

*The Role of the Actuary*

What problems, if any, have been created or are anticipated from an administrative and organizational point of view as a result of the responsibility for computer operations being vested in other than the senior actuary with respect to

- (i) special work such as dividend estimates, rate calculations, etc.;
- (ii) the repetitive calculations of dividends, cash values, etc., required for each policy;
- (iii) the calculation of aggregate reserve and other similar liability items?

MR. JASPER E. MOORE: In order to justify the investment of perhaps  $2\frac{1}{2}$  millions, a medium-size company must aim to consolidate as many functions as possible into the computer routines and must adopt a "total systems" philosophy in solving problems of administration and organization that will arise as a result of this maximum consolidation.

Because many of the end results of the system are statement items for which the actuary is responsible, he must be involved in the design of the system and the controls that are built into it.

The calculation of dividends, cash values, etc., for individual policies is certainly one of the policy servicing functions that should be incorporated into the basic file maintenance program. After the system with its controls and the tables of values have been approved by the actuary, the daily operation becomes routine administration.

Total system design affects such a wide part of company operation that the planning function becomes a total company operation and all company planning is integrated into one department. This department requires actuarial talent in order to fit the necessary actuarial operations into the system. After the computer system is working adequately this planning department is still required for modifying or extending the system. The special abilities of this section become available for model office or other actuarial research using marginal computer time. Administration and actuarial responsibilities must be blended in this planning group in order to get most value out of the new facility.

In the Crown Life 7070 system, the master policy record contains the medial reserves, current and next year, for each segment of the policy—*i.e.*, insurance, disability, double indemnity, family income benefit, etc.—and as the policy passes through the anniversary, the ledger reserve liability account is updated at the same time as the premium is added to the revenue premium account. The aggregate reserve is a ledger liability and the monthly statement will be a true accounting product balancing to the surplus increment for the month.

We are considering the possibility of extending this computer accounting program to develop a continuous Gain and Loss statement. The present policy record includes the current year's Cost of Insurance and the program generates Death Strain summaries.

Automatic accounting which produces a continuous surplus analysis is certainly of prime interest to the actuary.

The role of the actuary is to blend his interest with that of administration in a new concept of company organization. This is more easily accomplished in a smaller company.

**MR. BEN J. HELPHAND:** Pacific Mutual has adopted a complete consolidated functions approach, a one record system with daily cycling. The administration is not under the actuary but under an administrative officer, and this has given rise to some of the problems to which section A alludes.

To justify the high cost of an electronic system a good deal of savings in clerical expense must be realized. To accomplish this in a medium size company such as ours, a large number of administrative functions have to be handled by the system. This means that the administrative officer in charge is bound to be more interested in putting new procedures on tape than in developing those areas which are of primary interest to the actuary. This naturally has caused some differences in views as to what priority should be assigned to various jobs, what audits and controls should be adopted, what statistics should be captured, etc. However, after considerable pulling and hauling the administrative officer and the actuary have arrived at a common understanding.

Under our present organizational setup all programmers are under the administrative officer. The actuarial department has a section headed by an assistant actuary which works on problems in connection with the data processing system. Actuarial technicians in this section develop design and specifications which are then turned over to the programmers for interpretation.

Under a system run by an administrative officer the actuary is faced with the problem of giving up control of his source of statistics and relying on a valuation file out of his jurisdiction for calculating reserve liabilities. Furthermore, the loss of flexibility inherent in an electronic system compounds his problems. However, an organizational setup such as ours can work effectively as long as the actuary is aware that the electronic system is primarily geared to the service and accounting functions, and the administrative officer has proper regard for the actuary's needs and responsibilities.

MR. PAUL SARNOFF: The Prudential employs both medium-scale punch-card electronic computers and large-scale tape-operated machines. The physical operation of both types of equipment is handled by a department which is the direct responsibility of an officer other than the chief actuary. The medium-scale equipment is used by another department to calculate policy values for case work. That department works closely with the actuarial staff, to at least the same extent as it did before this work was computerized. The medium-scale equipment is also used for a wide variety of actuarial calculations, such as premium rates, policy values, asset shares, and dividends. The principal actuarial application of the tape-operated equipment is to maintain Ordinary in-forces and calculate reserves. The responsibility for all aspects of the accuracy of actuarial work performed on the medium-scale computer (other than the actual operation of the equipment) is vested in the actuarial department. That department designs the programs, prepares the input, and processes and analyzes the output.

The organizational setup for the tape-operated valuation system is different from that described above for the other actuarial work in several important respects. The actual development and maintenance of the programs is conducted by a department other than the actuarial department. This arrangement is necessary because of the greater complexity of programs and programming techniques associated with highly integrated electronic computer systems.

The actuarial department is responsible for defining the general content of the programs, and for organizing test material to check that the programs are giving the desired results. In addition to analysis of test results, the actuarial department reviews portions of actual computer production selected on a systematic as well as on a random basis. Control features of the valuation system are of great importance in insuring reliability of operation, and the actuarial department administers an extensive set of controls which indicate the accuracy and consistency of the work processed. Elaborate logic and systems tests are needed because, in a computer operation, completely accurate results can be obtained only if each possible combination of conditions can be anticipated and planned for in detail. Experience has shown that, while great effort is required to plan properly for the more usual types of conditions, it is neither economical nor within our ability to provide for the less common types of conditions.

This need for complete advance planning in computer systems points up an interesting contrast with punch-card systems. Using a computer system which has passed a machinability test (demonstrating operating efficiency) ensures uniform processing rules throughout the production

cycle; however, it is not until the output is reviewed that an opportunity is afforded for systems correction or improvement. Under a punch-card system, the possibilities for operator error or nonuniform procedure are much greater, but it is also true that unusual data conditions are more quickly located and corrections or adjustments can be made more readily at the time the conditions are first detected.

Generally the number of error conditions we have encountered in computer systems is probably fewer than that experienced under card systems, but because of the volume of cases and the time lag before correction, the relative expense of their correction is probably greater. For these reasons, we make extensive efforts to reduce the possibility of the occurrence of error conditions.

The use of the computer offers a greater opportunity for control of transactions individually and by bulk totals vis-à-vis the transactions affecting the bookkeeping system. Accordingly, the comptroller's staff has been taking advantage of this opportunity for a tighter control on the processing of data throughout the company, and thus the two departments mutually assist each other in this control to an increasing extent.

Considering the operations of the Company as a whole, the computer has made relatively little impact upon the organizational setup at the departmental level, although, of course, it has had considerable effect upon the operation within departments in terms of consolidation of functions and extensions of controls.

**MR. J. CRAIG DAVIDSON:** The Confederation Life Association is also a medium-size company. We were fortunate to have had an actuary selected to install our system. However, to ensure success, the second in command of the group was a person experienced in administration. The combination of these two has worked out well.

**MR. ROBERT G. ESPIE:** I think the meat of this was highlighted by a previous speaker who spoke of the distinction between this equipment as a tool and as an item of research. Insofar as electronic data processing equipment is a tool, I do not see that it should belong in the hands of the actuary. When it comes to using this equipment, it is a management problem and not an actuarial problem. Not only do we need it for group work as well as ordinary, but we also need it for fire insurance and casualty insurance and for mortgage loan accounting. The actuary is not the man who knows all about these things. He must, of course, be consulted in those areas in which actuarial functions and actuarial results are needed, but I am sure that if we tried to put everything in his hands, we wouldn't do very well. And if we tried to give each of these departments a machine

we would be equally unwise because we would not achieve management gains. Therefore, I think the answer to this question, in a company of intermediate or major size, is wrapped up in the question: "Do you think of it as a tool for research, or do you think of it as a tool for operations?" If the answer is in the latter category, then I think it does not belong in the control of the actuary.