unless the indications of each of the two policy years represent a change of more than 20% in the same direction, in which case:

(1) the formula pure premium shall be selected if it lies between the underlying pure premium and the nearest (to the underlying) of the policy year indications.

(2) the nearest (to the underlying) of the policy year indications shall be selected if the formula lies between the two policy year indications.

This procedure worked very well at the 1948 revision, permitting changes of more than 20% where a definite trend was indicated. Although there should be less necessity for such a rule in future years, it could well be continued as a permanent part of the rate making program.

#### D. *No Change Adopted*

On two points raised by the Insurance Department, the Rating Board, after considerable study and analysis, was able to convince the Department that no change was necessary.

##### 1. *Development Factors*

Question was raised as to whether the decision of the Court of Appeals applying the \$28 compensation rate to cases occurring prior to June 1, 1944 had not increased the development factors for policy years 1941 to 1944 out of line with expected conditions for the future.

It was pointed out (a) that the third reporting of many such cases had been filed prior to this decision, and thus had no effect on the development factors, and (b) in no case was more than three years of compensation (June 1, 1944—June 30, 1947) reported at the \$28 rate, which is a maximum increase of \$468 per case.

##### 2. *Interest Earnings*

In the rate making formula "Premium = Losses + Expenses," the loss element is valued as of 42 months (third reporting) while the other elements are valued as of some time during the policy year. The Insurance Department felt that this represents a substantial provision for profit which should be eliminated and replaced by a specific loading in the rates. The following example was presented in support of the contention:

		Average	Discount
		Years After Effective Date	(1) × 2%
		(1)	(2)
Assumed incurred losses as of 42 months . . . . .	\$1,000,000		
First 12 months—amount paid or settled . . . . .	250,000	½	1%
Second 12 months—amount paid or settled . . . . .	150,000	1½	3%
Third 12 months—amount paid or settled . . . . .	150,000	2½	5%
Next 6 months—amount paid or settled . . . . .	50,000	3¼	6½%
Reserve as of 42 months . . . . .	400,000	3½	7%

Assumed premium collection = 6 months after policy inception  
 Assumed interest rate = 2%

A subcommittee of the Actuarial Committee was appointed to study this subject in every aspect and the following report of that subcommittee was transmitted to the Governing Committee and the Insurance Department and was the basis for no action being taken in the matter:

*Report of the Subcommittee on Interest Problems*

“The Subcommittee has devoted its attention to making an appraisal of probable interest earnings inherent in the conduct of the workmen’s compensation business in New York State.

“The problem was centered upon obtaining a parallel distribution of premium income and loss payments for typical carriers. The policy year experience seemed to be the only available basis for making a study of this character. Using this distribution as a basis for income and loss payments, and distributing the expense provisions on the basis of known or estimated incidence, net cumulative balances were ascertained for short intervals covering a 48-month history on a policy year’s operations. Separate calculations were made for each type of carrier to recognize differences in methods of operation. The accumulated balances were then converted to the equivalent period for which the full premium was available for investment. This analysis showed that for private carriers the equivalent period was slightly less than one year, and for the State Insurance Fund the equivalent period was somewhat more than one year for obvious reasons such as the retention of liability on all fatal cases and deferred dividends on special groups. These reasons motivated the Subcommittee to center its attention on the results for private carriers.

“It might be mentioned that the distribution of paid and outstanding losses at the end of 48 months showed a reasonable agreement with what may be anticipated in view of different methods of operation.

“The analysis to this point disregards the outstanding losses beyond 48 months, the approximate equivalent of third reportings under the Unit Statistical Plan. From the figures available it is estimated that the unpaid losses as of 48 months amount to 12% of premiums, of which approximately one-third or more are reserved on a tabular basis at an interest rate of about 2½%. To the extent that private carriers are earning less than 2½% net effective interest, these cases are creating an interest deficiency. The nature of the residual cases is such that they will be liquidated within a

relatively short interval and the Subcommittee estimates that these cases may add 0.1 to 0.2 years to the equivalent period previously estimated at slightly less than a year. The interest deficiency on the tabular cases mentioned above offsets in part or in total this indicated increment.

"In the judgment of the Subcommittee the complete estimate of the equivalent period of time would not be more than 1.1 years.

"Proceeding from this point, the Subcommittee discussed at great length various concepts of interest rates as related to the present problem, as follows:

1. In any quantitative appraisal of the equivalent period determined by the Subcommittee's analysis, the interest rate should reflect opportunities for investment in the present and immediate future rather than be based upon past experience. This point is particularly cogent with regard to carriers newly entering the compensation field.
2. In actual practice, only a portion of available monies can be put into productive investments immediately.
3. In the interest of public policy it would be unwise to motivate insurance carriers to meet a predetermined interest requirement. Up to the present, casualty companies' investment policy has been a prerogative of management.
4. In the past, company results have differed to a considerable extent. For example, a brief review of 1946 interest earnings in relation to investable assets of members of the Compensation Insurance Rating Board shows a range from 1.1% to 3.3% with a concentration around 2.0% to 2.5% before Federal taxes to which, of course, all private carriers are subject. These figures are influenced to some extent by investments made under more favorable conditions than exist at present as well as differences in investment policy.

"In conclusion, in the opinion of the Subcommittee the interest earnings expressed as a percentage of New York State compensation premiums may be estimated for an individual carrier from the following table:

Yield on Investable Assets Before Federal Taxes	After Federal Taxes	Assumed Maximum Equivalent Period	Percentage of Premium
1.0	0.6	1.1	0.7
1.5	0.9	1.1	1.0
2.0	1.2	1.1	1.3
2.5	1.5	1.1	1.7
3.0	1.8	1.1	2.0

#### E. 1948 Rate Revision

##### 1. Rate Level

The 1948 adopted rate level change was an increase of 6.3%, which can be analyzed as follows:

$$1.032 \times 1.013 \times 1.026 \times 1.000 \times .990 = 1.063$$

In explanation:

1.032 is the experience indication with losses on the 1948 law level. Since the 1947 and 1948 law amendments amounted to 1.042 and 1.096 respectively, the pure experience change from 1946 (present) was

$$\frac{1.032}{1.042 \times 1.096} = .904, \text{ or a decrease of } 9.6\%.$$

1.013 is the Security Funds Factor.

1.026 is the effect of incorporating a profit provision of 1.5 points in the rate structure  $\frac{.600}{.600-.015} = 1.026$

1.000 is the adopted Rate Level Adjustment Factor.

.990 is the net effect of increasing the Workmen's Compensation Board Factor from 1.063 to 1.066, but loading it only for acquisition and taxes.

### 2. Average Expense Provisions

The following distribution of the average expense provisions results from the adoption of a profit provision of 1.5 points and the inclusion of the Workmen's Compensation Board Factor and Security Funds Factor in the rate structure: (See appendix #1)

	In Standard Rates (excl. Loss & Premium)	In Printed Manual Rates (excl. Loss & Expense Constants)
Acquisition . . . . .	17.5%	17.5%
Taxes . . . . .	2.5	2.5
Claim Adjustment . . . . .	7.6	7.7
Inspection . . . . .	2.4	2.4
H.O. Administration . . . . .	7.2	6.9
Payroll Audit . . . . .	1.9	1.6
Profit Provision . . . . .	1.4	1.4
Sub-total . . . . .	40.5	40.0
Security Funds . . . . .	1.0	1.0
Workmen's Compensation Assessment . . . . .	2.6*	2.6*
Loss Provision . . . . .	55.9	56.4
Total . . . . .	100.0	100.0

\*Actually applied as 4.8% of indemnity losses, with full loading thereon.

### 3. Loss and Expense Constants

Although there has been no basic change in the calculation of loss and expense constants and offsetting adjustment factors, the formulae have been simplified and, in order to produce stability, the loss ratio differential is now determined from ten years of experience. The formulae used in these calculations are given in the Appendix of this paper.

The following loss and expense constants and offsetting adjustment factors for loss constants and the off-balance of the Experience Rating Plan were adopted at the 1948 revision:

Industry Group	Loss Constant	Expense Constant	Offsetting Adjustment Factor
Manufacturing . . . . .	\$ 8	\$5	1.028
Contracting . . . . .	26	5	1.015
Federal . . . . .	26	5	1.000
Servants P.C. . . . .	0	5	1.000
Window Cleaning . . . . .	0	5	1.000
All Other . . . . .	8	5	1.016

Obviously, the expense constant is 100% for expenses. Question was raised as to how much the loss constants had been loaded for expenses. It was determined that the loss element in the loss constant had been loaded for all expenses except Administration and Payroll Audit by the application of a factor of .564 to the indicated loss constants on a full

$$\frac{.564 + .085}{.564 + .085}$$

premium basis. Thus 64.9% of the final loss constant is a loss element and 35.1% for expenses other than Administration and Payroll Audit.

$$.564 + .085 = .649$$

$$1.000 - .649 = .351$$

4. *Pure Premium Correction Factors*

It was determined that correction factors of .9721 for indemnity and .9774 for medical were necessary to be applied to the selected pure premiums in order to reproduce the desired rate level. These calculations, made under a revised procedure suggested by the Insurance Department, failed to include the effect of the premium development factor on the pure premiums, with the result that the factors, and the rates resulting therefrom, were too high by 0.2%. The product of these correction factors, the Workmen's Compensation Board factor on New York indemnity losses, the Security Funds factor, the expense loading and the offsetting adjustment factors determined above, produced the final factors which, applied to the selected pure premiums, resulted in the 7/1/48 printed manual rates (less the catastrophe loading):

	Indemnity	Medical
Manufacturing . . . . .	1.798	1.753
Contracting . . . . .	1.776	1.730
Federal { New York . . . . .	1.749	1.705
{ United States . . . . .	1.669	1.705
Servants P.C. . . . .	1.749	1.705
Code No. 9170 . . . . .	1.749	1.705
All Other . . . . .	1.778	1.732

For example,  $.9721 \times 1.028 \times 1.048 \times 1.695 \times 1.013 = 1.798$

- where .9721 is the indemnity pure premium correction factor
- 1.028 is the manufacturing offsetting adjustment factor
- 1.048 is the Workmen's Compensation Board factor
- 1.695 is the expense loading  $\frac{1.0}{.605 - .015}$
- 1.013 is the Security Funds factor



For Code #2501, the following pure premiums had been selected by the Classification & Rating Committee:

$$\begin{aligned} & \text{Serious } .06, \text{ Non-Serious } .16, \text{ Medical } .10. \\ & (.06 + .16)1.798 + (.10)1.753 + .01 = \$3.58 \\ & \text{which is the } 7/1/48 \text{ manual rate.} \end{aligned}$$

#### F. *Minimum Premium Formula*

The 1945 Report on Examination of the Compensation Insurance Rating Board cited above recommended modification of the minimum premium formula to recognize the favorable loss ratios of recent policy year experience.

The Subcommittee which had studied the subject of pure premium selection also undertook a thorough analysis of the minimum premium formula. It was early recognized that the permissible loss ratio for minimum premium risks should be lower than 60%, but no successful attempt to determine it exactly was made.

After studying this subject for more than a year, a majority report of the Subcommittee recommended no change in the present formula for the following reasons:

"1. Since approximately the same redundancy appears in the loss provision for both minimum premium and non-minimum premium risks under \$500, it is likely that the situation will be corrected by the 1948 rate level and calculation of revised loss and expense constants.

2. Even though the loss provision appears to be somewhat redundant, there is no evidence as to whether the expense provision in the minimum premium formula is adequate. Since the Insurance Department is now engaged in making a study of this element, the Committee felt justified in waiting to see whether the expense provision is adequate or inadequate."

Concurrently, a minority report, filed by a member of the Subcommittee, recommended changing the minimum premium formula to ten times the manual rate plus loss and expense constant. This report pointed out the lower formula in effect in most other states, and criticized the majority report for attempting to maintain the "status quo" in the face of evidence indicating that a reduction in the formula was justified.

The Actuarial Committee, a tie vote being broken by the General Manager of the Rating Board, voted to revise the minimum premium formula to ten times the manual rate plus loss and expense constant effective July 1, 1948. Subsequently, the Classification and Rating Committee took similar action with regard to the minimum payroll for Code #9021—"Buildings," thus effectively reducing the minimum premium for that classification.

#### G. *Outstanding Rate Increase*

Because of the magnitude of the 1948 law amendments, effective July 1, 1948, it was deemed advisable to request adjustment of the rates on outstanding policies. In accordance with the program of the National

Council on Compensation Insurance, an increase equal to the combination of experience and law amendment (and also including provision for the Security Funds factor, since payments into the Stock Security Fund had been required beginning July 1, 1947) was requested. This amounted to 4.6%. As an expedient, it was decided that such increase would not apply to policies expiring prior to August 1, 1948.

This outstanding increase was approved, concurrent with the approval of the general rate revision, on June 28, 1948.

#### IV. *Conclusion*

Any attempt to cover eight years of progress in a field as large as this is bound to lead to omissions—some intentional and some unintentional. If the members and students of the Society are able to get a general picture of the developments that have taken place and the trend of current thinking, this effort will not have been in vain.

APPENDIX 1  
 WORKMEN'S COMPENSATION - N. Y.  
 CALCULATION OF STANDARD PREMIUM EXPENSE DISTRIBUTION

*July 1, 1948 Revision*

based on original premium of \$1,000,000

NEW YORK COMPENSATION RATE MAKING

Item (1)	Basic Loading (2)	(2) × 1,000,000 (3)	Security Fds Factor (a) (4)	W. C. Bd. Assessment (b) (5)	Total (3) + (4) + (5) (6)	Ratio to Total (7)
Acquisition	17.5%	175,000	2,215	6,091	183,306	17.5
Taxes	2.5	25,000	316	870	26,186	2.5
Claim Adjustment	8.0	80,000	—	—	80,000	7.6
Inspection	2.5	25,000	—	—	25,000	2.4
H. O. Administration	7.5	75,000	—	—	75,000	7.2
Payroll Audit	2.0	20,000	—	—	20,000	1.9
Profit Provision	1.5	15,000	—	—	15,000	1.4
Sub-total	41.5	415,000	2,531	6,961	424,492	40.5
Security Funds Tax	—	—	10,127	348	10,475	1.0
W. C. Bd. Assessment	—	—	—	27,495	27,495	2.6
Loss Provision	58.5	585,000	—	—	585,000	55.9
Total	100.0	1,000,000	12,658	34,804	1,047,462	100.0

(a) 
$$\frac{.01 \times 1,000,000}{1.00 - (.175 + .035)} = 12,658$$

(b) W.C. Board factor of 6.6% of indemnity losses equals 4.7% of total losses.

$$\frac{.047 \times 585,000}{1.00 - (.175 + .035)} = 34,804$$

## APPENDIX 2

CALCULATION OF LOSS AND EXPENSE CONSTANTS AND OF  
OFFSETTING ADJUSTMENT FACTORS

$P_1$  – Full Premium at proposed rates – risks under \$500.

$P_2$  – Full Premium at proposed rates – risks over \$500.

$D_3$  – Adopted loss ratio differential for risks under \$500 vs. risks over \$500.

$$e = \frac{P_1 + P_2}{P_1 D_3 + P_2}$$

$a$  – offsetting adjustment in present rates.

$z$  – average credibility in experience rating.

$b$  – credit off-balance in experience rating.

$b_1$  – estimated credit off-balance eliminating effect of offsetting adjustment factor.

$$z(1-a) + ab$$

$k$  – proportion of premium for risks over \$500 subject to experience rating.

$a_2$  – indicated offsetting adjustment factor for revised rates.

$$\frac{e + kb_1 - kz}{1 - kz}$$

$b_2$  – expected credit off-balance for rated risks at revised rates.

$$z - (z-b)a/a_2$$

$N_1$  – number of risks under \$500.

$L$  – indicated loss constant.

$$\frac{.869 (1-e)P_2 + (1-a_2)P_1}{N_1}$$

$C$  – indicated loss and expense constant –  $L + \$5$ .

*Sources – at 1948 Rate Revision*

$P_1$  and  $P_2$  – policy year 1945 payrolls extended at selected pure premiums and adjusted to the adopted rate level and including the full expense loading.

$D_3$  – experience of policy years 1936-45.

$z$  and  $b$  – July 1, 1947 – June 30, 1948 experience rating statistics.

$k$  – special tabulation of policy year 1945.

$N_1$  – policy year 1945 risks experience.