

A SYSTEM OF PREPARING RESERVES ON WORKMEN'S
COMPENSATION CLAIMS

BY

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The various methods which have been used or proposed for the calculation of workmen's compensation loss reserves have fallen under one or the other of the following headings or have been a combination of both. (1) An estimate of the probable cost of outstanding losses by individual estimates, or (2) that part of the expected loss payments which are unpaid at the date of valuation; that is, a certain percentage of the earned premium less the paid losses. The method of calculating the compensation loss reserves provided for in Schedule P of the convention form of annual statement is a combination of the two methods mentioned above. The actual outstanding losses are calculated for each year of issue. For the last three years of issue the reserve is calculated by taking 65% of the earned premium less losses and loss expense paid. The reserve actually set up for these last three years is either this reserve or the individual estimates of outstanding losses, whichever is the greater. The purpose of this paper is to describe the method of keeping individual estimates of outstanding compensation claims which is now being used by The Travelers Insurance Company.

The system involves no new or exceptional principle. The outstanding losses are valued in the same manner as has been followed for a number of years past. In the early days of compensation reserve records it was the practice, whenever it was necessary to obtain outstanding losses, to obtain from the claim department every open claim file and to list or punch on Hollerith cards the necessary information. This method did not produce satisfactory results. The work was necessarily done in a hurry in order not to interfere with the regular flow of work through the claim department any more than necessary. Naturally such a hastily prepared record involved more than a reasonable number of errors. There was also the further drawback that because of claim files being out of file for various reasons there was no certain assurance that all open files were received.

The next system adopted consisted of the carrying of the reserve record currently on Hollerith cards. Briefly, this plan was as follows:—When notice of an incurred claim was received it was forwarded to the actuarial department where a card was punched for the incurred amount or amounts; when a change in estimate occurred another report was received and from this report the new incurred amount was punched as an addition to the reserve and a card for the previous incurred amount was punched as a deduction from the reserve. The total of the paid drafts was deducted from the reserve. The reserve at the end of any month would be determined by adding to the reserve at the end of the previous month the amount of the new incurred claims plus the amount of the revised estimates (gross) less the amount of previous estimates (gross) on revised cases and less the amount of drafts paid during the month. This system, while producing an accurate reserve in theory did not prove satisfactory. There was no effective bookkeeping control. A Hollerith card record of individual claims is not a satisfactory unit record, particularly where a single claim is represented by several cards. Individual claims lost their identity and it was impossible to check the reserve with the claim department or with any other records.

To overcome the defects of the two systems briefly described above, the present system was evolved. This system is, in effect, similar to the system first mentioned in that the basic record is a unit statistical history of each outstanding claim. It is a fact that the work involved in maintaining this record duplicates to a certain extent work being done in the claim department. This individual record used solely for reserve purposes has overcome the defects incident to the first described system in that it insures that every claim is used in the reserve record and it also overcomes the principal defect in the second described record inasmuch as every step in the reserve process is balanced and there is a proper control on the work.

The basic record of the system is the "Compensation Loss Reserve Card" (See Exhibit No. 1). This card is divided into three sections—the first section provides for registration and identification data; the second section a record of incurred costs and the third section a record of draft payments. An explanation of the various items follows:

Registration

- Form In this space is entered the code number to designate the form of policy under which the loss was incurred. For example, industrial compensation is coded 90 and coal mine compensation 91. By means of additional form codes this system could be extended to liability and other lines of casualty insurance.
- Notice Number This is the designating number of the claim.
- Accident Month & Year This is the month and year in which the accident occurred.
- Policy Year This is the year in which the policy under which the loss occurred was issued.
- Serial Number As each new claim is received in the actuarial department it is assigned a serial number and the notice number together with other information is entered after this serial number in a register. In connection with this reserve system, the serial number serves as a means of locating the file in case the notice number is incorrectly entered.
- Adjusting Office In this space is entered the code number of the office through which the particular claim is handled.
- State In this space is entered the state to which the accident is chargeable.

Incurred Cost

- Month, Day, Year The date of entry.
- Kind of Injury Kind of injury is coded. The code is as follows:
 5. Fatal
 6. Permanent total
 4. Permanent partial
 2. All other
- Claim The amount of incurred compensation indemnity.
- Medical The amount of incurred compensation medical.

Drafts Issued

- Month, Day, Year The date draft is paid.
- Draft Number The number of the draft (for identification purposes).
- Claim The amount of payment—indemnity.
- Medical The amount of payment—medical.

Memo

- Claim, Medical These spaces are provided for entering totals of indemnity and medical paid to date as of any reserve period.

The compensation reserve division is divided into seven units, each unit consisting of a supervisor, a file clerk and a machine operator. The loss reserve cards are filed according to adjusting office in numerical order and each supervisor has charge of a group of adjusting offices. All entries on the loss reserve cards and almost all other entries in connection with the reserve work are made on special Burroughs Bookkeeping machines. The cards are filed in boxes in specially constructed desks of the tub desk variety. The special Burroughs Bookkeeping machines used in connection with posting entries to the loss reserve cards are of the duplex type and so designed that the carriage holds the loss reserve card (Exhibit No. 1) on the right side and a proof sheet (Exhibit No. 2) on the left side. The proof sheet will be described at a later point. The machine rollers are, of course, in two parts which permits the cards to be inserted and taken out of the machine without disturbing the proof sheet. Special keys are provided on the machine and since codes are used to designate adjusting office and kind of injury the machine serves for this particular job the purpose of both a transcribing and adding machine.

The data entered on the Compensation Loss Reserve cards are obtained from four sources, namely, notices of new claims; special reports (revisions of previous estimates); closed cases and draft payments or vouchers. The manner in which the information taken from each of these sources is entered on the reserve cards will be described individually in the order named. At this point it is pertinent to state that all estimates of incurred costs for compensation indemnity and medical are made by the company's adjusters in the field with the exception of certain fatal, permanent total and other claims involving life annuities which will be referred to at a later point.

The same form of proof sheet (Exhibit 2) is used for all four operations mentioned above. This sheet provides for designating the kind of operation being performed, the date of operation and the adjusting office. The sheet is divided into two sections—the "pre-listing" section and the "accumulator" section. The work is in fact done in duplicate. This is the best control on the accuracy of the work that has been developed to date and is believed to be sufficient. For certain operations the pre-listing, as the heading indicates, is made prior to the entry of the items

on the reserve cards and in the "accumulator" section and for others the order is reversed. The pre-listing is done on a Duplex Burroughs machine with split adding fields so that the addition of four columns of figures can be handled in practically all operations. This feature is necessary in connection with the operations designated on these sheets as "Specials" and "Closed Cases." The accumulator section is filled in at the same time that entries are made on the loss reserve cards.

NEW CLAIMS

Notices of new claims are received in the actuarial department on a form called a "Pending Claim Report." Each such report contains all information necessary to complete the first section of the loss reserve card together with the estimated indemnity and medical cost of the case. To facilitate the work of entering the data the information to be registered in code is coded before the reports are sent to the reserve division. After the reports are coded they are sorted to adjusting office and pre-listed. The pre-listing on this operation is the same as any two column addition on a split adding machine. The indemnity incurred is entered in the "Claim" column and the medical incurred in the "Medical" column. The pre-listing sheets, together with the accompanying reports, are then turned over to the unit supervisors. It occasionally happens that a draft will have been paid before the pending claim report is received in the actuarial department and in such a case a card is made up in skeleton form from information contained on the draft stub. The card file is searched for such cards and, if any are found, they are turned over, together with the proof sheet and the reports, to the machine operator who proceeds to make up new cards for those cases for which no card was in file and complete the registration and postings on those cards which were found to be in file. The procedure is as follows: The proof sheet is inserted in the left side of the carriage and the card in the right side. After the necessary information has been inserted in the first section of the reserve card and the date, kind of injury, incurred claim and incurred medical entered on the first line of the incurred cost section, a lever is pressed which holds down the keys which control the

incurred claim and incurred medical. Another lever is pressed which shifts the carriage to the position just previously occupied by the card and the amounts which have been registered on the card are again registered on the proof sheet in the first two columns of the "accumulator" side. The machine registers but does not add in the first position and both registers and adds in the second position. The card is then removed from the machine but the proof sheet remains. This operation is repeated until cards have been prepared for all new claims of the particular adjusting office. When the last card has been removed from the machine a total lever is pressed which prints the total incurred claim and total incurred medical entered on the "accumulator" side. The totals on the accumulator side are then compared with those on the pre-listing side. If totals do not check it is a very simple matter to examine the proof sheet (Exhibit 2) and determine the error or errors. The two independent listing operations do not provide an absolute check on the accuracy of the work as it is possible that both operators may make an error of the same amount. However, such instances are rare.

SPECIAL REPORTS

Whenever any change in the status of a claim has taken place which materially affects the estimated indemnity or medical cost, and at least every three months, a "Special Report" is prepared by the adjuster and sent to the home office claim department. This special report is similar to the pending claim report in that it contains or provides for all of the registration information contained or inserted on the pending claim report. This report is divided roughly into two parts—one part shows the revised estimates and the other part which is headed "For Home Office Use Only" provides for inserting the last previous estimates of incurred claim and medical. The files are pulled in the claim department and the necessary coding and amounts of last previous estimates transferred to the special report.

In the case of New York fatal and permanent totals and other claims involving life annuities the special reports are prepared in the actuarial department from a card file containing the necessary

data for each case. The special reports are made up at intervals of six months or whenever there is a development affecting the incurred claim cost. The actuarial department enters only the annuity value or outstanding amount. The amount paid to date is added to the outstanding by the claim department to produce the revised estimate of total incurred cost.

These special reports are sent to the actuarial department daily and the procedure is substantially the same as in case of the pending claim reports. As these reports apply to already existing claims the claim cards are drawn from the file and turned over to the Burroughs machine operator together with the special reports. In this particular operation the pre-listing is done subsequent to the entering of the items on the cards and on the accumulator side of the proof sheet. This procedure is desirable inasmuch as errors sometimes are noted on the special reports and must be turned back to the claim department for correction before they can be used. The machine operator enters the date, kind of injury and latest incurred claim and medical costs on the card in the first empty line of the incurred cost section. These incurred amounts are then carried over to the accumulator side of the proof sheet. The next operation consists of registering and adding in the accumulator side of the proof sheet the last previous incurred claim and medical costs. This involves the duplex feature of the machine previously mentioned. The incurred costs for the previous estimates register to the right of the incurred costs for the latest estimates. This feature is not of consequence but simplifies the identifying of the new and old items. When all the items have been entered on the cards and on the proof sheets the totals of both the upper and lower registers are taken off showing the four column totals previously mentioned, that is, the total of the new claim and medical incurred costs and the total of the old claim and medical incurred costs. The special reports are then turned over to an operator who proceeds with the pre-listing operation and the four totals are compared for a check the same as in case of the operation in connection with the pending claim reports. There is also a further check in case of this particular operation in that the operator working on the cards takes the old estimates from the cards, whereas the operator doing the pre-listing work takes the old estimates from the "For Home Office Use Only" section of the special reports.

Probably a clearer understanding of this operation will be obtained from a study of Exhibits 1 and 3 attached, particularly Exhibit 3, which shows the results of the operations of the split column duplex machines.

CLOSED CASES

When a file has been closed by the issuance of a draft in final payment of the case, or for any other reason, a final report of loss is filled out in the adjusting office and sent to the home office claim department. The final incurred costs are entered on the claim file after checking with the final report and claim file is then sent to the actuarial department. The procedure is substantially the same as in case of the handling of special reports. The pre-listing operation comes last since it is sometimes necessary to return files to the claim department for certain corrections. The final amounts paid are entered on the reserve card in the incurred cost section and also transferred to the accumulator side of the proof sheet. The last previous incurred costs are also entered on the accumulator side in the right hand position. After totaling, the claim files and proof sheet are turned over to another operator for the pre-listing work. The operator working upon the cards on the accumulator side of the proof sheet takes the last previous incurred costs from the reserve cards and the pre-listing operator takes such incurred costs from the claim files, thus providing a further check on the accuracy of the work similar to that provided in case of the special reports. The reserve cards are then taken from the active file and filed in the closed file. However, before this is done the draft payments are added in order to make sure that the total of the payments on the card, both claim and medical, equal the final incurred cost posted in the incurred cost section of the card. It sometimes happens that a file will clear through to the actuarial department before all issued drafts have been paid. This occurs for the reason that the claim department files are operated on a written draft basis, whereas the actuarial department records must of necessity be maintained on a paid draft basis. In such cases the draft numbers for the missing item or items are entered on the reserve card in pencil and the card is put back into the open file where it remains until the drafts necessary to complete the case have been paid and entered on the card.

DRAFT PAYMENTS

Whenever a payment is made on a claim a draft stub or voucher is sent to the home office. These vouchers are received in the actuarial department daily together with a bookkeeping control figure. For purposes of the compensation reserve work the vouchers are sorted to adjusting office and the payments for each adjusting office are pre-listed and totaled on the proof sheet before the draft vouchers are turned over to the unit supervisors. The totals of all the proof sheets are balanced to bookkeeping control amounts. The procedure from this point on is substantially the same as in case of the three previously described operations. The loss reserve cards are drawn from the files and turned over together with the proof sheet and vouchers to the machine operator who enters the draft payments in the "Drafts Issued" section of the loss reserve card and also on the accumulator section of the proof sheet, the totals of this section being checked with the totals of the pre-listing section. It will be noted that this operation, like the operation in connection with the pending claim reports, involves only the single split column adding feature. Examples of the details of this operation are shown on Exhibits 1 and 4.

REOPENED CASES

In compensation insurance there are a substantial number of cases reopened for payment of additional medical fees or for other reasons. In such cases the actuarial department receives advice on a form which shows the amounts paid at the time of closing the case and the estimated additional cost of the payments still to be made. A new card is prepared showing the usual registration and identification data and the new incurred cost—that is, the amount of previous payments plus the estimated amount of future payments are entered in the "Incurred Cost" section of the loss reserve card. The amounts paid to date are entered as totals in the "Drafts Issued" section of the card. From this point on the handling of the case is the same as the handling of regular open cases.

The proof sheet totals are posted daily to a card designated as a "Compensation Outstanding" card. A card is maintained for each adjusting office. These cards are in the nature of sub-

subsidiary ledger accounts. There is also a card for all adjusting offices combined to which the individual adjusting office totals are posted monthly. This card is in the nature of a general ledger account. The card in question is contained in Exhibit 5. The various headings are self-explanatory. At the beginning of each month the balances as of the end of the previous month are entered in the first line of the section headed "Balance." A special direct subtracting adding machine is used. The previous balances are picked up on the machines and the additions or subtractions from the reserve transcribed into the proper columns—drafts paid, old estimates and new estimates—and the proper deductions or additions are made automatically, the final result being the new balance. At the end of each month the adjusting office totals are transferred to the so-called control account card and the balances shown on this card are the total amounts of claim and medical outstanding.

The system does not take into consideration incurred but not reported items, as it is designed to deal only with claims actually reported and the question of reserve for incurred but not reported claims is a separate one.

At the end of each quarter the reserve is drawn off from the individual loss reserve cards. This serves as a further check upon the accuracy of the accumulation of the reserve on the compensation outstanding cards and also furnishes detailed information which is used for various purposes such as the determination of policy year loss ratio experience, loss ratio experience by states for Schedule W and a check on the accuracy of our Schedule Z results. Various tabulations are made at the end of each quarter, the tabulations as of the end of the year for Annual Statement and other required or desirable purposes being carried out in greater detail than the tabulations at the end of the three previous quarters. The necessary information is transferred from the individual loss reserve cards to Hollerith punch cards. A copy of the punch card used is shown in Exhibit 6. This is a simple card and requires no particular explanation. The first step in the process after all entries have been posted for the month is to add up and enter in pencil in the "Memorandum" column at the right of the individual loss card the total amount of claim and medical payments to date. These additions are checked and the cards are then divided into small groups, about 100 to the

group, and totals of the four items—incurred claim, incurred medical, paid claim and paid medical—are drawn off on an adding machine. These totals are entered on a special slip which is placed with the cards. The cards are then turned over to punch operators who punch out the identification data and other coded information and the four monetary items just referred to. Credits because of adjustments sometimes occur in the "Drafts Issued" section of the loss reserve card and such credits are translated to the punch cards by means of punching complements. The punch cards for each group of loss reserve cards are then balanced on the Hollerith tabulating machines to the totals predetermined by the adding machine listings and any errors corrected. When a balance has been effected between the adding machine totals and the punch card totals the punch cards are then ready for such tabulations as are required.

While the within described system has been in operation less than two years, the results so far obtained have been entirely satisfactory. The division employs approximately twenty-eight clerks and the equipment, in addition to desks and the usual filing equipment, consists of nine special Burroughs Bookkeeping machines and six regular adding machines. While the expense of putting the system into operation was material, it is felt that as experience is obtained the ultimate cost of maintaining the system will not be disproportionate in view of the accurate results obtained and the value of such results, both from the standpoint of preparing annual statement and other filing data and the internal value from the company's standpoint. The force carrying on the work has been gradually reduced and it is believed that certain contemplated changes in handling the detail work will further reduce the personnel required.

In order to start the system it was necessary to prepare cards for all open compensation cases. This was done by referring to the claim files and entering the necessary registration and identification data in the first section of the card, the latest incurred cost in the "Incurred Cost" section of the card and the total amount paid to date in the "Drafts Issued" section of the card. This work was done by experienced clerks and carefully checked.

It may be observed that the system stresses the point of carefully checking practically every step by duplicate operations. It is believed that this is necessary and well worth while because

of the resultant accuracy of the records, particularly since with the exception of the paid draft items, there is no absolute control to which the department can balance its results.

While the system is designed primarily for compensation, it is obvious that it is applicable to maintaining reserves for almost any line of insurance and it is evident that for most lines the cost would not be as great in proportion to the number of claims as in case of compensation since the average number of entries per claim would be much less.

EXHIBIT 1

COMPENSATION LOSS RESERVE

ACC.	POL. Yr.	FORM 900	NOTICE NO. 1245581	
Mo. Yr.		SERIAL No.	ADJUSTING OFFICE	STATE
AUG 27 '27		367531	158	04

INCURRED COST

MO. DAY Yr.	KIND INJURY	CLAIM	MEDICAL
OCT 14 '27	2	200	250
NOV 18 '27	2	200	750
DEC 21 '27	2	533	750
MAY 5 '28	2	183	618

DRAFTS ISSUED

MO. DAY Yr.	DRAFT No.	CLAIM		MEDICAL		MEMO.	
						CLAIM	MED.
OCT 12 '27	66287			9	20		
OCT 19 '27	66033	50	01				
OCT 20 '27	66171			90	00		
NOV 2 '27	66342	33	34				
NOV 2 '27	66590	33	34				
NOV 22 '27	66983			86	50		
NOV 22 '27	66897			3	25		
NOV 25 '27	66879	33	34				
DEC 6 '27	67336			2	20		
DEC 8 '27	67241	33	34				
DEC 18 '27	581512			155	25		
JAN 17 '28	582334			37	50		
FEB 17 '28	583069			146	50		
FEB 17 '28	583109			31	50		
FEB 28 '28	583296			51	50		
FEB 29 '28	583297			41	50	183	618

DATE CLOSED MAY 5, 1928 DATE REOPENED _____

260 PREPARING RESERVES ON WORKMEN'S COMPENSATION

EXHIBIT 5

COMPENSATION OUTSTANDING

Adjusting Office BALTIMORE No. 7

DATE	-DRAFTS PAID		-OLD ESTIMATES		+ NEW ESTIMATES		BALANCE	
	CLAIM	MEDICAL	CLAIM	MEDICAL	CLAIM	MEDICAL	CLAIM	MEDICAL
3 31					36.00	43.00	110,092.00	127,110.00
4 2					284.00	270.00	110,412.00	130,240.00
4 10						5.00	110,412.00	130,290.00
4 11					380.00	364.00		
4 12					153.00	69.00	110,955.00	134,620.00
4 13					68.00	40.00	111,018.00	135,020.00
4 14					348.00	260.00	111,366.00	137,620.00
3 14			1,234.50	1,308.00	1,243.20	1,488.00		
						8.00		
					160.00	3.00	111,613.00	139,400.00
3 16			237.00	79.00	7,976.00	826.00		
			210.00	28.00	2,050.00	225.00		
					44.00	2.00	111,719.00	139,630.00
3 17								
					89.00	84.00		
4 18	16.67		691.00	629.00	373.00	835.00	117,285.00	140,990.00
			140.00	70.00	160.00	70.00		
4 18					87.00	50.00	117,170.33	142,160.00
4 19					73.00	16.00	117,257.33	142,210.00
			75.00	15.00	3,237.00	275.00		
			66.00	135.00				
			32.00	12.00	373.00	135.00	119,681.33	143,505.00
4 20			39.00	22.00	280.00	19.00		
			39.00	40.00	39.00	30.00		
4 20					360.00	277.00	119,662.33	142,570.00
4 21			470.00	500.00	1,487.00	250.00	119,962.33	143,340.00
					54.00	24.00		
4 21			50.00	130.00	495.00	102.00	116,603.33	143,080.00
					67.00	89.00		
4 23					286.00	175.00	116,856.33	143,690.00
4 24			55.00	290.00	2,189.00	560.00	117,142.33	145,440.00
					162.00	101.00		
					651.00	492.00		
4 25			141.00	103.00	221.00	81.00	119,596.33	154,140.00
4 26			244.00	75.00	2,630.00	72.00	119,676.33	153,900.00
					1,461.00	327.00		
						62.00		
4 27			589.00	530.00	451.00	487.00	121,159.33	187,400.00
						1.00		
4 28			287.00	291.00	359.00	302.00	121,021.33	187,100.00
					20.00	15.00		
4 30	14.00	0*	517.00	145.00	309.00	119.00	121,113.33	187,360.00
	234.00	77.8*	562.00	335.00	324.00	335.00		
	13.00	0*	44.00	30.00	41.00	142.00		
			346.00	166.00	486.00	161.00		
						29.00		
					51.00	9.00		
					604.00	347.00		
						61.00		
						2.00		
					315.00	251.00		
					77.00	48.00		
4 30	9891.57	4087.25					120163.33	185417.00
							110172.16	154546.50

