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U.S.S. THRESHER DISASTER: AN ACTUARIAL ANALYSIS OF SURVIVOR BENEFITS PAYABLE

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A substantial amount of survivor protection is provided by the Old-Age and Survivors Insurance system should the family breadwinner die. To emphasize the importance and extent of this protection, an analysis was made of the benefits payable to the surviving dependents of the men killed in the U.S.S. Thresher submarine disaster, which occurred about 200 miles off the coast of New England on April 10, 1963.

A total of 129 men lost their lives when the Thresher failed to surface from a deep test dive. In 86 cases survivors were left who qualified for monthly survivor benefits or lump-sum death payments. The remaining deceased (the majority of whom were young, non-married servicemen) left no qualified survivors (when a deceased insured person is not survived by an eligible spouse, the law provides that the lump-sum death payment shall be available only to the extent that burial expenses are actually paid--and there were, of course, none in these cases). Only one of these men, a civil service employee, left survivors who did not qualify for benefits because he did not have sufficient work in covered employment to have insured status. However, his survivors may qualify for benefits under the Civil Service Retirement program.

Of the 86 deceased men who left qualified survivors, 84 were survived by widows--62 of these widows had at least 1 child under age 18 in their care and 6 were expecting their first child (3 of these widows had their first child within 2 months after the disaster)--1 left only a child under age 18, and 1 left children under age 18 who were in the care of his former wife divorced. The age distribution of the widows is shown in the following table:

Age of widow	Number of widows ^{1/}	
	Total	With children ^{2/}
Total	85	69
Under 30	47	40
30-39	32	26
40-49	5	3
50 and over	1	0

^{1/} Includes one former wife divorced.

^{2/} Includes 6 widows who were expecting their first child.

The average age of the widows at the time of the disaster was about 29 years. As indicated in the foregoing table, the majority of the widows were young. Those with children in their care will be eligible to receive monthly benefits until their youngest child attains age 18, if they do not remarry. Widows who have not remarried may, upon attainment of age 62, be eligible for aged widow's benefits.

In total, there were 171 children who qualified for immediate monthly benefits as a result of the disaster. In addition, 7 children were born posthumously and also qualified for benefits. There was an average of 2.5 child beneficiaries per family with children under age 18. About half the children awarded benefits were under 5 years of age and some 80% were under 10 years of age, as can be noted from the following table:

Age of child	Number of children
Total	178
0-4 ^{1/}	92
5-9	53
10-14	25
15-17	8

^{1/} Includes 7 children born posthumously.

For most of the beneficiary families, monthly survivor payments will be an important source of income. The amounts of family benefits awarded varied depending on the number of children in the surviving family and the primary insurance amount of the deceased worker. Seventy-one deceased men left qualified survivors eligible for immediate monthly benefits. These survivors consisted of 62 widows with at least one eligible child at the time of the disaster, 6 widows with an eligible child born posthumously, a former wife divorced with eligible children, a surviving child only, and a surviving child whose mother did not qualify for a mother's benefit because she did not have the child in her care (she may qualify for an aged widow's benefit upon attainment of age 62). The average primary insurance amount for these 71 men was \$93. The monthly amount of family benefits awarded for immediate payment varied as follows:

Monthly amount	Number of families
Total	71
Under \$100	7
100-149.90	16
150-199.90	21
200-253.90	12
254	15

Women who will qualify for widow's benefits at age 62 may expect to receive about \$76, on the average (disregarding such factors as failure to qualify because of death or remarriage, or failure to qualify for full benefits because of entitlement to an old-age benefit based on her own earnings record).

In this actuarial analysis of the benefits payable as a result of the disaster, two calculations were made. In one, an estimate was made of the aggregate amount of benefits "expected" to be paid in the future under certain assumptions. Here, no account was taken of the fact that funds not required for the payment of benefits until some future date can be invested at interest. In the second calculation, the "present value" of the aggregate amount "expected" to be paid in the future was determined. By "present value" is meant the lump-sum amount which, if invested at an assumed rate of interest--3 1/4% was used in these calculations--would be exactly sufficient to finance all "expected" future payments as they arise. Thus, in this instance, the present value may be looked upon as the amount of OASI life insurance in force on the lives of the victims at the time of the disaster.

The contingencies of mortality and remarriage were taken into account for the widows; the computations were based on United States White Female mortality for 1949-51 and OASDI remarriage experience for 1956. Tables combining the 1956 remarriage rates with more recent mortality rates were not readily available. Their use, however, would not substantially improve the accuracy of the results since termination rates among widows are determined primarily by the remarriage factor. For child beneficiaries, the mortality factor was disregarded because death rates for young children are very low. All benefits were considered, including the deferred benefits payable to widows at age 62. No allowance was made, however, for possible withholding of, or reduction in, benefits because of the beneficiary's covered employment or because of the receipt by an aged widow of an old-age benefit in her own right. On this basis, the "expected" benefit payments to the survivors of the disaster total about \$2,261,000, and the present value of these payments is about \$1,672,000. These amounts are distributed by type of benefit in the following table (in thousands):

Type of benefit	"Expected" payments	Present value
Total	\$2,261	\$1,672
Mother's and child's ..	1,942	1,558
Widow's	299	94
Lump-sum ^{1/}	20	20

^{1/} Lump-sum death payments were made only to surviving widows. No reimbursement for burial expenses was made on the basis of equitable entitlement.

The present value of "expected" benefit payments to all survivor families averaged about \$19,450 per family. For families consisting of a surviving widow and one or more children, the average was about \$23,490; for all other family groups, the average was \$4,180.

As mentioned previously, these figures do not allow for possible withholding of, or reduction in, benefits that would particularly affect widow's and mother's benefits (and to a much lesser extent, child's benefits). However, in cases where the maximum family benefits apply, the withholding of mother's benefits because of the widow's employment would be partially or fully offset by an increase in the child's benefits. A further offsetting factor would occur, if as a result of future legislation, benefit levels are increased.

As an illustrative case to show how much insurance protection the program provided in a "typical" case, a family consisting of a widow with two children under age 18 in her care was chosen. In this "typical" family, the widow was age 29 and the children were aged 4 and 7. The deceased worker had a primary insurance amount of \$95. Until the oldest child attains age 18, each beneficiary will have a benefit of \$67.50 a month. After this, the benefit of the widow and youngest child will be \$71.30 a month each until the child attains age 18. These amounts are payable as long as the three beneficiaries do not engage in substantial employment, the widow does not remarry, and the children do not marry. If the widow should remarry during this time, her monthly benefit would terminate, but the children would continue to be eligible. When the unremarried widow attains age 62, she will receive a benefit of \$78.40 a month, assuming of course, that she has not become eligible for an old-age benefit in her own right based on her own employment (in which case she receives, in effect, the larger of the two benefits).

The "expected" benefit payments and the present value of these payments may be calcu-

lated for this family, as they were for the entire group. The same assumptions used for the group as a whole were applied to this particular case. For this family, the "expected" benefits payable amount to \$29,385, and the present value of these payments is \$22,625. These totals, distributed by type of benefit, are as follows:

Type of benefit	"Expected" payments	Present value
Total	\$29,385	\$22,625
Mother's and child's ..	25,785	21,490
Widow's	3,345	880
Lump-sum	255	255

Although a disaster such as the Thresher case is rare, it provides a striking example of the protection afforded by the Old-Age and Survivors Insurance program to surviving dependents of deceased workers. At the beginning of 1963, about 91 million workers had survivors insurance protection under the program, and almost 3 million families in which the wage earner had died were receiving monthly survivor benefits.