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4th July 1983

REPORT ON THE VALUATION OF
THE TRANSKEIAN GOVERNMENT SERVICE PENSION FUND
AS AT 31ST MARCH 1980

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INTRODUCTION

1. The Fund which was previously known as the Transkeian Government Employees' Pension and Gratuity Fund was established on 1st July 1921 and had therefore been in existence for fifty eight years and nine months at the date of the valuation.
2. The last valuation was made at 31st March 1975 and disclosed that the liabilities for service to that date exceeded the assets by R2 804 682. The value of benefits for service after 31st March 1975 exceeded the value of future contributions at the total rate of 3,05 times the members' contributions by R58 620. The total shortfall was therefore R2 863 302. The total contributions payable by the members and from revenue were equal to 3,47 times the members' contributions. The contributions of 0,42 times the members' contributions not taken into account for the future in the valuation would have redeemed the unfunded liabilities of R2 863 302 plus compound interest at the rate of 6% a year in about 10 years if the Fund made neither a profit nor a loss on its operations during that period.

BENEFITS AND CONDITIONS

3. The principal benefits and conditions of the Fund at the valuation date are set out in the following paragraphs.
4. The retiring benefit at the pensionable age for a member who has not less than 10 years' pensionable service is an annuity equal to $1/55$ th and a gratuity equal to 6,72% of his final average emoluments (annual average of his pensionable emoluments over the last 3 years of his pensionable service) per year of his pensionable service. In addition a supplementary amount as determined by the Minister from time to time (presently amounting to R180 a year) is payable. The annuity is payable for 5 years certain and for the pensioner's lifetime thereafter.
5. The benefit on ill-health retirement for a member who has not less than 10 years' pensionable service is as described in paragraph 4, based on his pensionable service at retirement increased by a period not exceeding five years that depends on his age and pensionable service.
6. On the death of a member in the service, his widow receives a pension equal to one-half of the annuity to which he would have been entitled had he remained in the service to the pensionable age, based on his final average emoluments at the date of death.
7. On the death of a member in the service his dependants receive -
 - (a) if he has completed less than 10 years' pensionable service, a gratuity equal to his final average emoluments, or
 - (b) if he has completed not less than 10 years' pensionable service, a gratuity equal to the sum of the gratuity and five times the annuity that would have been payable had he retired as a result of ill health on the date of his death.

8. On the death of a pensioner, his widow receives a pension equal to one-half of his annuity.

9. On resignation a member receives a benefit in accordance with a formula based on his final average emoluments and pensionable service at the date of resignation.

10. Each male member contributes 7% of his pensionable emoluments and each female member contributes 5%. Contributions equal to 2,47 times the member's contributions are paid from revenue.

11. For the valuation, the pensionable age was taken as 60 years.

TRANSFERS AND MARRIED WOMEN

12. During the five years since the last valuation, a large number of employees who were previously employed by the South African Government were transferred to the Fund. Many of those employees subsequently left the Fund.

13. As a result of the transfer it was not possible to reconcile completely the data, contributions and benefits for members and exits among members, nor was it possible to trace all the movements in respect of pensioners.

14. One of the reasons for it not being possible to reconcile the contributions in respect of members was that contributions in respect of married female employees were included in the accounts although those employees are not permitted to become members of the Fund. It is the intention to establish a separate fund for those employees and contributions by and in respect of them will subsequently be transferred to that fund. For the purpose of the valuation a reserve was made equal to the estimated amount of those contributions plus interest amounting at the valuation date to R11 400 000.

MEMBERSHIP

15. The number of members included in the valuation increased from 8056 at 31st March 1975 to 15 233 at 31st March 1980, as follows:

	<u>Male</u>	<u>Female</u>	<u>Total</u>
Number at 31st March 1975	4 610	3 446	8 056
Add : New members	8 837	5 749	14 586
	<hr/>	<hr/>	<hr/>
Deduct : Exits	13 447	9 195	22 642
	<hr/>	<hr/>	<hr/>
Number at 31st March 1980	<u>9 729</u>	<u>5 504</u>	<u>15 233</u>

16. The number of pensioners (that is, retired members in receipt of annuities) increased from 74 males at 31st March 1975 to 330 males and 82 females at 31st March 1980. The number of widows increased from 7 at 31st March 1975 to 215 at 31st March 1980.

17. The total number of persons for whom liabilities were calculated was as follows:

Members	- male	9 729
	- female	5 504
Pensioners	- male	330
	- female	82
Widows		215
		<hr/>
		<u>15 860</u>

INTEREST

20. The corresponding number at 31st March 1975 was 8137.

The value of the assets during the five years ending 31st March 1980 was 8,7% a year compared with 7,3% a year during the preceding four years.

ASSETS

18. The amount of the Fund at 31st March 1980 was shown by the balance sheet to be R68 416 000, made up as follows:-

Public debt commissioners	R41 967 000
Transkei Revenue Fund loans	17 670 000
Transkeian Government Non-Terminal Internal Registered Stock	5 700 000
Loan	1 000 000
Trustland Limited	932 000
United Methodist Church	300 000
Bank of Johannesburg	244 000
University of Port Elizabeth	126 000
Other	113 000
Cash	364 000
	<hr/>
	R68 416 000
	<hr/> <hr/>

19. For the purposes of the valuation all the assets were taken at book value. A reserve of R11 400 000 in respect of contributions by married women was established (paragraph 14) and the assets for comparison with the liabilities were therefore R57 016 000, as follows:

Amount of Fund	R68 416 000
Less : Reserve for married women	11 400 000
	<hr/>
	R57 016 000
	<hr/> <hr/>

INTEREST

20. The average rate of interest earned on the book value of the assets during the five years ending 31st March 1980 was 8,7% a year compared with 7,3% a year during the preceding four years.

21. ~~With~~ If no explicit allowance is made for inflation, the underlying rate of interest used in calculating the liabilities of a pension fund should not exceed the rate that it can reasonably be expected will be earned over a long period in the future, but for inflation. In the last valuation no explicit allowance was made for increases in pensionable emoluments and annuities on account of inflation and the underlying rate of interest used was 6,0% a year.
22. In a fund in which retiring and death benefits are based on average annual pensionable emoluments over the last few years of service, the rate of interest cannot be treated in isolation. For example, if the rate of interest assumed is 9% a year, an explicit allowance can be made for pensionable emoluments to increase on account of inflation by 3% each year and for a bonus addition of 3% to be made to annuities each year. In effect the valuation makes allowance for inflation at a rate equal to the rate of interest earned on the assets in excess of 6% a year. It was therefore decided to retain the underlying rate of 6% a year used for the previous valuation.
23. It can be expected that the rate of return on the assets will be higher than 6% a year for some years to come; but the excess will almost certainly be required to meet part of the strain on the Fund caused by inflation.

VALUATION BASES

24. The experience of members of the Fund during the period under review was examined and compared with the assumptions previously made about rates of withdrawal, mortality, ill-health retirement and increase in pensionable emoluments. The results of the investigation are considered in the following paragraphs.

Withdrawals

25. The number of withdrawals among members during the five years exceeded the number expected on the rates of withdrawal assumed for the last valuation. It is important not to overestimate the number of withdrawals that will take place in the future, because if the actual number of withdrawals is less than has been allowed for, the number of members becoming entitled to retiring benefits will be greater than has been allowed for, and estimates of the liabilities of the Fund will have been too small.
26. It was decided to retain the rates of withdrawal assumed at the last valuation.
27. The number of withdrawals will probably continue to exceed the number allowed for, and the resulting profit will help to meet the additional liabilities that will be incurred if inflation continues.

Mortality

28. The number of deaths among male members was close to the number allowed for and the number of deaths among female members was less than the number allowed for. The rates of mortality previously assumed were retained.

Ill-health retirement

29. The number of retirements due to ill health was less than the number allowed for. Fluctuations in experience must be expected, and it was decided to retain the rates of ill-health retirement adopted for the last valuation.

33. Pensionable emoluments

30. The retiring and death benefits payable are based on a member's average annual pensionable emoluments over the last three years of his pensionable service. The contributions each year are based on the pensionable emoluments in that year. In order to estimate the future benefits that will be paid by the Fund, and the future contributions that will be received, it is necessary to make assumptions about future increases in pensionable emoluments.

31. In the valuation, allowance is made for service increments and promotion by assuming that the pensionable emoluments of members will increase in the future at certain average rates depending only upon age. This method gives sufficiently accurate results for practical purposes, provided there is no material change in the general level of pensionable emoluments.

* 32. At any time, assets should be held by the Fund which are sufficient to meet the expected future payments of benefits in respect of the service of members up to that time. These expected future payments are estimated from present pensionable emoluments and the assumed rates of future increase. If the future increases are greater than have been allowed for, the future payments of benefits will be greater than have been allowed for, and the assets held by the Fund in respect of those payments may be insufficient. Increases in pensionable emoluments that are greater than have been allowed for therefore impose liabilities on the Fund for which no provision has been made.

33. During the five years the pensionable emoluments of members increased by considerably more than was allowed for on the rates of increase adopted for the last valuation. The average annual pensionable emoluments of all male members increased from R1895 at 31st March 1975 to R2774 at 31st March 1980, that is by 46%, while those for female members increased from R1477 to R2294, that is by 55%.
34. It is not practicable, in deciding on the increases in pensionable emoluments to be assumed for the future, to make allowance for increases on the scale experienced in recent years. It is reasonable to assume rates of increase that make adequate provision for service increments and promotion. Additional liabilities in excess of those allowed for, which arise mainly from inflation, must then be met by profits made on the other operations of the Fund, and, if necessary, by an increase in contributions (paragraph 39).
35. It was considered that the rates of increase in pensionable emoluments assumed for the last valuation made adequate provision for service increments and promotion and they were retained.

Inflation

36. In addition to the allowance for service increments and promotion, an allowance can be made for general increases in pensionable emoluments that are due mainly to inflation, but if that is done the rate of interest used for the valuation should be adjusted (paragraph 22).

37. It would be possible to assume in the valuation that inflation will continue at the current rate. The difficulty is that the yield on existing investments is not sufficient to cover the assumed rate of future inflation and give a reasonable return, so that a valuation on such a basis would set a very high value on the liabilities. The rate of interest that can be earned on new investments tends to increase with inflation, but the yield on existing moneys invested in fixed interest securities is not improved until they are redeemed and the proceeds reinvested.
38. In practice valuations of pension funds make allowance, either implicitly or explicitly, for inflation at less than the current rate. It follows that rates of contribution based on such valuation assumptions may have to be supplemented by additional contributions.
39. No explicit allowance for inflation was made in the valuation assumption. Interest earned by the Fund in excess of 6% a year provides an implicit allowance for inflation (paragraph 22). Additional liabilities that arise from increases in pensionable emoluments that are greater than have been allowed for will have to be met from that excess interest, from the margin in the contribution rate, from profits made on the other operations of the Fund or from surplus. If those are not sufficient it will be necessary to increase the contributions.

Valuation bases

40. The valuation bases adopted are shown in Statements 1 and 2 for male and female members.

VALUATION METHOD

41. Particulars were supplied of the members, pensioners and widows at 31st March 1980. Pensionable emoluments and annuities were those at 1st April 1980. The liabilities were calculated from those particulars and the valuation assumptions.

Members

42. For members, the future payments of benefits were estimated and discounted with interest at 6% a year, to give the present value of future benefits. The calculations were made in two parts, one giving the present value of future benefits for service to 31st March 1980 and the other giving the present value of future benefits for service after that date. The supplementary amount referred to in paragraph 4 is not related to service, and was treated as a benefit for service after 31st March 1980. The future contributions by the members, and from revenue at the rate of 1,83 times the members' contributions, were also estimated and discounted, to give the present value of future contributions. As will be seen from paragraph 46, contributions from revenue at the rate of 1,83 times the members' contributions are, with the members' contributions, approximately sufficient to meet the cost of benefits for service after the valuation date on the valuation assumptions.

Pensioners and widows

43. For pensioners and widows, the liabilities were calculated by estimating the future payments to be made by the Fund and discounting them with interest at 6% a year.

VALUATION RESULT

Service to 31.3.1980

44. The total liabilities for service to 31st March 1980 were calculated to be R51 977 000, as follows:

Members	- male	R35 744 875
	- female	8 813 442
Pensioners	- male	5 562 154
	- female	839 447
Widows		1 017 224
		<hr/>
		R51 977 142
		<hr/>
	(say)	<u><u>R51 977 000</u></u>

45. The assets at 31st March 1980 therefore exceeded the liabilities for service to that date by R5 039 000, as follows:

Assets (paragraph 19)	R57 016 000
Liabilities for service to 31.3.1980	51 977 000
	<hr/>
Excess	<u><u>R 5 039 000</u></u>

Service after 31.3.1980

46. The value of future contributions (by the members and at the rate of 1,83 times the members' contributions from revenue) was less than the value of benefits for service after 31st March 1980 by R63 000, as follows:

Value of future contributions	R66 799 003
Value of future benefits	66 862 440
	<hr/>
Shortfall	R 63 437
	<hr/>
	(say) R <u><u>63 000</u></u>

46. Total service valuation at 31st March 1975 had been made on the basis of contributions from revenue of 1,83 times the

47. On the basis of contributions from revenue of 1,83 times the members' contributions, the valuation therefore disclosed a net surplus of R4 976 000, as follows:

Excess for past service	R5 039 000
Shortfall for future service	63 000
Net surplus	<u>R4 976 000</u>

48. Particulars of the liabilities for male and female members are given in Statements 3 and 4.

49. The future contribution payable from revenue not taken into account in the valuation of 0,64 (2,47 less 1,83) times the members' contributions amounted to about R1 613 000 a year at 1st April 1980.

OPERATIONS OF THE FUND

50. The valuation at 31st December 1980 showed a surplus of about R4 976 000. The valuation at 31st December 1975 showed a shortfall of about R2 863 000. The results of the two valuations are not comparable because the valuation at 31st March 1975 was made on the basis of contributions from revenue of 2,05 times the members' contributions, whereas the valuation at 31st March 1980 was made on the basis of contributions from revenue of 1,83 times the members' contributions.

51. Now If the valuation at 31st March 1975 had been made on the basis of contributions from revenue of 1,83 times the members' contributions, it would have shown a shortfall of about R4 649 000. That amount could have been expected to increase with interest at the valuation rate of 6% a year to about R6 221 000 at 31st March 1980. During the five years contributions were paid from revenue in excess of those at the rate taken into account for the future in the valuation equal to 0,64 times the members' contributions. With interest to 31st March 1980, the total amount of excess contributions was R6 410 000. The surplus at 31st March 1980 was therefore expected to be R189 000 (R6 410 000 less R6 221 000).

52. and The actual surplus at 31st March 1980 was R4 976 000. The Fund therefore made a profit on its operations during the five year period of R4 787 000 (R4 976 000 less R189 000). The principal reasons for the operating profit of R4 787 000 were ascertained and are considered in the following paragraphs. The amounts shown were obtained by approximate methods, and as a result of this and of the problems incurred in reconciling the data (paragraphs 12 to 14) give only an indication of the relative importance of the various items.

Interest

53. The rate of interest earned during the period was greater than the rate of 6% a year assumed, and as a result there was a profit of about R4 265 000.

New members and withdrawals

54. The rate of contribution payable by and in respect of new entrants to the Fund with allowance for contributions from revenue of 1,83 times the members' contributions, was greater than required on the valuation assumptions to provide the future benefits, even though the average age of the new members was higher than to be expected, because of the large number of members transferred to the Fund. The Fund therefore made a profit on their admission equal to the margin in the contributions capitalised over their expected periods of service.
55. The number of withdrawals was greater than allowed for, and the Fund made a profit.
56. The total profit from new members and withdrawals was about R9 600 000.

Pensionable emoluments

57. The pensionable emoluments of members increased by considerably more than was allowed for on the valuation assumptions and the Fund incurred a loss of about R6 300 000.

Pensioners

58. During the five years, there was a large number of retirements and deaths of members, particularly among those transferred into the Fund and the pensionable emoluments of those members were higher at the date of retirement or death than expected. The Fund therefore made a loss of about R3 000 000.

Miscellaneous

59. ~~Inter~~ There were several other items of profit and loss but the amounts were relatively too small to be worth a separate calculation. It was assumed for convenience that together they represented a net profit of R222 000, the balancing figure in the summary of profit and loss.

Summary

60. ~~Net~~ The change in the financial condition of the Fund was therefore explained as follows:

Shortfall at 31st March 1975	R4 649 000
Interest at 6% for five years	1 572 000
	<hr/>
Additional contributions	R6 221 000
	6 410 000
	<hr/>
Expected surplus at 31st March 1980	R 189 000

Profits

Interest	R 4 265 000
New members and withdrawals	9 600 000
Miscellaneous	222 000
	<hr/>
	R14 087 000

Losses

Pensionable emoluments	R 6 300 000
Pensioners	3 000 000
	<hr/>
	R 9 300 000

Operating profit	4 787 000
	<hr/>
Actual surplus at 31st March 1980	R4 976 000
	<hr/> <hr/>

OUTLOOK

Interest

61. The Fund is earning a rate of interest in excess of the rate of 6% a year assumed. The Fund will therefore continue to make profits from excess interest. The excess interest earned on the assets held for pensioners and widows can be used to increase their annuities.

New members and withdrawals

62. If new members, other than those transferred into the Fund, continue to be recruited at similar ages to those during the five year period, there will be a profit on their admission while the present benefits and contributions remain in force. In addition there will be profits because the number of withdrawals exceeds the number allowed for.

Pensionable emoluments

63. The assumptions about increases in pensionable emoluments allow for increases through promotion and service; it is probable that the increases in pensionable emoluments will again be greater than allowed for as a result of continuing inflation, with consequent strain on the Fund.

SUMMARY

64. The assets taken at book value less a reserve of R11 400 000 in respect of employees who are not members of the Fund exceeded the liabilities for service to 31st March 1980 by R5 039 000. The value of future contributions by the members, and from revenue at a rate of 1,83 times the members' contributions, was less than the value of benefits for future service by R63 000. The net surplus was therefore R4 976 000.

CPS

STATEMENT 1

THE TRANSKEIAN GOVERNMENT SERVICE
PENSION FUND

VALUATION AS AT 31ST MARCH 1980

Valuation basis - Male members

Age	Number of contributing members	Number of contributing members who, between the ages stated,			Rate of increase per cent (between the ages stated) of pensionable emoluments
		Withdraw	Die	Retire because of ill-health	
20	10 000	3031	87	-	16,3
25	6 882	1550	77	-	16,0
30	5 255	965	72	-	13,8
35	4 218	589	88	20	12,1
40	3 521	333	108	33	10,8
45	3 047	146	146	43	9,8
50	2 712	-	194	104	8,9
55	2 414	-	236	179	7,1
60	1 999				

The figures given in this table are used to estimate the proportion of the members of the Fund at each age who will still be contributing at later ages and who will leave the service from various causes between later ages.

It is assumed that members who reach age 60 retire at that age.

The assumptions about the mortality of present and future pensioners are based in the actual experience of pensioners in South Africa.

STATEMENT 2

THE TRANSKEIAN GOVERNMENT SERVICE
PENSION FUND

VALUATION AS AT 31ST MARCH 1980

Valuation basis - Female members

Age	Number of contributing members	Number of contributing members who, between the ages stated,			Rate of increase per cent (between the ages stated) of pensionable emoluments
		Withdraw	Die	Retire because of ill health	
20	10 000	4087	41	-	16,3
25	5 872	2397	36	-	16,0
30	3 439	1286	29	13	13,8
35	2 111	637	23	18	12,1
40	1 433	320	22	19	10,8
45	1 072	149	22	20	9,8
50	881	42	29	38	8,9
55	772	-	37	55	7,1
60	680				

The figures given in this table are used to estimate the proportion of the members of the Fund at each age who will still be contributing at later ages and who will leave the service from various causes between later ages.

It is assumed that members who reach age 60 retire at that age.

The assumptions about the mortality of present and future pensioners are based on the actual experience of pensioners in South Africa.

STATEMENT 3THE TRANSKEIAN GOVERNMENT SERVICE PENSION FUNDVALUATION AS AT 31ST MARCH 1980

Male members

Nearest ages as at 31.3.1980	Number of members	Annual pensionable emoluments	Present value of benefits for service to 31.3.1980	Present value of benefits for service after 31.3.1980	Present value of future contributions
19 - 22	472	R 852 871	R 76 242	R 1 143 101	R 1 907 475
23 - 27	2390	4 907 635	912 252	8 373 689	11 938 738
28 - 32	1928	4 801 406	1 903 516	9 498 889	11 727 984
33 - 37	1179	3 582 524	2 749 885	7 976 726	8 495 101
38 - 42	938	2 811 831	3 583 103	6 724 514	6 183 094
43 - 47	822	2 738 365	5 079 462	6 477 032	5 186 117
48 - 52	867	3 118 199	7 304 474	6 519 619	4 466 067
53 - 57	749	2 731 311	7 844 541	4 111 012	2 212 950
58 - 60	278	1 080 304	4 544 706	782 826	202 001
61 - 73	106	362 256	1 746 694	190 500	-
Totals	9729	R26 986 702	R35 744 875	R51 797 908	R52 319 527

STATEMENT 4

THE TRANSKEIAN GOVERNMENT SERVICE PENSION FUND

VALUATION AS AT 31ST MARCH 1980

Female members

Nearest ages as at 31.3.1980	Number of members	Annual pensionable emoluments	Present value of benefits for service to 31.3.1980	Present value of benefits for service after 31.3.1980	Present value of future contributions
19 - 22	318	R 583 954	R 32 021	R 293 098	R 646 189
23 - 27	1564	3 035 183	340 313	2 001 739	3 457 231
28 - 32	995	2 392 972	550 495	2 164 553	2 905 346
33 - 37	652	1 598 647	737 292	2 005 746	2 101 441
38 - 42	556	1 360 410	1 041 771	2 209 867	1 840 282
43 - 47	562	1 474 551	1 695 431	2 782 078	1 879 891
48 - 52	459	1 157 055	1 933 049	2 227 014	1 185 357
53 - 57	285	735 700	1 593 060	1 138 750	438 251
58 - 64	113	285 314	890 010	241 687	25 488
Totals	5504	R12 623 786	R8 813 442	R15 064 532	R14 479 476



