

THE NEW YORK UNIT STATISTICAL PLAN; A METHOD
OF PREPARING AND REPORTING DATA AND
ANALYZING THE CARRIER'S BUSINESS

BY

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PART I

INTRODUCTION

The principles underlying the New York Unit Statistical Plan are neither new nor radical. The essential features of the Plan have been in use in the state of Pennsylvania for some time, and at the present time similar plans are in operation in the states of Massachusetts, Virginia, North Carolina and Georgia.

For several years, workmen's compensation rating procedure in New York has been the subject of criticism, particularly so because of the disparity between premiums collected by the insurance carriers and premiums anticipated by the manual rate structure. The New York Plan is essentially the development of several years of attempts to improve the existing plans of manual rate making, individual risk merit rating and statistical reporting.

In 1925 and 1926, the Compensation Insurance Rating Board (then the Compensation Inspection Rating Board) made a detailed investigation in the offices of the various carriers writing workmen's compensation business to ascertain (1) the degree to which the Board's manual rules and underwriting practices were observed, (2) the accuracy of the carriers' preparation of Schedule Z and (3) the accuracy of the carriers' compilation of data for individual risk merit rating.

At the request of the Governing Committee of the Rating Board, the Actuarial Committee considered methods of correcting the deficit in collected premiums due to the application of the schedule and experience rating plans.

The Committee, at its meeting of April 8, 1926, recorded itself as opposed to an extensive investigation, on the grounds of the time and expense involved and the uncertainty of the results. The point was made that the recent investigation conducted by the Board would undoubtedly improve conditions, and further observation of the probable causes of the deficit was advised.

The Governing Committee evidently was not satisfied, however, for on March 31, 1927, it directed the Actuarial Committee to make a general investigation and report back to it with a plan designed to improve the value of the data submitted for experience rating and manual rate making purposes.

The Actuarial Committee considered the defects of the then existing plans, especially as revealed by the Board's investigation into the underwriting practices of its member carriers, and endeavored to find a means of checking the data submitted by the carriers without changing the basic methods of reporting.

After lengthy consideration, the Committee recommended that the statistical work and program of the Board be extended to include the following:

1. The filing of an individual accident report on every case costing \$500. or more in incurred indemnity losses.
2. The filing of copies of all audit bills or abstracts thereof on all risks subject to experience rating.
3. Periodical comparisons of individual reports submitted for experience rating and in Schedule Z.
4. A special call for experience on policy years 1924 and 1925, to be sent to all carriers, requiring the submission of data showing, by industrial groups, size of risk and policy year, the number of policies, premium, number of compensable accidents, incurred losses and loss ratios.

The Conference Committee on revision of the workmen's compensation rate making formulae, which was appointed by the Superintendent of Insurance on September 22, 1927, to consider changes in the method of rating workmen's compensation business, submitted the following resolution in its report:

“Resolved, that the Committee incorporate in its report to the Superintendent of Insurance a recommendation to the effect that the proposed recognition of the differentiation between large and small risks indicated by the available data will require the adoption of a different statistical program designed to afford detailed information on the subject. Further, that the Committee is of the opinion that a system which will automatically furnish the necessary data as a part of the report of data for classification purposes is desirable. In this connection, the Committee favors a sys-

tem under which unit information will be reported either in the form of a unit report of each claim and audit, or in the form of an individual risk Schedule Z. Such a system would permit the New York Board to compile individual risk experience for experience rating purposes as well as to ascertain appropriate differentials between large and small risks by whatever subdivision of industry such detailed data might show to be necessary. The Committee is not recommending the precise details of such a statistical plan, as it believes that the details should be developed by the Actuarial Committee of the Board after much more thorough consideration of all the practical points than it has been possible for this Committee to give. Any such detailed statistical plan would presumably carry with it provision for filing of applications on all risks with the Board. Such filings would be important both for the auditing of the statistical data and the verification of the correct application of the policy fees proposed by the Committee."

This action by the Conference Committee marked the first definite step toward the adoption of the New York Unit Statistical Plan which is now in use.

The matter of preparing the details of the Unit Statistical Plan was referred to the Actuarial Committee of the Board and prolonged discussion developed two separate proposals as to the basic structure of the plan. One group in the Committee favored a plan which would involve the submission of individual reports on each claim incurred by every carrier and corresponding reports of every audit made. Another group favored a plan in which the unit of report would be the risk rather than the claim and the audit.

As it appeared impossible to harmonize the two viewpoints, the two groups were directed to formulate separate plans and file them with the Superintendent of Insurance, who would make the decision.

The two plans were duly filed and, at the request of the Insurance Department, the Staff of the Board also submitted an outline of a statistical plan which it believed would serve the same purpose as the plans submitted by the two groups.

The Board's so-called "modified plan" was selected by the Superintendent of Insurance for approval "as being the most suitable at the outset for the purpose for which it has been designed."

Briefly, this plan provides for the following:

- (1) The filing of copies of the declarations on each workmen's compensation policy issued in New York State except in cases where the policy is returned "not taken" or is cancelled flat prior to its submittal to the Board. In the case of carriers using an index card containing the same information shown on the declaration, a copy of such index card should be filed in lieu of the declaration, provided its form and content prove acceptable to the Board. When any policy for which copy of declaration or index card has been filed with the Board is cancelled for any reason, a notice of cancellation must be submitted to the Board.
- (2) An exposure card showing audited payroll, rates, and earned premium by classification, and, where necessary, by location, on every policy, to be filed six months after its expiration date.
- (3) A loss card to be filed concurrently with the exposure card giving a list of all compensable claims showing claim numbers, classification code number, incurred cost (both compensation and medical), class of injury, date of accident and whether open or closed case; also giving the amount of non-compensable medical analyzed by classification.
- (4) Individual accident reports (such as have been required in Schedule Z) on all death, permanent total and open cases. Such reports are not required on any closed major, minor or temporary cases.
- (5) Revalued reports on death, permanent total, open and reopened cases to be filed eighteen, thirty and forty-two months, respectively, after expiration of policy.

It is not within the scope of this paper to quote in detail the requirements of the present Unit Statistical Plan. These requirements have been outlined completely in statistical circulars Nos. 1 to 17 issued by the Board between June 13, 1928 and the present time. The basic plan was issued in printed form on June 1, 1930 and detailed instructions for the preparation and filing of data will be found fully outlined therein.

The two main purposes of this paper are to outline first, the method adopted by the carrier with which the writer is connected to meet the requirements of the Plan, and second, the additional analysis work carried on to furnish the management of the carrier with statistics designed to facilitate the analysis and control of its business.

PART II

OPERATION OF THE PLAN IN THE OFFICES OF THE CARRIER

In accordance with the provisions of the New York Unit Statistical Plan, the underwriting department files with the Rating Board a copy of its policy declaration on all new business and a copy of its renewal endorsement on all renewal business. In this connection, it should be borne in mind that this carrier does not issue a new policy for each policy or fiscal year. Its special policy contract contains an automatic renewal clause providing that the insurance automatically renews itself for a period of one year on expiration unless the policyholder has signified his intention to cancel at least thirty days prior to the expiration date of his policy. A renewal endorsement is issued promulgating the rates to apply to the contract for the second year and again for succeeding policy or fiscal years. In order to ensure the filing of all data required with the Board, the underwriting department makes it a practice to file not only the declarations, renewal endorsements and cancellation notices but also copies of all endorsements which are issued. In addition, copies of all binders issued on which a policy is not subsequently issued are submitted to the Board with the notation "no policy issued" stamped thereon. Where a policy is issued to supersede a binder, the declaration is filed.

EXPIRATION FILE

The data required under the Plan are, of course, filed by the actuarial department. In order to start the routine of preparing the experience cards at the proper valuation date, i.e., eighteen months after policy inception or anniversary date, it was necessary to create an expiration file. As the underwriting depart-

ment already prepared addressograph stencils showing the name and address of the assured, the policy number and the month and day of expiration for each policy as soon as issued, it was decided that these stencils could be utilized to run 3" x 5" cards which would be furnished to the actuarial department by months of issue, in policy number order. It was necessary to recognize changes in policy dates, by requiring the addressograph operator to prepare special cards on all policies where the inception date differed from the expiration date. It was further necessary to defer the sending of the cards to the actuarial department for approximately two months after the month of issue, so that all policies chargeable to the month of issue being prepared, which were recorded on new business lists subsequent to the corresponding calendar month, would be included in the month's expiration cards. Cancellations recorded during this two months' period were included in with the active expiration cards, so that all policies effective or renewed during the month of issue under consideration, would be represented by an expiration card. It will be evident that some of the cards so included represent flat cancellations, but it was thought better to have a few unnecessary cards rather than to risk the omission of numerous cards on cancelled policies. If a policy chargeable to a given month of issue is recorded on the new business lists after the expiration cards for that month have been sent to the actuarial department, a special expiration card is prepared and sent at once. These cards are filed in with the regular cards by the actuarial department.

ADJUSTMENT BILL FILE

Whenever an adjustment bill showing actual payroll and earned premium based on payroll audit or report is prepared by the accounting department, a special copy captioned "Rating Board Copy" is sent to the actuarial department (see Exhibit 1). These bills, which have been coded to show the month and year of issue of the policy to which they apply, are sorted and filed in order by policy number within month and year of issue, no separation being made between active and cancelled policies. Bills covering interim audit terms are clipped together so that they may be summarized at the time the experience is being prepared.

EXHIBIT 1

STATE INSURANCE FUND
ADMINISTERED BY THE INDUSTRIAL COMMISSIONER
432 FOURTH AVENUE, NEW YORK

		DATE	(NEW)	(RENEWAL)
		POLICY NO.	(MONTH)	(YEAR OF ISSUE)
		GROUP	(DISTRICT)	(SOLICITOR)
		(RATING BOARD COPY)		

DETACH THIS COUPON AND RETURN WITH YOUR REMITTANCE.
 PLEASE MAKE REMITTANCE PAYABLE TO: STATE INSURANCE FUND

Earned premium computed on payroll.....for period fromto.....

POLICY NO.....	PAYROLL CLASSIFICATION	ACTUAL PAYROLL	RATE PER \$100 OF PAYROLL	EARNED PREMIUM
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Total earned premium for above period.....\$

Less deposit premium heretofore billed.....

Balance.....\$

Deduction.....

Amount.....owe on this bill.....\$

In addition to this bill you are.....with items previously billed.....

You now owe us \$.....

Bill No. A.....

EXPOSURE TOTALING AND POSTING

Seventeen months after the beginning of any month of issue, for instance, June 1, 1929 for policies effective in January, 1928, the audit bills in file for the particular month of issue are inspected by a clerk who checks the month and year of issue to see that the bills were properly filed, and checks the dates covered by the bill or bills to see that a complete policy year has been covered. If a complete year is not covered by the bills at hand, the claim coverage file (which is located in the actuarial department) is consulted to ascertain if the short term is due to a change in policy date. If it is not, the bills are placed in a special folder and accumulated until the entire month's bills have been examined. Bills covering wrecking or building demolition work and contracting business operating at more than one location are also placed in the special folder. Billing folders are then pulled for all policies on which bills have been placed in the special folder, so that the complete exposure for the policy period may be ascertained.

In all cases where the policy term is covered by more than one bill, but where all bills are available, such bills are turned over to a comptometer operator for the totaling of payrolls and premiums by classification, separating all items within one classification where there has been a change of rate within the policy term. The operator totals these items and places the results on a small slip which she attaches to the bills showing (1) classification number, (2) total payroll exposed, (3) rate actually charged, (4) earned premium. The loss and expense constants are shown separately and also the total earned premium including the loss and expense constants. After this totaling has been completed for all interim audit policies on which complete audits have been made, expiration cards are drawn from the expiration file and matched with the audit bills. There will usually be a considerable number of expiration cards left after all bills have been disposed of. These will represent either (a) flat cancellations, (b) unaudited policies, (c) misfiled expiration cards or (d) misfiled audit bills. Clerks then check the expiration cards against the claim coverage file, in which an index card is kept for every policy, to eliminate the flat cancellations. The remainder of the expiration cards are listed on a special form (see Exhibit 2)

The exposure side of the experience card (Exhibit 3a) is then prepared. If any discrepancy is noted in the name or address of the assured as given on the expiration card and the bill, the case is checked with the coverage files and, if necessary, with the general files in the underwriting department to insure the correctness of the name and address of the assured. On cancelled policies the word "cancelled" and the cancellation date are noted on the face of the experience card. Nominal changes of interest in ownership and/or control of a risk are combined on one experience card, while material changes of interest are recorded on two separate cards which are clipped together when they are submitted to the Board. Special conditions affecting coverage such as ex-medical, hospital allowance, medical contract or coverage subject to the State Employees' Retirement System are marked on the card in the appropriate place. The classification code numbers, classification wording, rates charged and earned premium are then entered in the appropriate columns on the experience card. On minimum premium risks the excess of the total minimum premium, excluding the loss and expense constant over the actual earned premium produced by extending the audited payrolls at the rates applicable, is entered on the line opposite the governing classification of the risk. This premium bears the symbol M. P. (Minimum Premium). In all cases in which minimum premiums are charged, such premium is shown separated as between the loss and expense constant and payroll portions of the minimum premium.

LOSS VALUATION

When the exposure side of the experience card has been properly filled out, clerks pull the employer's experience card (see Exhibit 4), which is prepared on all policies on which losses have been incurred, from the employer's card files for the preparation of the loss side of the card (see Exhibit 3b).

EXHIBIT 6

ACT. DEPT. COPY

ACCIDENT REPORT

ACT. DEPT. COPY

GASE NUMBER

GROUP

DATE

1. CLASS		2. EMPLOYER				3. STREET AND NUMBER		4. CITY OR TOWN	
5. AMOUNT PAID		6. INJURED PERSON				7. STREET AND NUMBER		8. CITY OR TOWN	
9. POLICY NUMBER		10. No. of Ins. Issd.		11. BUSINESS		12. PLACE OF ACCIDENT		13. FOREMAN	
14. HOUR OF ACCIDENT		15. SEX	16. AGE	17. REGULAR OCCUPATION		18. UNL. IN RES. OCC.		19. OCCUPATION WHEN INJURED	
20. TIME PAID		21. WAGES	22. TIME BASIS	23. DAYS PER WEEK	24. OTHER ADVANTAGES		25. LOSS OF EARNINGS		26. PERCENT OF EARNINGS
27. CAUSE OF INJURY									
28. MACHINE, ETC.					29. PART OF MACHINE				
30. NATURE OF INJURY									
31. NUMBER LOS.	32. DISP.	33. L. V. BEGAN	34. RETURNED	35. MED. ATT'N	36. REPORT REC'D	37. REPORT TYPES	38. TIME		
39. PHYSICIAN					ADDRESS				
40. HOSPITAL					ADDRESS				

A91

ACTUARIAL DEPARTMENT COPY

non-compensable cases are handled at least twice by the employer's card unit, and all compensable cases at least three times. For the first eight months of operation of the Unit Plan, the actuarial department verified the lack of an employer's card on all policies with earned premiums exceeding \$500., by consulting the claim department index file, in which cards are kept for each accident in alphabetical order by name of employer. However, as no omissions were found in the employers' cards, it was felt that they were fully accurate, and the checking was discontinued.

Comparison of the carrier's employer's card with the Board experience card will indicate that the columnar arrangement is identical with the exception that the column captioned "loss expense" on the employer's card is replaced by a column captioned "open or closed" on the Board experience card. All closed compensable cases are copied from the employer's experience card to the Board experience card. Closed claims are differentiated from open claims on the Board experience card not only by the symbol "O" or "F", but also by entering closed cases in ink and open cases in pencil, as is done in the employers' cards. Before an entry can be made on the Board experience card for an open case, the copy of the first report of accident, and the individual claim card, which shows the estimated compensation and medical incurred loss and the actual compensation and medical payments, must be pulled from the files and an individual report prepared (see Exhibit 8a and b.) Before the individual report may be prepared, the claim payment and estimate card is carefully examined. Death and permanent total cards are referred to a special unit which handles these types of cases exclusively, for preparation of the necessary report. On other cases, any estimate of incurred loss, which is dated more than three months prior to the valuation date, is not accepted unless it is based on a final award by the Bureau of Workmen's Compensation. A special request for estimate revision (see Exhibit 9) is sent to the claim department on such cases. Cases involving a total incurred loss of over \$500., on which there have been no payments, are questioned. Clerks secure the claim folder from the claim department for examination so that the estimate may be reviewed in the light of latest developments to see that it is neither excessive nor inadequate. Cases on which the claim pay-

EXHIBIT 8a
**COMPENSATION INSPECTION RATING BOARD
 NEW YORK EXPERIENCE**

INDIVIDUAL REPORT OF _____ CASE

CLASS CODE _____ BOARD FILE NO. _____

CARRIER _____

POLICY NUMBER _____ POLICY YEAR _____

ASSURED _____

MANUAL CLASSIFICATION _____

INJURED _____ OCCUPATION _____

CLAIM NO. _____ AGE AT DATE OF ACCIDENT _____

CAUSE OF ACCIDENT _____

NATURE, LOCATION AND EXTENT OF INJURY _____

DEGREE OF DISABILITY _____ % OF _____

_____ % OF _____

VALUATION DATA		INCURRED LOSS AS OF _____ (INSERT VALUATION DATE)	
DATE OF ACCIDENT		COMPENSATION PAID*	
DATE OF BIRTH		COMPENSATION ACCRUED*	
ACTUAL AVERAGE WEEKLY WAGES		PRESENT VALUE OF FUTURE PAYMENTS*	
WEEKLY COMPENSATION		TOTAL COMPENSATION	
		TOTAL MEDICAL	

*REQUIRED ONLY ON CASES COMPENSATED ON BASIS OF PERMANENT TOTAL DISABILITY OR A PERCENTAGE THEREOF.

IF INJURED HAS SUSTAINED ANY PREVIOUS PERMANENT INJURY, SPECIFY NATURE AND EXTENT THEREOF _____

SERIAL NUMBER OF EXPERIENCE CARD ON WHICH THIS CLAIM IS LISTED _____

FOR INDETERMINATE CASES

CONDITION OF INJURED AT DATE OF VALUATION AND PHYSICIANS PROGNOSIS _____

TO WHAT CLASS OF INJURY HAS THIS CASE BEEN ASSIGNED? _____

EXHIBIT 8b
**COMPENSATION INSPECTION RATING BOARD
 NEW YORK EXPERIENCE**

INDIVIDUAL REPORT OF DEATH CASE

CLASS CODE _____ BOARD FILE NO. _____

CARRIER _____

POLICY NUMBER _____ POLICY YEAR _____

ASSURED _____

MANUAL CLASSIFICATION _____

DECEASED _____ OCCUPATION _____

CLAIM NO. _____ DATE OF ACCIDENT _____ DATE OF DEATH _____

AVERAGE ACTUAL ANNUAL WAGES _____ AGE AT DATE OF ACCIDENT _____

CAUSE OF ACCIDENT _____

NATURE, LOCATION AND EXTENT OF INJURIES _____

DEPENDENTS				INCURRED LOSS AS OF	
AT DATE OF DEATH		AT DATE OF VALUATION		(VALUATION DATE)	
RELATIONSHIP	AGE	AGE	ANNUITY		
				COMP. PAID AND/OR ACCRUED TO DECEASED PRIOR TO DEATH	
				COMP. TO DEPENDENTS PAID PRIOR TO VALUATION DATE	
				COMP. TO DEPENDENTS ACCRUED PRIOR TO VALUATION DATE BUT NOT PAID	
				PRESENT VALUE OF FUTURE PAYMENTS	
				FUNERAL BENEFIT	
				PAYMENT TO STATE TREASURER (NO DEPENDENT CASES)	
				TOTAL COMPENSATION	
TOTAL ANNUITY VALUE				TOTAL MEDICAL	

TERMINATION OF DEPENDENCY (DATE AND REASON) _____

LUMP SUM SETTLEMENT (DATE AND AWARD) _____

AWARD TO NON-RESIDENT ALIENS COMMUTED (DATE AND AMOUNT) _____

SERIAL NUMBER OF EXPERIENCE CARD ON WHICH THIS CLAIM IS LISTED _____

ments equal the estimated incurred loss are investigated to ascertain if the case should be closed. Cases involving a third party element are examined carefully to determine the extent of the carrier's liability.

Individual reports on open cases other than death or permanent total are prepared by the same clerks who prepare the experience cards. Open non-compensable cases are not individually reported but are taken at the claim department's estimate of the ultimate incurred loss. In general, open non-compensable cases are valued at \$10. per case unless it is definitely known that the loss will be greater or less than this amount. This \$10. value has been confirmed by analyses of all non-compensable cases included in the carrier's Schedule Z for policy years 1926 and 1927 and is, therefore, considered to be quite reliable.

To provide for the reporting of claims first reported to the carrier after the original experience card has been prepared, a stamp reading "reported to rating board" is placed on the employer's card immediately beneath the last accident listed at the time the first report is made. Whenever an accident is received late and listed below the stamp, the clerk immediately notifies the Statistical Unit, which keeps a record of such cases by month of issue and policy number. These lists are brought up at the time the policies involved are next due for reporting to the Board.

PREPARATION OF EXPERIENCE CARD FOR INTERNAL ANALYSIS THROUGH THE PUNCHING OF HOLLERITH CARDS

At this point additional information, which is used in internal statistical analysis, is entered on the office copy of all experience cards. In the blank space at the lower left hand corner of the card is placed a stamp which provides space for the insertion of the total compensation and medical incurred losses on the risk, the office district through which the policy was written, the code number of the solicitor producing the business (provided that the experience report covers the first year the policyholder is insured with the carrier), the governing classification and industry group, the number of compensable cases and the carrier's accounting

group to which the business has been assigned. The omission of a solicitor's code number indicates that the policy is in its second or succeeding year. The governing classification is determined in accordance with the manual rules, i.e., it is taken to be the classification (exclusive of standard exceptions) which produces the largest amount of payroll. The industry group is determined by coding in accordance with the groups employed for the determination of loss constants, i.e., code 1 indicates a manufacturing risk; (industry schedules 5-25 inclusive); code 2, a contracting risk, (industry schedules 26 and 27) and code 3, an "all other risk", (industry schedules 1-4 and 28-37 inclusive). The number of compensable cases is determined by counting the number of claims listed individually on the loss side of the card, while the accounting group number appears on all bills. The analysis information mentioned above is taken either directly from the actuarial department records or from the audit bill, which in turn is coded by the accounting department from the information shown on the declaration or renewal endorsement covering the policy period for which the experience report is being prepared.

CHECKING, TYPING AND AUDITING OF EXPERIENCE CARDS

The experience cards and the supporting records from which they have been prepared are next routed to a clerk who checks all the information entered on the card. Then they go to the typists who type all individual reports in triplicate and type one copy of the experience card, (omitting the information stamped in the lower left hand corner of the card) making two carbon copies of the card on standard letter-size sheets which have been printed as facsimiles of the face and reverse side of the card. After typing, all cards and individual reports are read back, after which the cards are turned over to a clerk who sorts them by month and year of issue, keeping all cards for any given month of issue (with the proper individual reports attached) in one pack. A pack of from three hundred to five or six hundred cards is accumulated for a given month of issue and sorted into policy number order except when only a few cards remain to be filed for a given month of issue, when smaller packs are necessarily pre-

pared. The cards then go to a comptometer operator, who checks all totals on the typewritten copy of the experience card. This operation provides an additional check on the accuracy of the typing.

The next step is the auditing of the cards by a senior clerk. This covers the following operations:

1. Comparison of classification code numbers and classification wording.
2. Comparison of collected rates and manual rates (on a comparable level).
3. Verification of the availability of the manual classifications used, according to the manual rules in effect at the time the policy was issued or renewed.
4. Verification of the correct application of the loss and expense constants, if required.
5. Checking of classification coding on losses with coding of payrolls, to ensure all losses being covered.
6. Examination of loss card to see that an individual report has been prepared on every open case, and checking of the report against the loss card.

The typewritten and manuscript copies of the experience cards are then stamped with the Board serial number, this number also being stamped in an index register which shows the policy number of all cards in Board serial number order. The typewritten copies of all experience cards and the original copy of the individual reports accompanying them are then returned to the typists, who type the Board serial number, as shown on the experience card, on the individual reports. The cards are then totaled to produce the control figures to be included in the Board letter of transmittal. The totals shown are payroll exposed, (per capita and window cleaning exposure separately), premium earned, and losses incurred. These totals are prepared on adding machine tapes from the typewritten copy of the card, and are checked back against the manuscript copies, thereby insuring against typographical errors in the totals on the individual cards.

PUNCHING, VERIFYING AND BALANCING OF HOLLERITH RISK
EXPERIENCE CARDS FROM BOARD EXPERIENCE CARDS

The manuscript copies of a pack of Board experience cards chargeable to a given month and year of issue are turned over to Hollerith key-punch operators who punch a "Risk Experience Card" shown as Exhibit 10 from the Board experience card.

The following data are punched on the risk experience card:

- (1) Policy number.
- (2) Month and year of issue. This is the anniversary or renewal date which appears as the beginning of the policy term on the experience card.
- (3) Coverage. Under this item, code 1 is punched on all policies providing full medical coverage except policies on which a hospital allowance or medical contract is in effect. These are coded 3 and 4 respectively. Ex-medical policies are punched code 2.
- (4) The loss and expense constant, if any, is punched direct from the experience card.
- (5) Total policy premium. This is punched from the last line on the experience card.
- (6) and (7)
Compensation incurred loss and medical incurred loss. These items are punched from the analysis stamp in the lower left hand corner of the experience card.
- (8) District. The district is punched according to the following code:

<i>Office</i>	<i>Code</i>
New York	1
Albany	5
Syracuse	6
Rochester	7
Buffalo	8
General (Involving credit to more than one office)	9

- (9) Solicitor. This column is punched only on new business. The various solicitors are assigned code numbers which are punched in the solicitor's column.

- (10) New or renewal. The presence of a solicitor's number on the experience card indicates that the risk is new business. Such risks are coded 1, while cards not showing the solicitor's number are coded 2.
- (11) Governing class. This is punched from the analysis stamp to show the governing class to which the risk is chargeable.
- (12) Number of compensable cases. This item is also punched from the analysis stamp in the lower left hand corner of the card.
- (13) Date of entry—month and year. These columns are used purely for internal statistical control and indicate the month and year in which the cards are actually punched and, therefore, the month and year of submission of the experience card to the Rating Board.
- (14) Code 1 is punched in column 42 if the risk is subject to a minimum premium. Risks not subject to minimum premiums are not punched in this column.
- (15) Code 1 is punched in column 43 to indicate risks cancelled before the normal expiration of the policy term. Risks which are cancelled on the anniversary date are not punched as cancellations but are considered as normal expirations.
- (16) The industry group to which the risk is chargeable is punched in column 44. This is punched from the code number following the governing classification in the lower left hand corner of the experience card.
- (17) In column 45 is punched code 1 if the risk is assignable to one of the carrier's special accounting groups and code 9 if the risk is assigned to the general group. The actual group number appears in the analysis stamp after the number of compensable cases.

After the cards have been punched, they are verified. The use of the Hollerith verifier is now so general that any description of its principles in this paper would be superfluous.

After the cards have been verified, they are run through

the tabulator for non-listing totals showing the following information:

- (1) Card count. (This indicates the number of experience cards and also the number of policies included in the pack of cards being prepared for filing.)
- (2) Total policy premium.
- (3) Compensation incurred loss.
- (4) Medical incurred loss.

These totals are then compared with the totals secured for the preparation of the Board letter of transmittal. If a difference is found, the Hollerith cards are listed and checked back against the adding machine tape on which the totals for the letter of transmittal were prepared. When the Hollerith cards and the experience cards have been balanced, the letter of transmittal is prepared, the totals are entered in a register which shows the first and last serial number of the cards included in the pack, the month and year of issue, the date of filing (which coincides with the date on the letter of transmittal and the month and year of entry punched on the Hollerith card) the total policy premium, the total compensation and medical incurred losses, the total incurred loss ratio and whether the premium on the cards is on an audited or estimated basis. In this connection, all premiums which have been determined from final adjustment bills are assumed to be audited, although in some cases they may have been based on an estimated adjustment or the retaining of the deposit or minimum premium due to the impracticability or impossibility of securing an actual audit.

The typewritten copies of the experience cards, together with the accompanying individual reports, are then sent to the Board by messenger with the standard letter of transmittal, accompanied by a special form of return letter which is stamped and returned by the Board when they have checked and verified the totals on the letter of transmittal with the experience cards submitted to them. The manuscript copies of the experience cards are retained in Board serial number order until the Board has returned the copy of the transmittal letter, when the experience cards are combined with cards previously submitted for the same month and year of issue in policy number order. The manuscript

copy of the individual report is clipped to the manuscript copy of the experience card; the typewritten copy of such report being filed separately by policy number within month of issue so that these reports may be automatically brought up for second, third and fourth reports at the proper valuation dates.

PREPARATION OF REVISED EXPERIENCE CARDS OTHER THAN SECOND, THIRD AND FOURTH REPORTS

In many cases, reaudits necessitate the filing of revised experience cards, while in other cases, audits are received on policies which have been previously submitted on an estimated basis. In some few cases, it is necessary to correct the losses reported. In these cases, a revised card, form No. 216, appended as Exhibit 11a and b, is prepared. This card shows the policy number, name and address of the assured, period of coverage, risk locations and special conditions affecting coverage, which are usually identical with the original report. In the "previously reported" columns are shown the amounts previously reported on only those classifications which are affected by the revised audit bill or audit bill substituting for the previously submitted estimate. The revised columns show the corrected payrolls, rates and premiums for the changed classifications. If a loss change is being made, only the case or cases involved are listed individually. On the total lines are shown the total amounts involved as previously reported and as revised. The same internal analysis stamp is placed in the lower left hand corner of the revised card. This stamp shows the revised information. Cards of this type are prepared currently for exposure changes and as required for loss changes. These cards are also segregated by month of issue and are attached to the original experience card, which they adjust, and are sent to the Hollerith unit where a contra risk experience card of a distinctive color is punched showing the information entered on the original experience card. A corrected original Hollerith card is punched from the revised exposure card to show the corrected total figures. The contra and corrected cards are then run through the tabulator separately and the separate totals balanced to the previously submitted and revised totals shown on the letter of transmittal accompanying the revised cards. The

revised experience cards bear a separate series of serial numbers which are prefixed by a letter "R" in the register to differentiate them from the original reports, and bear the notation "revised" to differentiate them from second, third and fourth reports.

PREPARATION OF REVISED EXPERIENCE CARDS SHOWING CHANGES IN LOSSES DUE TO SECOND, THIRD AND FOURTH VALUATIONS

The carrier estimates its losses incurred currently by a "running total" method which separates first estimates from revised estimates (see Exhibit 7). Whenever a closed case, either compensable or non-compensable, is reopened to show additional liability, the estimate clerk examines the month and year of issue to which the case is chargeable and lists on a form captioned "Cases Reopened" (see Exhibit 12) all cases chargeable to a month and year of issue more than eighteen months previous to the current date. Separate sheets are prepared for each month and year of issue showing case number, policy number, revised estimates, previous estimates and date of reopening. Thirty months after the beginning of the month and year of issue, these lists, together with all individual reports for the corresponding month and year of issue, and the lists of claims reported late, are withdrawn from the files and all policy numbers involved listed. The employers' cards for these policy numbers together with the last reported experience card are then drawn from the files and a revised card, form No. 216, is prepared to show all changes in losses. These cards do not show any changes in exposure as such changes are taken care of currently, unless the exposure change occurs at exactly the same time as the case is brought up for loss revaluation. On the reverse side of form No. 216 are listed individually all cases reported as open in the previous report, all claims which have been reopened and all cases on which the first report of accident was received subsequent to the last report to the Board. Revised individual reports are prepared on all the above types of cases. These reports are filed separately in the same manner as the original individual reports so that they may be brought up for subsequent revaluation at the proper time. The cards are marked "second report," "third report" or "fourth report" to distinguish them from revised cards. These cards are then typed, the typist making two carbon copies on standard

letter-size sheets which have been printed as facsimiles of the face and reverse side of the revised card. These copies are also made on exposure and loss revisions. After typing, the revised cards are sent to the Hollerith unit for the punching of contra risk experience cards and revised original cards in the same manner as the revised exposure and loss cards. The revised loss card also bears the analysis stamp so that the Hollerith unit may code the proper revised analysis data. After punching, the punch card totals are similarly balanced to the letter of transmittal and entered in the control register.

PART III

INTERNAL ANALYSIS WORK CARRIED ON AS AN EXTENSION OF THE PREPARATION OF DATA UNDER THE NEW YORK UNIT STATISTICAL PLAN

(a) *Copies of Individual Risk Data for Underwriting
and Safety Service Analysis Work*

The carbon copies of the original and revised Board experience cards are separated after typing and one copy is sent to the underwriting department and the other copy, to which the third copy of the individual report is attached, is sent to the safety service department. The underwriting department copies are filed in the individual risk underwriting folders to serve as a guide for underwriters in answering inquiries by policyholders as to the losses incurred on their risks for experience rating purposes. The safety service copy is used by that department in servicing policyholders and as a guide for constructive accident prevention work.

(b) *Statistical Analyses Prepared from
Hollerith Punch Cards*

The Hollerith risk experience cards which were punched from the original and revised copies of the experience cards submitted to the Rating Board, are sorted by year of issue, contra cards

being separated from original cards. The cards are then run through the tabulator to secure non-listing totals, which are balanced to the control register. If the totals do not balance, the cards are sorted out by month and year of entry and balanced to the individual entries in the register.

The first tabulation prepared by the carrier from its policy year 1928 risk experience cards was an analysis by industry group. This analysis showed the number of policies, total earned premium, premium derived from loss and expense constants, compensation incurred loss and medical incurred loss separately for manufacturing business, contracting business and all other business with each of these three groups separated between full medical business (including business written on a hospital allowance or medical contract basis) and ex-medical business.

The second tabulation was an exhibit of the experience on all 1928 issues or renewals according to size of risk. This was divided as between minimum premium business and non-minimum premium business, each of these groups being sub-divided into groups by size of premium. These premium groups were determined so that they corresponded exactly with the premium groups used by the Rating Board in the preparation of the size of risk experience for policy years 1924 and 1925. In preparing this tabulation, it was necessary to adjust the premium size groups to reflect the rate differential between this carrier's business and the business of other carriers. In other words, the Rating Board premium group, including all risks with earned premiums from \$100. to \$200., would correspond with the carrier's premium group covering risks with earned premiums from \$85. to \$170. This, of course, is because of the fact that this carrier wrote business during policy years 1928, 1929 and 1930 at 85 per cent. of Rating Board manual or adjusted rates. This tabulation showed the number of policies, the total policy premium, the premium realized from loss and expense constants, the compensation and medical incurred losses, the compensation and medical loss ratio and the total incurred loss ratio for each size group, a sub-total for risks under \$340. (this corresponds to a Rating Board group of risks under \$400. which is the experience rating line of demarcation), a sub-total of risks over \$340., and a grand total for all business.

The third tabulation which was prepared showed the experience by governing classification. This tabulation showed for each governing class the number of policies, the total policy premium, the compensation incurred loss, medical incurred loss, the number of compensable cases and the compensation, medical and total loss ratios. To assist the carrier's representatives on the Classification and Rating Committee of the Board in properly analyzing its business in connection with the selection of pure premiums for the 1931 revision of rates, it was necessary to tabulate as much experience as was available on the policy year 1928 Hollerith cards, by governing classification. The value of this information was such that it was decided to punch governing classification master cards for the partial tabulations already made by governing class, punching subsequent master cards on a complement basis where necessary to bring the governing classification experience previously tabulated up to date without the necessity of running the cards over again. This process involved the subtraction of all original cards which had been eliminated by contra cards and also the contra cards which eliminated these entries. As partial tabulations had already been made, these partial tabulations were brought down to a net by clerks, i.e., the amounts shown on the contra card runs were deducted from the amounts shown on the original card runs and master cards punched for the net figures. It was necessary to repeat this procedure when the final figures became available for the balance of the 1928 year of issue by deducting the additional contra cards from the additional original cards. By the use of the complement basis, it was possible to punch governing classification master cards which could be run so as to show single figures for each classification for the entire 1928 year of issue. Experiments are now being conducted with a quadruplicate tabulating roll for the production of tabulated lists showing governing classification experience without the necessity of recopying this information by typing or by the "Ditto" process. Indications are that a quadruplicate tabulation may be feasible.

The fourth tabulation showed an analysis of the industry group figures by districts, and also separated between experience rated and non-experience rated business. For each industry group, and in total for all industry groups, the exhibit showed the number

of policies, total premium, compensation, medical and total incurred losses and total loss ratio, for each district office, and separately for policies with premiums under \$340., and with premiums of \$340. and over, within each district.

The fifth tabulation was an exhibit of premiums on new business during 1928. The exhibit showed, for each district office, the "counter" business (unsolicited business brought to the carrier's office by the policyholder, or business secured by a district manager or home office executive) and for each solicitor, the business brought in on issues of 1928. Data shown covered the number of policies, the earned premium, premium derived from loss and expense constants, and compensation, medical and total incurred losses, with the corresponding loss ratios. This exhibit, considered in conjunction with an exhibit showing solicitor's expenses (salary and traveling) enabled the assistant manager in charge of business acquisition to judge the relative merits of his solicitors, not only as to volume of business written, but also as to its quality.

Running tabulations of the experience of the carrier by month and year of issue are prepared currently from the control register. These tabulations show the month of issue, number of policies reported to the Board, the total earned premium and the total incurred losses, compensation and medical, added together, and the total incurred loss ratio. These tabulations are brought up to date each month by combining the register entries for the latest month with all entries previously tabulated. This gives a current exhibit of the loss ratios by month of issue and on an accumulative basis.

The foregoing outline of a supplementary statistical procedure in connection with the data filed with the Rating Board under the Unit Statistical Plan will convey some idea of the possibilities for detailed statistical analysis of workmen's compensation business as a by-product of the preparation of data under the Unit Statistical Plan. These analyses are somewhat limited due to the comparatively limited capacity of a 45 column punch card. The physical limitations of office space prohibit the adoption of an 80 column Hollerith installation by the carrier at this time, but such an installation is contemplated as soon as additional space for tabulating purposes is available.

It is hoped that the foregoing exposition of a method now in use may prove of assistance, but the system outlined is not claimed to be more than a preparatory step in the direction of complete underwriting and actuarial analysis of this type of business. Much remains to be done, and it is hoped that this paper may stimulate discussion of the subject, to the end that the full possibilities of the Unit Statistical Plan may be realized. In this connection, a paper dealing with the operation of such a plan from the viewpoint of the central rating organization assembling and tabulating the data, would be of particular interest.