INTERSTATE AND OVERALL RATING PLANS

BY

SEYMOUR E. SMITH

The National Council on Compensation Insurance has recently adopted two rather extensive modifications to the existing rating plans for workmen's compensation insurance. The first is the extension of the experience rating plan from an intra-state to an interstate basis. The second provides for the optional combination for retrospective rating purposes of workmen's compensation and other third party liability lines. This extension of the retrospective rating plan further provides that the rating values are not fixed in tabular form as in the current retrospective procedure, but may be selected by the assured and the carrier in accordance with the rules established for the plan. It is the intent of this paper to outline the reasons for these modifications and the procedures that will be involved in their application.

Interstate experience rating is nothing new in the field of workmen's compensation insurance, having been in use in an appreciable number of states prior to its discontinuance in July of 1932. At that time the principle of interstate rating was still advocated by the majority of the carriers, but there were several practical difficulties which appreciably reduced the effectiveness of its application and made such discontinuance advisable. The first difficulty was the limited number of jurisdictions to which the plan applied. Several of the large industrial states would not permit interstate rating, and insisted upon their own individual intra-state plans. This not only reduced the number of risks which were eligible for interstate rating but also drastically curtailed the effectiveness of the plan for many risks which did qualify. A second difficulty was the highly complicated procedure involved. An average modification for the risk was first calculated using the combined experience for all states. This average modification applied in each state where the risk did not qualify for rating on an intra-state basis. For states where the risk did qualify for rating the state modification was calculated and then multiplied by an "F" factor. This "F" factor was the ratio of the total adjusted loss, obtained by applying the average modification to the total expected losses for qualifying states, to the sum of the intra-state adjusted losses for these states. This was a complicated and laborious procedure at best, and under the statistical procedures in effect at that time the plan involved a burden and expense upon the business that did not seem to be justified by the results obtained. In addition, the overall need for an interstate experience rating plan was materially lessened by the fact that in 1932 there were thirteen states in which workmen's compensation rates were not subject to regulation. If the intra-state rating procedure did not develop proper results for a risk with multi

state operations the premium in the unregulated states could be adjusted to produce the required overall results. This was, of course, not the most desirable method, but it did serve a highly practical purpose in developing satisfactory rates for interstate risks. Thus, although interstate rating was abandoned as a formalized rating plan, it was still carried on informally for a large proportion of interstate risks.

The theory of experience rating is that the degree to which a risk is better or worse than the average of all risks of the same class shall be measured by the experience of the past. The actual losses for the experience period are compared with the losses contemplated by the manual, or average, rates. The difference between the actual and expected losses is tempered by the amount of credence that can be given to the actual experience, and as the risk increases in size a greater amount of reliability can be placed upon its own losses. If an interstate risk is broken up into segments and the operations in each state are rated separately the resulting decrease in credibility may very well result in modified rates which will produce an over-all premium for the risk which is palpably too high or too low. There is the additional problem, quite frequent among contracting risks, of the assured who expands his operations to an additional state. Under an intra-state plan this risk must be written at manual rates in the new state regardless of how good or how bad his experience record has been for similar operations in other states. Since within a very short time rate regulation will be in effect for almost all casualty lines in all but a very few states, it will no longer be possible to arrive at a proper over-all rate for the individual risk by adjusting the rates for those jurisdictions or lines of insurance which are not subject to supervision. The National Council on Compensation Insurance recognized that this change in the rate regulatory picture plus the new legal concept of insurance as interstate commerce presented a very real and practical problem in developing proper rates for interstate risks which would only be solved satisfactorily by the adoption of an interstate experience rating program.

There have been two developments during the intervening years since the old interstate experience rating plan was discontinued which will make for a far less cumbersome and complicated procedure. The first is the Unit Statistical Plan which was adopted by the National Council in 1934 and which is now in use in practically every state. This plan for the compilation of basic statistics furnishes the individual experience record of every risk in the state, thus eliminating the need for the separate experience rating reports required by the procedure in effect in 1932. The second development is the multi-split experience rating procedure which was introduced in 1940 and which is now in effect in all except a very few states whose independent rating bureaus are renowned for their rugged individualism. The multi-split plan is much more

simple in operation than the old experience rating plan and is readily adaptable to combination between states.

The new interstate experience rating plan was filed to become effective October 1, 1947, and at the time of this writing is now effective in 21 states, and pending in all but a few states. For those states in which it is in effect the plan provides that any risk which qualified for experience rating in any one state on an intra-state basis shall be eligible for interstate rating and shall be rated upon the experience of all states combined for which the plan has been approved. The initial step in the rating procedure is the filing by the carrier of the Notification of Coverage form, which lists each state in which the risk operates and the risk name and policy number for each state. This form is necessary since the present Unit Reports for the individual states do not show whether or not the risk operates in other jurisdictions. The information required for this Notification of Coverage form is readily available to the carrier from its payroll audit records. When the National Council received the list of states from the carrier the Unit Report cards are drawn for the risk and the actual and expected primary and excess losses for each state are entered on the present experience rating form. The rating forms for each state are placed together and the totals for each state are posted on the Summary Sheet for Interstate Risks shown as Exhibit A attached. This summary sheet is the form on which the interstate experience modification is calculated. The rating formula is the same as that in the intra-state multi-split plan as follows:

$$M = \frac{Ap + B + WAe}{Ep + B + WEe}$$

The actual and expected primary and excess losses are the totals for all states combined. The "B" value is the weighted average of the "B" values for each state based upon the total expected losses for all states combined. The "W" factor is similarly the weighted average of the "W" factors for each state based upon the total expected losses for all states combined. The weights used are the expected losses for each state.

The experience modification determined by the above procedure applies in all states in which interstate experience rating is effective, thus eliminating the cumbersome procedure under the old interstate plan under which the modification was adjusted for each state developing a qualifying volume of experience. The use of a single modification for all states follows the concept of considering the risk in its entirety. Under the intra-state plan if a risk's operations are carried on at several different locations within the state the risk is rated as a whole and no attempt is made to develop a separate modification for each individual location. Under an interstate procedure the same treatment was consid-

ered to be the most desirable, since no practical advantages accrue from measuring the experience as segregated by state boundaries. If the distribution of the risk's operations by state is relatively static the development of a separate modification for each state under an interstate plan will have no effect upon the over-all premium for the risk, and an unnecessary amount of labor and expense will be incurred. If the distribution of operations by state is subject to appreciable fluctuation the use of separate modifications by state may produce very undesirable results. Individual state modifications would have to be adjusted to produce the over-all interstate modification for the risk and the adjustment factor might be very substantial for a risk with operations spread out over many states. If operations were greatly expanded in a state where a small volume of experience had produced abnormally favorable or unfavorable results, the effect of a substantial adjustment factor could produce rates that would be unreasonably low or high for the risk.

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Before going into the actual procedures involved it seems desirable to outline the reasons why the National Council on Compensation Insurance has adopted the extension of the retrospective rating procedure to provide for the optional combination for rating purposes on an interstate basis of workmen's compensation with other third party liability lines, and also why the procedure was further extended to provide that the retrospective rating values should not be established in tabular form but may be selected by the assured and the carrier in accordance with the rules established. As in the case of interstate experience rating, the recent changes in the casualty rate regulatory picture have raised a very practical problem in the rating of large risks. Ever since the introduction of retrospective rating in 1936 this type of plan has been applied to a steadily increasing number of risks. During the early years of the plan many carriers experimented with writing all third party liability lines including compensation under a single over-all retrospective plan. Since automobile and other liability rates were unregulated in most states, the premium for these lines was an amount which when added to the approved compensation premium produced the premium developed by the over-all retrospective agreement. It was found that this type of plan was exceedingly successful in its operation, and it became increasingly popular with both carriers and assureds as it demonstrated its ability to produce a final premium which came far closer towards meeting the actual needs of the individual risk than any casualty rating plan that had yet been developed. This type of plan was given a further impetus by The Comprehensive Rating Plan for National Defense Projects which was developed by the United States

Government just prior to our entry into the war. This was a retrospective plan which combined workmen's compensation and other third party liability lines for rating purposes. The reason for the successful operation of this type of plan is that it brings the advantages of multiple line underwriting down to the individual risk level. Although each line of insurance must receive separate consideration in all of its various aspects both the insurance buyer and the underwriter are primarily concerned with whether or not the total premium for all third party liability lines properly reflects the over-all experience and hazards of the risk. No matter how carefully rates and rating plans are developed for any one line of casualty insurance the resulting rates will be too high for some risks and too low for others. When several lines are combined in rating the individual risk the chance for their over-all accuracy is greatly enhanced, since any inequity developed in any one line will tend to be offset in another line.

At the present time over-all retrospective rating has passed beyond the experimental stage and has become an integral part in the rating of large casualty risks throughout the country. Since rate regulation will soon become effective for all third party liability lines in almost every state it became necessary to develop a formal over-all retrospective plan within the framework of legislative enactment to avoid a serious disruption of the casualty insurance market that would be harmful to assureds and carriers alike.

In considering the development of such a plan recognition was given to the criticism that the current retrospective plan tabular minimum and maximum premium ratios were too rigid. Under the current compensation retrospective plans A, B and C which are in effect in a large number of states a particular sized risk may select Plan A in which the standard premium is the maximum or Plans B or C with comparatively high maximum ratios for all but the exceedingly large risks. There are many risks which prefer the retrospective type plan and are willing to assume a penalty for poor experience in return for a reward for good experience, but for which the present choices are not appropriate in that the possible saving under Plan A is not attractive enough and the Plan B or Plan C maximum is higher than the risk is able to assume. To solve this situation it was decided that a formula type plan should be adopted under which there would be an unlimited choice of maximum and minimum ratios. The values most appropriate for the risk could then be selected by the carrier and the assured and the proper insurance charge determined.

Retrospective Rating - Plan D is the name given to the over-all retrospective rating plan which has been developed by the National Council on Compensation Insurance. It is an interstate plan which provides for the optional combination for rating purposes of workmen's compensation with other third party liability lines. It will be filed only in those states and for those lines of insurance in

such states for which rates and action in concert with respect thereto are subject to state regulation. The qualification point is $5,000 of annual standard premium for all lines combined subject to the plan. For lines other than workmen's compensation the plan does not apply to premiums or losses for coverage in excess of a limit of $10,000 per accident exclusive of allocated claim expense. The over-all minimum and maximum premium ratios for the risk are selected in advance by the assured and the carrier and the appropriate basic premium ratios are calculated separately for workmen's compensation and for other third party lines. The rules of the plan provide that rating values shall be calculated upon the basis of 50%, 100% and 150% of the total estimated annual standard premium. If desired, rating values may also be calculated for premium sizes below 50% and above 150% of the estimated annual premium. A table of the calculated rating values shall be made a part of the retrospective endorsement, and if the final total audited standard premium for the risk falls between any two of the amounts shown in the table the final rating values for the risk shall be obtained by straight line interpolation between the corresponding tabular values. The loss conversion factor may also be selected by the assured and the carrier, but shall not be greater than 1.13 for stock carriers or 1.30 for non-stock carriers.

In developing the rating values for this plan the first problem for consideration was the determination of proper insurance charges - that is the charge for losses in excess of the maximum premium less the expected saving on the minimum premium. There was available the current table of compensation excess pure premium ratios which underlies the present compensation retrospective plans, but this table is on a standard premium basis. Since several lines of insurance with different permissible loss ratios are involved in Plan D the table could not be used in its present form. Therefore "Table M" was evolved, which is the current table of excess pure premium ratios converted from a premium to an expected loss basis. As a measure of the dispersion of losses about the expected it may be used for any expected loss ratio. The next problem was whether this table, which was developed from compensation experience, could be used for other third party liability lines. Since unit reports are not available for automobile and other liability insurance, an exact check could not be made. However, the Actuarial Committee of the National Council reviewed the table and was of the opinion that it would produce satisfactory results for these lines when applied to expected losses for coverage within a $10,000 accident limitation. In view of the relationship of average claim costs between compensation and other third party liability lines this seems to be a reasonable conclusion. The average compensation claim cost (indemnity and medical combined and including non-compensable medical cases) for the first six months of policy year 1945, as compiled by the New York Compensation Insurance

Rating Board in June of 1947 amounted to $162. Compared with this the average incurred claim cost for one large carrier for the first nine months of calendar year 1947 for automobile and other liability and property damage combined was $151 based upon an incurred loss volume in excess of $21,000,000.

To determine the insurance charge for a particular risk the expected losses are determined separately for workmen's compensation and for other third party liability lines. For compensation the total expected losses are determined by multiplying the estimated annual standard premium for each state by the appropriate factor taken from the Table of Workmen's Compensation Expected Loss Ratios promulgated by the National Council. These expected loss ratios are those underlying the approved rates in each state. For lines other than compensation the expected losses are those contained in the carrier's approved filing for each state involved. When the total expected losses have been determined the "Table M" values are obtained for the selected maximum and minimum loss ratios based upon the total risk expected loss size. The net insurance charge is determined separately for compensation and other lines by multiplying the product of the expected lossed for the line and the "Table M" values by the loss conversion factor. When the net insurance charge has been determined it remains to add the proper expense costs to obtain the basic premiums for the risk. For workmen's compensation the total provision for expenses other than taxes is 17.5% of the expected losses representing claim, inspection and bureau expense plus the following percentages of the standard premium for acquisition, administration and audit:

For Stock Companies	For Non-Stock Companies
27.0% of first $1,000	27.0% of first $1,000
16.6 of next 4,000	22.1 of next 4,000
11.6 " " 95,000	19.2 all over 5,000
10.1 all over 100,000	

The non-stock carriers will use the above expense provisions in lieu of the Non-Stock Adjustment Factors applicable for Plans A, B and C. The provision for claim, inspection and bureau expense is taken as 17.5% of the expected losses so that a uniform percentage could be used for states with and without expense constants. The standard provisions are as follows:

	Expense Constant States	Non-Expense Constant States
Claim	8.3%	8.0%
Inspection & Bureau	2.6%	2.5%
	10.9%	10.5%
Expected Losses	62.5%	60.0%
17.5% Expected Losses	10.9%	10.5%

The stock company provisions for acquisition, administration and audit shown in the above gradation are the standard provisions in National Council states except for the first $1,000, where they are the standard provisions in the non-expense constant states only. For the expense constant states the standard provision in the first $1,000 is 24.1% instead of the 27.0% shown in the table. As a practical matter it was decided to avoid the use of two separate tables for National Council states since the difference between 27.0% and 24.1% applies to only the first $1,000 of standard premium and makes a maximum difference of $29 on risks which must be $5,000 or over. Thus the maximum difference is 0.6% for a minimum sized risk, which reduces to less than 0.1% at the $30,000 standard premium size. This difference is so small that it does not justify the use of a separate table and may very well be considered as part of the contingency loading. In addition to the above compensation expense provisions there shall be a contingency loading of 1%, which conforms to the present retrospective rating procedure.

The above expense provisions, less the provision for expenses in the loss conversion factor, shall be added to the net insurance charge to obtain the compensation basic premium. The expense provision in the loss conversion factor is the factor minus unity multiplied by the expected losses. For example, if the loss conversion factor is 1.13 and the expected loss ratio is 62.5%, the expense provision in the loss conversion factor is 8.1% of standard premium.

$$(1.13-1.0) \times .625 = .081$$

It is permissible to round the basic premium determined above providing that such rounding does not reduce the contingency factor to less than 0.5%. For lines other than workmen's compensation the expense provisions shall be in accordance with the carrier's approved filings for the states involved. It is provided, however, that the total provision for contingencies and expenses other than taxes for these lines shall not be less than 15% of the standard premium plus 13% of the expected losses for such lines. The reason for this provision is to make sure that the compensation premium can not be adversely affected by any changes in the distribution by line of insurance between the estimated and the final audited standard premium. If the liability expense allowance were permitted to be less than the above provision, the over-all maximum and minimum premiums would be lower than those contemplated by the insurance charges if the final audited liability standard premium should be a smaller percentage of the total than in the estimated. This would of course have an adverse effect upon the workmen's compensation insurance charges. To eliminate this possibility the minimum liability expense and contingency provision, excluding tax, was

established as above. This is the same expense provisions as would be provided for workmen's compensation premium in excess of $5,000. This is shown in the following exhibit.

	Expense Constant State	Non-Expense Constant State
Compensation Claim, Inspection & Bureau	10.9%	10.5%
Compensation Acquisition, Admin. & Audit	11.6	11.6
Compensation Minimum Contingency Factor	0.5	0.5
	23.0	22.6
Less 13% of Expected Losses	-8.1	-7.8
	14.9	14.8

The above figures of 14.9% and 14.8% were rounded to 15%.

For risks involving ex-medical workmen's compensation coverage, the Plan D rating values are calculated by using the ex-medical standard premium. The compensation basic premium ratio determined in this manner is then multiplied by the ratio of the full medical standard premium to the ex-medical standard premium. The increased basic premium ratio is then applied to the ex-medical standard premium in rating the risk. This is the same procedure as is currently applied to retrospective Plans A, B and C.

The determination of the final retrospective premium under Plan D is in accordance with the following formula.

Retrospective Premium = [Basic Premium + (Losses x Loss Conversion Factor)] x tax multiplier.
(Subject to minimum and maximum premiums)

The premium for each state and line of insurance is allocated on the basis of its own indications. For each state, separately for each line of insurance, the standard premium times the basic premium ratio is added to the actual converted losses and the sum multiplied by the appropriate tax multiplier. If the total retrospective indicated premium for the risk is over the maximum the indicated premium for each state and line of insurance is multiplied by the ratio of the over-all maximum to the over-all indicated premium. A similar procedure is followed if the total indicated retrospective premium is under the minimum.

It will be recalled that the rating values to be applied to the final audited standard premium are taken from the table of rating values contained in the retrospective rating endorsement. The values in this table are calculated for 50%, 100% and 150% of the estimated annual standard premium, and if the final audited standard premium falls between any two of the premium sizes in the

table the rating values shall be obtained by using straight line interpolation between the tabular values shown. Tests have been made to determine the propriety of this interpolation procedure, and in every case the result is to provide a small additional safety margin in the insurance charge while maintaining the proper expense provisions. This result has been confirmed by a large number of similar tests made by the Connecticut Insurance Department. An example of the safety margins may be shown for a compensation risk with an estimated annual standard premium of $25,000 and expected losses of $15,000. If a maximum premium ratio of 126% and a minimum premium ratio of 56% are selected for the risk the appropriate basic premium ratios are 20.6% for the $25,000 premium size and 28.2% for the $12,500 premium size, with a loss conversion factor of 1.13. The basic premium ratios obtained by interpolation for the $15,000 and $20,000 premium sizes respectively are 26.7% and 23.6%. These interpolated basic premium ratios contain a safety margin of 0.6% and 0.9% respectively over what would be provided by the actual basic premium ratios calculated for these premium sizes.

It is believed by the proponents of Retrospective Rating - Plan D that the plan is actuarially sound and will represent a desirable step forward in the rating of sizeable casualty risks. The plan has been so designed as to provide ample safeguards and safety margins so that the integrity of the workmen's compensation rating procedure will in no way be endangered by the combination for rating purposes of workmen's compensation and other third party liability lines.

EXPERIENCE RATING FORM- SUMMARY SHEET FOR INTERSTATE RISKS

EXHIBIT A

Name of Risk ______________________________ Effective Date ____________

(1)	(2) Total Expected Losses by State	(3)	(4) Rating Values (Based on Item 2a)	(5)	(6) Excess Losses	(7)	(8) Primary Losses	(9)
State	Post Item (d) ERM-1 or 2	Ratio of Item (2) to Total (2a)	"W"	"B"	Actual Post Item (c) ERM-1 or 2	Expected Post Item (f) ERM-1 *	Actual Post Item (b) ERM-1 or 2	Expected Post Item (e) ERM-1 or 2
Total or Average	(a)	1.000	(b)	(c)	(d)	(e)		

(10) Average "B" Value	Item (5c)	Item (5c)
(11) Ratable Excess	(4b) x (6d)	(4b) x (7e)
(12) Totals	(f)	(g)
(13) Experience Mod. (f) ÷ (g) ________	Charge %	Credit %

Notes

(4b) = Sum of [(3) x (4)]

(5c) = Sum of [(3) x (5)]

* For ratings involving ex-medical exposure Post in Column (7) Item (g) form ERM-2

Adjusted rates resulting from this modification shall be subject to the approval of the Bureaus having jurisdiction.

ERM-7