Tennessee Valley Authority Retirement Plan: Coordination With Old-Age, Survivors, and Disability Insurance

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With the approval of the Tennessee Valley Authority's plan coordinating its staff retirement system with old-age, survivors, and disability insurance, that agency's staff now has protection similar to that of many workers in private industry. An analysis of the coordinated plan is presented in the following pages.

COVERAGE of employees of the Federal Government under the old-age, survivors, and disability insurance system is in general restricted to those who are not covered by an existing staff retirement system.[1] Because of the broad coverage of the civil-service retirement system and because of the existence of a number of small plans, coverage of the general social insurance system is therefore primarily applicable only to those Federal employees who have temporary jobs. One important exception, however, has been made for certain employees of the Tennessee Valley Authority. These employees, under the provisions of the Social Security Amendments of 1956, have coverage under both old-age, survivors, and disability insurance and a separate supplementary system of their own. The legislative background of this development is described in the following pages, and a comparison made of the present coordinated system and the plan as it was previously.

Background

The Tennessee Valley Authority is a Government corporation created by an act of Congress in 1933. The chief functions of this agency are, in general, to bring about the complete and adequate development of the Tennessee River system through the construction of dams, which are used both for flood-control and navigation purposes and for the creation of electric power. It also conducts closely related programs of water control and of conservation, which includes research into new types of fertilizers for use in agricultural programs.

The personnel of the Tennessee Valley Authority is employed under a merit system authorized by the enabling legislation. The number of employees has varied considerably, depending upon the amount of construction activity. In general, the employees may be divided into two groups—the "construction workers" and the "maintenance and operations workers," who also include technical staff and administrative and policy-making officials. The former group is employed at hourly rates of pay, and the latter is paid on an annual basis. Since 1950 the number of maintenance employees has been at a level of about 12,000, and the number of construction workers has fluctuated from a minimum of roughly 3,000 to a maximum of about 11,700.

Under the authority of the initial legislation establishing the Tennessee Valley Authority, a separate retirement system was developed for the maintenance and operations employees in the late 1930's and went into effect in 1939; in the middle of 1940, about 5,800 workers were covered. The management and the employees jointly administer this system, which is financed partly by employee contributions and partly by agency funds, which come both from appropriations from the General Treasury of the United States and from earnings arising from the operations of the Authority. This retirement system covers all maintenance and operations workers except temporary and part-time employees and the relatively small group of persons (about 350 in July 1957) who transferred from other Government agencies and who, at the time of the transfer, were under the civil-service retirement system. Under such circumstances, an employee continues to be covered under that program.

Legislative Developments

The Tennessee Valley Authority retirement system does not cover construction workers. Their employment is usually intermittent and temporary, and coverage under a staff retirement system is not feasible or meaningful. For a large proportion of the TVA employees who had formerly worked in jobs covered by old-age and survivors insurance, their earlier coverage had diminishing value since their TVA service was not covered. For the Authority, the absence of coverage under the Social Security Act was a considerable handicap in recruiting personnel. A provision for coverage of the TVA construction workers was included in a bill containing a number of amendments to the old-age and survivors insurance program that passed the House of Representatives in 1948 but was not acted upon by the Senate. Their coverage would have paralleled the action taken by Congress in covering similar employees of the Bonneville Power Administration in 1945.[2]

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[1] The Social Security Act provides old-age, survivors, and disability insurance coverage for employees of certain instrumentalities of the Federal Government who are also covered by staff retirement systems—employees of Federal credit unions, Federal Reserve Banks, national farm loan associations, and post exchanges operated by the Armed Forces. Under a strict interpretation, these individuals are not Federal employees.

[2] Public Law No. 201, Seventy-ninth Congress.

The need for basic social insurance protection for these workers was recognized by Congress in the Social Security Act Amendments of 1950. The executive branch of the Federal Government directly recommended the legislation and representatives of the employees involved supported it at the congressional hearings.

The 1950 amendments also provided coverage, at the election of the State, for the many State and local government employees who were not under retirement systems. In general, however, coverage was not permitted for employees with that protection. Within a short time a number of States sought the coverage of the Federal program for their employees under retirement systems, with the intention of revising the plans to make them supplementary to the general program. The Social Security Amendments of 1954 included elective provisions for coverage of almost all State and local government employees already under retirement systems.

At the time of the 1954 legislation the executive branch of the Federal Government also recommended compulsory coverage of employees of the Tennessee Valley Authority who were under its retirement system. The action was strongly supported by the Authority at the congressional hearings, and it also had the support of the employee unions representing the members of the system. The reasons were the same as for their support of the 1950 extension to employees not under the retirement system—that is, to provide continuous coverage and to lessen recruitment problems. The bill passed by the House of Representatives provided for such coverage, but the provision was eliminated in the Senate on the grounds that "it was thought unwise to . . . afford Federal employees overlapping benefit rights under old-age and survivors insurance as well as under another Federal retirement system." [3]

In 1955 the House of Representatives again included provision for compulsory coverage of TVA employees in its bill to amend the Social Security Act. Once again, the Senate eliminated the provision, with the committee report stating the belief that "social security coverage should not be extended to them until there is further evidence that the resulting total benefit amounts would not be excessive." [4] The House-Senate conferees then developed a compromise provision that was accepted by both

Table 1.—*Provisions of Tennessee Valley Authority retirement system, before and after coordination with old-age, survivors, and disability insurance*

Item	Former plan	Revised plan
1. Retirement age:		
a. Normal	65	65.
b. Compulsory	70	70.
c. Early	60	None (see item 3).
2. Amount of retirement benefit:		
a. Annuity (from employee contributions).	Actuarial equivalent of employee's contributions (accumulated at interest).	Same.
b. Pension (from employer)	For retirement at age 65 or over, 1% of average salary for highest 5 consecutive years times years of service; for retirement at ages 60–64, factor of ¾% is used (instead of 1 percent).	1% of high-5-year average salary times years of service, less ½% of such wage not in excess of $4,200, times years of service after 1955 not in excess of 30.
c. Optional benefits	Reduced benefit providing for cash-refund annuity, or for joint-and-survivor allowance.	Same.
3. Withdrawal benefit:		
a. Less than 10 years of service (reduced to 5 years for involuntary separation without cause).	Refund of accumulated employee contributions.	Same.
b. 5 or more years of service and involuntary separation without cause.	Refund as above, or a deferred benefit at age 60, in amount as in item 2b (based on ¾% factor for pension), or an immediate benefit actuarially reduced.[1]	Refund as above, or a deferred benefit at 65, in amount as in item 2b, or an immediate benefit actuarially reduced.[1]
c. 10 or more years of service and voluntary separation or involuntary with cause.	Same as above, except that reduced benefit not payable before age 55.	Same.
4. Disability benefit:		
a. Eligibility conditions	5 years of service; permanent and total disability for usual occupation.	Same.
b. Amount of benefit	1.35% of high-5-year average salary times years of service (inclusive of annuity purchased from employee contributions).	1.35% of high-5-year average salary times years of service, less benefit payable under item 3b.
c. Minimum benefit	25% of average salary, unless 1.35% times years of service if employed until age 60 is less.	For total of withdrawal and disability benefits, 25% of average wage, unless 1.35% times years of service if employed until age 65 is less.
d. Restriction on payment		Not payable before age 65 if equal or larger disability benefit payable under OASDI. After age 65, benefit reduced by 50% of old-age benefit payable under OASDI.
5. Death benefit (before retirement).	Lump sum [2] of (1) accumulated employee contributions and (2) amount equal to average annual salary in last year (latter amount reduced by 50% if less than 10 years of service).	Same.
6. Financing:		
a. Employee contributions	Varying by sex and age at entry [3]	Varying by sex and age at entry; employee may elect reduction of 2% on first $4,200 of salary.[4]
b. Employer contributions	Balance required to maintain system on a funded basis, with unfunded accrued liability being liquidated.	Same.
c. Funding medium	Trusteed plan, with investments in Government and other bonds, common and preferred stocks, mortgages, and real estate.	Same.

[1] Under previous plan, these benefits were not payable to persons retired for disability, who received disability benefits instead; under present plan, these benefits are payable to disability retirants, who also may receive the modified, reduced disability benefits.

[2] Lump sum may be converted to an actuarially equivalent life annuity for the beneficiary.

[3] Variations have also arisen for entrants at different periods in the past.

[4] Present rates for male new entrants (before optional 2% reduction on first $4,200) range from 5.18% at age 20 to 8.14% at age 55 (5.95% and 9.36%, respectively, for women).

[3] Senate Report No. 1987, Eighty-third Congress, page 10.

[4] Senate Report No. 2133, Eighty-fourth Congress, page 13.

Houses and became part of the Social Security Amendments of 1956 (Public Law No. 880). Under its terms, coverage could be extended to the group if a plan for coordination of the TVA staff retirement system and old-age, survivors, and disability insurance was submitted to the Secretary of Health, Education, and Welfare and approved by him before July 1, 1957. In such circumstances, coverage could be made effective at the beginning of any calendar quarter in 1956 or at the beginning of any of the first 3 calendar quarters of 1957, at the option of the Authority. The law prescribed that the plan would have to provide "coordination, on an equitable basis, of the benefits provided by the retirement system applicable to such employees with the benefits provided by title II of the Social Security Act."[5]

Provisions of Plan

Under the coordinated plan the employees covered by the TVA retirement system are covered under old-age, survivors, and disability insurance in the same manner as are the employees in private industry. They pay the employee contributions scheduled in the law, and the Authority pays the matching employer contributions.

The TVA retirement system was suitably modified to reflect coverage and benefits under old-age, survivors, and disability insurance. The provisions of this retirement system, as they existed before the coordination and as they are now, are summarized in table 1.

Table 2.—*Characteristics of individuals in sample*

Individual	Sex	Year of entry	Age at entry [1]	Salary rate, Jan. 1, 1956	Contribution rate (percent) [2]	Accumulated contributions [3]
1	M	1952	21	$3,555	4.43	$455
2	F	1941	45	3,700	10.20	4,061
3	M	1953	21	4,360	4.43	324
4	M	1952	25	3,690	4.60	551
5	M	1943	29	3,460	5.16	1,681
6	M	1953	31	4,190	4.94	477
7	M	1942	32	4,650	5.78	2,609
8	F	1951	49	4,825	7.47	1,630
9	M	1947	25	7,820	4.70	2,424
10	M	1953	28	3,555	4.75	350
11	M	1951	53	5,112	7.17	1,434
12	M	1952	20	3,365	4.39	590
13	M	1945	35	5,745	5.60	2,871
14	M	1951	27	4,865	4.70	791
15	M	1953	34	3,980	5.16	434
16	M	1938	24	4,225	5.13	2,858
17	M	1935	35	9,000	6.58	8,707
18	F	1933	34	4,225	12.03	6,027
19	M	1947	40	7,105	5.79	3,147
20	M	1953	40	5,090	5.69	643

[1] Age nearest birthday at entry into TVA employment.
[2] Rates actually payable by the various individuals, not identical with published figures for rate schedules in effect at various past dates since they include, in most instances, additional contributions to increase the annuity (purchasable with employee contributions) to bring it more nearly to the level of the pension based on the high-5-year salary (as contrasted with the basis in effect up to July 1949—the high-10-year salary). In certain instances, the rate is relatively high because it includes an additional contribution for past service credit.
[3] As of Dec. 31, 1955.

Under the former plan, the retirement benefits payable at age 65 were intended to represent about 2 percent of the average salary in the worker's 5 consecutive years of highest earnings. The part coming from the employer (designated the "pension") was exactly half this amount. The amount actuarially purchasable from the employee's accumulated contributions (called the "annuity") was intended to make up the other half, but this exact result was not always achieved. The employee contribution rate was designed to produce an annuity equal to the pension under the assumption of (1) a particular future salary scale, (2) a given interest rate to be used in accumulating the contributions, and (3) a certain purchasable annuity factor for each age at retirement. Thus, if the actual earnings experience resulted in a progression different from that in the theoretical scale, or if the actual interest rate credited differed from the assumed rate, or if the actual mortality experience for retirants varied from that anticipated so that new rates were adopted, the desired result—an annuity approximately equal to the pension—was not achieved. In actuality, only the first of these factors has had such an effect.

On October 5, 1956, the Chairman of the TVA's Board of Directors submitted a plan that provided for coverage of employees in service on the approval date, effective retroactively to January 1, 1956. This plan was approved on December 28, 1956, by the Secretary of Health, Education, and Welfare, who reported his action to Congress on July 23, 1957. (The law required that such a report be submitted before August 1, 1957.)

Under the revised plan, the retirement benefit formula is changed so that the goal is a total benefit (pension plus annuity) of 2 percent of the average salary for the highest 5 consecutive years for each year of service, less 1 percent of the first $4,200 of such salary times years of service not to exceed 30.[6] The reduction applies only to service after 1955 and is intended to approximate the primary insurance amount under old-age, survivors, and disability insurance for those with 30 or more years of service. (For an individual earning $4,200 a year, the "primary insurance amount" of $108.50 a month is 31 percent of salary.)

Accordingly, in the long run there is a complete offset of the old-age, survivors, and disability insurance benefits against the full benefits formerly provided under the staff retirement system. The offset is relatively small, however, for employees retiring in the near future, because it affects only years of service after 1955. Reasonably adequate benefits can thus be paid to persons in this group, who cannot possibly have had a full working lifetime of coverage under the staff retirement system (since the Authority did not begin operations until 1933) and whose

[5] Identical provisions for coverage of the roughly 200 employees of the 11 Federal home loan banks, which have their own retirement system, were contained in the 1956 amendments; they had also been part of the 1954 bill. Before the deadline of July 1, 1957, the Federal Home Loan Bank Board had submitted two coordination plans for the employees of the Federal home loan banks for consideration by the Secretary of Health, Education, and Welfare, but neither was approved. Both plans would have been fully additive, since they would have extended coverage under the Social Security Act to such employees without modifying the existing retirement system. The first plan would also have permitted each of the 11 banks separate options to participate—a provision not made in the law. Although the second plan eliminated that feature, its fully additive arrangement was not approved since it did not represent "coordination, on an equitable basis"; it would have resulted in markedly higher total benefits than are generally provided for other Federal employees and for nongovernmental employees under private pension plans that supplement old-age, survivors, and disability insurance.

[6] The pension (from the employer) provides exactly half the amount stated in this formula. The annuity purchasable by the employee, assuming that he elects to reduce his contribution rate to take into account his social security contributions, is intended to closely approximate the pension.

benefits under that system would necessarily be relatively small.

The disability benefits under the retirement system were realigned to reflect both the availability of disability benefits payable under the Social Security Act and the provision for offsetting any other Federal disability benefits against them. Under the revised retirement system, a person leaving the Authority because of disability will receive a disability pension supplementary to the actuarially reduced withdrawal benefit to which his service entitles him unless it is less than the disability benefit payable under the old-age, survivors, and disability insurance system; in that event, no disability pension will be payable under the staff retirement system. When the amount payable under the staff system is the larger of the two disability benefits, only that benefit is paid.

The employee contribution rate under the TVA retirement system varies according to the worker's sex and age at entry. The rate structure has been revised several times to reflect changes made in the provisions of the system and variations in the actuarial experience. Under the revised system, the individual may elect to reduce his contributions by 2 percent of the first $4,200 of annual earnings. This option recognizes the increased cost to the employee resulting from the old-age, survivors, and disability insurance contributions, which — although now 2¼ percent and scheduled to rise to 4¼ percent by 1975—were 2 percent of earnings when the plan was developed and during the first year of coverage. Thus, even though the individual elects this reduction, he is now paying slightly more in the aggregate than previously, and he will pay even more in the future. For this additional cost, however, he receives the advantage of such additional protection as the availability of benefits under the general system for dependents of retired workers and for survivors of deceased workers, including those who die after retirement.

The cost to the TVA, as employer, is also increased somewhat—by a small amount at present but by more in the future. This higher cost is a result not only of the improved protection afforded all employees but also the considerably larger total benefit protection that will be available for persons who retire in the near future.

At present, the amount payable by the TVA as employer is about 6.4 percent of membership payroll for the revised, supplementary plan. In addition, the contribution of 2¼ percent on the first $4,200 of salary for old-age, survivors, and disability insurance is equivalent to about 1.8 percent of such payroll, making a total employer cost of 8.2 percent.

Before the revised plan was developed, the employer cost was about 8.0 percent of payroll. The financing basis was planned to maintain approximately this total cost for the combined effect of the revised plan and the then-existing 2-percent contribution rate under the Social Security Act. The latter is actually equivalent to about 1.6 percent of total payroll. The balance of the 8.0 percent—about 6.4 percent—was thus available for the revised plan and was the cost to the Authority for the fiscal year 1956–57.

In summary, then, the cost to the Authority for the revised plan and for old-age, survivors, and disability insurance combined is approximately 8¼ percent of payroll at the present time. In the future, this cost will tend to rise as the old-age, survivors, and disability insurance contribution rate increases according to the schedule in the law. If the cost of the TVA supplementary plan remains at roughly the present amount—6½ percent of payroll—the ultimate combined cost to the Authority will be about 10 percent of payroll.

This cost is well below the cost to the Federal Government for other retirement systems, which do not supplement old-age, survivors, and disability insurance. Under the civil-service retirement system, for example, the normal cost to the Government is about 7 percent of payroll; the unfunded accrued liability cost of somewhat more than 6 percent brings the total employer cost to more than 13 percent. In actual operation, each Government agency contributes 6½ percent of payroll (matching the employee contribution), which, as it happens, closely approximates the normal cost; the balance of the employer cost has to be met from general funds. One reason that the cost is relatively higher for the civil-service retirement system than for the TVA system is that the former is older; in addition, Congress did not always make full appropriations for the normal employer cost of the civil-service program and for amortizing the unfunded accrued liability.

Illustrative Benefits

The survivor protection of persons covered by the TVA retirement system is greatly enhanced under the coordinated system. With respect to retirement benefits, however, the coordination was designed to produce about the same total benefits for those retiring after a lifetime under the system (if the availability of dependents' benefits is not taken into account), but somewhat larger total benefits for those retiring in the near future.

During the congressional development of the legislation, concern had been expressed that, on the one hand, some individuals might receive less under the coordinated plan than under the existing one and that, on the other hand, some individuals might receive excessive increases. Considerable interest was expressed in obtaining information for specific individuals rather than merely for hypothetical cases. It was proposed that 20 actual cases be selected and that computations be made on both bases—the existing plan and the proposed coordinated plan. For this purpose, from the entire group of covered persons selection was made of the first 10 whose names started with the letter *A* and the first 10 whose names started with the letter *M*.

Table 2 gives various statistical data on the 20 individuals in the sample. It can be seen that the sample contains a reasonably good distribution according to the various factors involved—sex, year of entry into TVA employment, age at entry, and salary rate.

Table 3 shows, for each individual in the sample, the annual benefit that would be paid under the former plan if the individual continued in service until the end of the calendar year in which his sixty-fifth birthday occurred and if his salary remained the

Table 3.—***Illustrative annual benefits for individuals in sample, former plan, under assumption of level future earnings***

Individual	Total benefit income		Annuity [1]		Pension [2]
	No death benefit	With death benefit	No death benefit	With death benefit	
1	$3,435	$2,949	$2,013	$1,527	$1,422
2	1,502	1,349	737	584	765
3	4,199	3,606	2,455	1,862	1,744
4	3,290	2,852	1,814	1,376	1,476
5	2,609	2,289	1,326	1,006	1,283
6	3,095	2,699	1,639	1,243	1,456
7	3,072	2,703	1,526	1,157	1,546
8	1,480	1,331	716	567	764
9	6,647	5,797	3,519	2,669	3,128
10	2,868	2,495	1,547	1,174	1,321
11	1,328	1,169	659	500	669
12	3,325	2,848	1,979	1,502	1,346
13	3,504	3,078	1,766	1,340	1,738
14	4,134	3,594	2,232	1,693	1,902
15	2,726	2,377	1,446	1,097	1,280
16	3,403	2,979	1,755	1,331	1,648
17	4,951	4,417	2,213	1,679	2,738
18	2,671	2,391	1,347	1,067	1,324
19	3,737	3,282	1,884	1,429	1,853
20	2,665	2,336	1,363	1,034	1,302

[1] Benefit purchasable with the employee's accumulated contributions. The employee can choose to have either no death benefit after retirement, and thus a larger annuity, or a cash-refund benefit (lump sum paid at death equal to the excess, if any, of accumulated contributions at time of retirement over total annuity payments received).

[2] Benefit provided by the Tennessee Valley Authority as employer.

same as at the beginning of 1956. The benefit was composed of two parts—(1) a "pension" from the employer amounting to 1 percent of final salary (actually, the average of the highest 5 consecutive years) for each year of service and (2) an "annuity" representing the amount purchasable on an actuarial equivalent basis by the employee's accumulated contributions. The contribution rates were, and are, based on the worker's age at the time he becomes a member of the plan so that, with normal salary trends, the annuity approximated the pension. Unless the individual elected otherwise, the annuity carried no death benefit after retirement; the individual, however, could exercise the cash-refund option, providing for a smaller annuity with a death benefit equal to the excess (if any) of the accumulated employee contributions at the time of retirement over the total annuity payments made. Most private pension plans have some type of death benefit after retirement that guarantees to the employee at least the return of his contributions. It therefore seems worthwhile to consider both types of death-benefit options for the annuity under the TVA plan. Actual experience shows that about two-thirds of the retirants take the automatic option, with no death benefit, and the other third elect a smaller annuity and so provide a death benefit for their survivors.

The table indicates that in most cases the annuity with no death benefit was somewhat larger than the pension and that the annuity with a death benefit tended to be less than the pension. The annuity tended to be larger than the pension when the automatic option was exercised partly because the illustrative benefits assume level future earnings and the contribution rates developed assume a somewhat increasing salary scale.

The data in table 4 are similar to those in table 3 except that they relate to the amended plan. Both the annuity and the pension are considerably reduced from the amounts under the former plan since they are intended to be coordinated with old-age, survivors, and disability insurance. The pension for future service is based on only ½ of 1 percent of the first $4,200 of earnings (rather than 1 percent), and the contributions on which the annuities are based are reduced so that, in consequence, the annuity too is smaller.

Table 5 presents data on which the main portion of the analysis is based —total benefits as a percentage of average earnings under both the former plan and the amended plan, for each individual in the sample. When the automatic option of no death benefit is used, under the former plan the ratio of benefits to earnings is more than 90 percent for three individuals who entered service at a relatively young age and who will have had many years of service by the time they retire. On the other hand, some ratios are as low as 30 percent when the individual entered service at a relatively old age and thus could not obtain many years of service before retirement. The percentages around 90 are not completely realistic because of the assumption of level future earnings.

The main purpose of table 5, however, is to provide comparative data for the same individual under the plan before it was amended and under the revised plan. When this comparison is made, it will be seen that

Table 4.—***Illustrative annual benefits for individuals in sample, amended plan, under assumption of level future earnings***

Individual	Total benefit income		Annuity [1]		Pension [2]	OASDI benefit [3]
	No TVA death benefit	With TVA death benefit	No TVA death benefit	With TVA death benefit		
1	$3,278	$2,984	$1,217	$923	$889	$1,172
2	2,545	2,402	689	546	654	1,202
3	3,883	3,529	1,467	1,113	1,114	1,302
4	3,260	2,985	1,138	863	922	1,200
5	3,007	2,765	1,003	761	851	1,153
6	3,177	2,924	1,050	796	827	1,300
7	3,673	3,373	1,245	945	1,126	1,302
8	2,440	2,314	605	479	533	1,302
9	6,728	6,021	2,928	2,221	2,498	1,302
10	2,922	2,690	960	728	788	1,174
11	2,342	2,206	560	424	480	1,302
12	3,202	2.906	1,226	930	841	1,135
13	4,106	3,747	1,486	1,127	1,318	1,302
14	4,112	3,740	1,539	1,167	1,271	1,302
15	2,887	2,658	946	717	683	1,258
16	3,833	3,498	1,387	1,052	1,144	1,302
17	5,930	5,423	2,100	1,593	2,528	1,302
18	3,698	3,435	1,261	998	1,135	1,302
19	4,419	4,023	1,642	1,246	1,475	1,302
20	3,139	2,894	1,018	773	819	1,302

[1] Benefit purchasable with the employee's accumulated contributions. The employee can choose to have either no death benefit after retirement, and thus a larger annuity, or a cash-refund benefit (lump sum paid at death equal to the excess, if any, of accumulated contributions at time of retirement over total annuity payments received).

[2] Benefit provided by the Tennessee Valley Authority as employer.

[3] Excludes any supplementary benefits for dependents.

in almost all cases the amended plan gives at least as large a benefit in relation to the average earnings as did the former plan. For those with relatively short service, both past and future, the amended plan shows considerably increased benefits because of the addition of the old-age, survivors, and disability insurance benefit, which is not directly related to length of coverage.

Thus, the individuals whose benefits represented about 30 percent of average earnings under the former plan receive about 50 percent under the amended plan—a reasonable increase. Those with benefits representing more than 30 percent of earnings under the former plan receive proportionately smaller increases under the amended plan, until for those with the highest amounts there is substantially no increase. In fact, on the assumption that there is no TVA death benefit, for four individuals (numbers 1, 3, 4, and 12) the benefit proportion under the amended plan, although substantial, is somewhat lower than under the former plan. When the comparison is made for these individuals on the assumption that a death benefit after retirement is elected, this situation no longer prevails for three of the four individuals and is present to only a slight extent for the remaining one.

Further analysis of the benefits of the four individuals was made by considering the more realistic possibility of a salary scale increasing at an assumed rate of 2 percent compound per year. The following tabulation shows the benefit proportions that result from these assumptions.

Individual	With no TVA death benefit		With TVA death benefit	
	Former plan	Amended plan	Former plan	Amended plan
1	75.1	71.8	66.7	66.2
3	74.9	71.6	66.5	65.7
4	72.1	70.9	64.4	65.6
12	76.1	72.7	67.4	67.0

It will be noted that the benefits are a much lower proportion of average earnings than those previously given. The extremely high ratios based on future level earnings will not actually develop. Salaries will no doubt rise because of the normal periodic in-grade increases provided for some employees on the TVA salary basis, and they are also likely to rise because of the practice of following changes in the general wage level. Thus, in all four cases, when there is no death benefit after retirement, the benefit proportions are about 70–75 percent rather than about 90–100 percent as shown in table 5. If the death benefit after retirement is elected, the percentages under the realistic basis of an increasing salary scale are about 65 percent. As when the level-earnings basis is used, the proportions are slightly lower under the amended plan than under the former plan if no death benefit after retirement is elected, but the differences are considerably reduced in two cases (and remain about the same in the other two cases) from the amounts shown in table 4. If a death benefit after retirement is elected, and the assumption of increasing salary is used, the benefit proportions under the amended plan are virtually identical with those of the former plan.

In summary, this analysis of a sample of 20 individual cases has shown that the amended plan is an equitable and reasonable coordination with the old-age, survivors, and disability insurance system. Considerably increased benefits are provided for those who in the past had entered the TVA system at older ages and so could not have a full lifetime of service by the time they retire. This provision seems to be reasonable in itself and also parallels generally the effect of the coordination of private pension plans with old-age, survivors, and disability insurance. Such liberal treatment, however, will not be accorded to those entering in the future at the middle and older ages, since they will have had the opportunity to obtain coverage under the general program in their previous employment and possibly, also, partially vested rights to supplementary benefits under a private plan. For those who enter the system at a relatively early age, the benefits under the amended plan closely parallel those under the former plan. Consequently, for these individuals there is no "piling on" of retirement income as a result of the coordination, although under the amended plan they now have, of course, the advantage of old-age, survivors, and disability insurance protection for their survivors.

Although each individual is not guaranteed that his benefits under the amended plan will always be as large as, or larger than, those under the former plan, the amended plan seems equitable and suitable without such a guarantee. Any such guarantee is difficult to make because of the varying effect of such important factors as future salary scales and the election (or nonelection) of death benefits after retirement. Accordingly, it seems necessary only that the benefits under the amended plan should at least reasonably approximate those under the former plan. This condition is satisfied for the widely varying cases in the sample.

Table 5.—*Illustrative total benefits as percentage of average earnings*[1] *for individuals in sample, former plan and amended plan, under assumption of level future earnings*

Individual	With no TVA death benefit		With TVA death benefit	
	Former plan	Amended plan	Former plan	Amended plan
1	96.6	92.2	83.0	83.9
2	40.6	68.8	36.4	64.9
3	96.3	89.1	82.7	80.9
4	89.1	88.4	77.3	80.9
5	75.4	86.9	66.2	79.9
6	73.9	75.8	64.4	69.8
7	66.1	79.0	58.1	72.5
8	30.5	50.3	27.4	47.7
9	85.0	86.0	74.1	77.0
10	80.7	82.2	70.2	75.7
11	26.0	45.8	22.9	43.2
12	98.8	95.2	84.6	86.4
13	61.0	71.5	53.6	65.2
14	85.0	84.5	73.9	76.9
15	68.5	72.5	59.7	66.8
16	78.5	88.4	70.5	82.8
17	55.0	65.9	49.1	60.3
18	63.2	87.5	56.6	81.3
19	52.6	62.2	46.2	56.6
20	52.4	61.7	45.9	56.9

[1] Average earnings in the highest 5 consecutive years of service, as determined for the computation of the TVA pension.