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ARKANSAS TITAN II MISSILE SITE DISASTER: AN ACTUARIAL ANALYSIS OF SURVIVOR BENEFITS PAYABLE

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One of the basic functions of the old-age, survivors, and disability insurance program is to provide benefits to the survivors of deceased covered workers. The importance of such benefits is vividly displayed when an area suffers a major disaster, such as the Titan II missile site fire, which occurred near Searcy, Arkansas on August 9, 1965. What the benefits will mean in financial terms to the survivors of this disaster is shown in the following actuarial analysis of the benefits awarded. In summary, about $1½ million in benefits will be paid over the future to the survivors.

As a result of the fire, 53 men, all of whom were civilians, lost their lives. All the deceased had enough quarters of coverage to have survivors insurance protection. The ages of the deceased ranged from 21 to 69, and they all were married.

Benefits Payable

Of the 53 surviving widows, 33 became entitled to monthly benefits because they had at least 1 child under age 18 in their care, and 3 were awarded monthly aged widow's benefits, 2 of whom elected to receive reduced widow's benefits under the provision of the 1965 Amendments which permits payment of actuarially-reduced benefits to widows aged 60–61. The age distribution of the widows is shown in the following table:

Age of widow	Number of widows	
	Total	With children under 18 in their care
Total	53	33
Under 30	6	5
30–39	12	11
40–49	18	13
50–59	12	4
60–69	5	0

The average age of the widows at the time of the disaster was 44 years. Those with children in their care will be eligible to receive monthly benefits until their youngest child attains age 18, or longer if a child becomes disabled before age 18, unless the widow remarries. Upon attainment of age 60, a widow may be eligible for an aged widow's benefit.

There were 72 child's monthly benefits awarded as a result of the disaster. Included in these 72 awards were benefits to 67 children under age 18 (one born posthumously after the disaster), 4 student children aged 18–21 under the provision of the 1965 Amendments which provides for payment of benefits to children in this age group who are in full-time school attendance, and 1 to a disabled child aged 25 whose disability occurred prior to age 18. There were, on the average, 2.1 child beneficiaries per family for families in which there was at least 1 child awarded a monthly benefit. The age distribution of these children is as follows:

Age of child	Number of children
Total	72
0–4	12
5–9	10
10–14	26
15–17	19
18–21	4
22 and over	1

Lump-sum death payments were made on behalf of all the deceased men. All but 2 of these payments were at the $255 maximum. The amount of family benefits awarded varied depending on the number of children in the surviving family and on the primary insurance amount of the deceased worker. The distribution of the 37 families with survivors entitled to immediate monthly benefits, was as follows: 33 widows with at least one eligible child at the time of the disaster, 3 aged widows, and 1 beneficiary family consisting of a student child (the mother is not eligible for monthly benefits solely on the basis of a student child's entitlement to benefits, but may qualify for an aged widow's benefit upon attainment of age 60). The average primary insurance amount for the 37 workers was $116.60. The monthly amount of family benefits awarded varied as follows:

Monthly amount	Number of families
Total	37
Under $100	3
100–149.90	7
150–199.90	6
200–249.90	6
250–299.90	10
300–306.00	5

All but one of the widows may qualify for an aged widow's benefit at age 60 (one of the deceased men was currently insured only; although his widow qualified for a mother's benefit because she has a child beneficiary under age 18 in her care, she will not qualify for an aged widow's benefit on his earnings record upon attainment of age 60).

Valuation of Benefits

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 – 3½% 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.

To illustrate the effect of the school attendance provision, two separate calculations were made in the valuation of mother's and child's benefits. In one, no allowance was made for the contingency of full-time school attendance for child beneficiaries attaining age 18 (student child benefits were, however, taken into account in this calculation for the 4 children aged 18–21 who were awarded student child's benefits). In the second calculation, full-time school attendance during ages 18–21 was assumed for all child beneficiaries attaining age 18. In both calculations, termination of child's benefits because of mortality or marriage before age 22 was disregarded. The termination of benefits because of mortality or remarriage was taken into account for the widows; the computations were based on female mortality experience in the United States during 1959–61 and OASDI remarriage experience. All benefits were considered, including the deferred benefit payable to aged widows. However, possible entitlement to benefits on the earnings record of the spouse killed in this disaster was disregarded in the event of the widow's remarriage after age 60.

Under the above assumptions, the "expected" benefit payments and the present value of these payments to the survivors of the disaster are shown, by type of benefit, in the following table (in thousands):

Type of benefit	"Expected" payments		Present value	
	With school attendance	Without school attendance[1]	With school attendance	Without school attendance[1]
Total	$1,631	$1,402	$1,094	$931
Mother's and child's	956	727	756	593
Widow's	662	662	325	325
Lump-sum	13	13	13	13

1/The estimates in this column take into account monthly benefit payments to children aged 18–21 attending school for those children awarded an immediate monthly student child benefit, but not for those under age 18 at time of award.

The average "expected" benefit payments and average present value of these payments for survivor family groups are as follows:

Type of group	Average "expected" payment		Average present value	
	With school attendance	Without school attendance[1]	With school attendance	Without school attendance[1]
All families	$30,770	$26,470	$20,640	$17,570
Surviving widow and one or more children under age 18	38,620	31,700	26,810	21,880
All other family groups	17,820	17,820	10,470	10,470

1/See footnote 1 in preceding table.

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 could be partially or fully offset by an increase in the child's benefit. The computations, of course, are made on the basis of the benefits provided under the 1965 Amendments and do not consider the possible effects of future legislation.

A "Typical Family"

To illustrate how much insurance protection the program provides for a "typical" mother-child family, a family consisting of a widow aged 33 with two children in her care, aged 11 and 15, was chosen. The deceased worker had a primary insurance amount of $128.40, and each beneficiary was awarded a benefit of $96.30 a month. When the widow attains age 60, if she has not remarried, she will be eligible for an actuarially-reduced aged widow's benefit of $91.90 a month. If she waits until age 62, she will be eligible for an unreduced benefit of $106.00 a month, assuming 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 calculated for this family, as they were for the entire group. The same assumptions used for the group as a whole were applied to this illustrative case. The totals, distributed by type of benefit, are shown in the following table:

Type of benefit	"Expected" payments		Present value	
	With school attendance	Without school attendance[1]	With school attendance	Without school attendance[1]
Total	$33,730	$24,485	$25,075	$17,780
Mother's and child's	26,565	17,320	23,010	15,715
Widow's	6,910	6,910	1,810	1,810
Lump-sum	255	255	255	255

1/See footnote 1 on preceding page.