GAD
GOVERNMENT **ACTUARY'S** DEPARTMENT

The Scottish Teachers' Superannuation Scheme

Actuarial Review as at 31 March 2005

Report by the Government Actuary

June 2008

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To: ***The Scottish Ministers***

I am pleased to present my report on the actuarial review of the Scottish Teachers' Superannuation Scheme as at 31 March 2005 carried out in accordance with Regulation H2 of the Teachers' Superannuation (Scotland) Regulations 2005 (S.I. 2005 No. 393), as amended.

TJ Llanwarne FIA

Government Actuary

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Finlaison House 15-17 Furnival Street London EC4A 1AB T: +44 (0)20 7211 2601 W: www.gad.gov.uk

The Scottish Teachers' Superannuation Scheme

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1 Introduction

Background

1.1 In accordance with Regulation H2 of the Teachers' Superannuation (Scotland) Regulations 2005 ('the Regulations'), the Scottish Public Pensions Agency (SPPA) has asked me to carry out an actuarial review of the Scottish Teachers' Superannuation Scheme (''the Scheme'') as at 31 March 2005, and to report on the review to the Scottish Ministers. The report on the previous review related to the five-year period ending on 31 March 2001, and was signed by Chris Daykin (the then Government Actuary) on 23 June 2006.

1.2 Membership of the Scheme is open to teachers in schools and other educational establishments in Scotland which are maintained or grant-aided out of money either provided by Parliament or raised by local authorities, and to teachers in many independent schools and establishments of further education, including the universities established in 1992.

1.3 The Scheme is unfunded. All contributions (payable by members and employers) are paid to the Exchequer, and the Exchequer effectively meets the cost of all benefits. However, the financing of the Scheme is based on the standard methodology for unfunded public service pension schemes known as SCAPE (Superannuation Contributions Adjusted for Past Experience). Under SCAPE, an account is maintained ('the Account'), to which contributions from members and employers are credited and from which expenditure on benefits (including pension increases under the Pensions (Increase) Acts) is debited. The Account is also credited with interest at the long term rate determined by HM Treasury from time to time, after taking advice from the Government Actuary.

1.4 In accordance with the terms of the 'Public Services Forum' ('PSF') agreement and subsequent statutory consultation on both the provisions that will apply to new entrants to the STSS and the modifications that will be made to the existing scheme for current members, new STSS arrangements were introduced with effect from 1 April 2007. The PSF agreement was consequential to the proposal in the Pensions Green Paper (of December 2002) to increase the normal pension age in public service schemes from age 60 to age 65, but modified to protect existing scheme members from the higher pension age provided that the new pension arrangements result in at least the same long-term savings as would have been delivered from the implementation of the higher pension age for all members.

1.5 I have been asked to carry out the review assuming, first, that the pre-April 2007 provisions remained in force and, second, taking into account the new provisions effective from 1 April 2007. With effect from that date, the Regulations modified the current provisions for existing members and introduced new provisions for new entrants. Appendix A summarises the pre-April 2007 provisions for existing members. Appendix B summarises the provisions of the modified scheme for existing members from 1 April 2007, and Appendix C summarises the provisions for new entrants after that date.

1.6 This review determines the total (combined) contribution rate that should be paid with effect from 1 April 2009. I have assumed that the members' contribution rate in the STSS will be the same as that set in the Teachers' Pension Scheme (England and Wales). This is discussed further in Section 10.

1.7 Guidance Note GN9 (v8.1), issued by the Board for Actuarial Standard, sets out the requirements for actuarial reports on the funding of defined benefit pension arrangements, particularly those subject to Part 3 of the Pensions Act 2004. The STSS is an unfunded statutory public service pension scheme with the benefits effectively guaranteed by the Government, and is not subject to Part 3 of the Pensions Act 2004. This report has been prepared following the principles of GN9 (v8.1) except those which are not relevant for an unfunded public service pension scheme, including those relating to statutory funding requirements, solvency and investment risk.

Summary of results – new provisions

1.8 As at 31 March 2005, the total full-time equivalent pensionable salary of active members was £2.4 billion (£1.9 billion as at 31 March 2001) and the total pensions in payment was £413 million (£330 million as at 31 March 2001). The notional balance in the SCAPE Account as at 31 March 2005 was £13.0 billion (£10.8 billion as at 31 March 2001).

1.9 As at 31 March 2005, the total (past and future) service liabilities under the new provisions are just over £19.3 billion. There is a valuation deficiency of £836 million, all of which has arisen since 1 April 2001. About £600 million of the deficiency is attributable to discrete changes in the membership data, the implications of which are discussed in Sections 9 and 10.

1.10 Under the new provisions, the combined standard contribution rate in respect of all members is 20.4% of salary, payable from 1 April 2009. The valuation deficiency of £836 million would be eliminated by a supplementary contribution of 3.15% of salary payable for 15 years from 1 April 2009, leading to a total contribution rate of 23.55% of salary payable from 1 April 2009. Allowing for the members' contribution rate of 6.4%, the employers' contribution rate would be 17.15%.

1.11 If Scottish Ministers were to conclude that the appropriate contribution rate should exclude the deficiency arising from the discrete data changes, then the total contribution rate would be 21.3% of salary, payable from 1 April 2009 (based on the combined standard contribution rate of 20.4% plus a supplementary contribution of 0.9%). Allowing for the members' contribution rate of 6.4%, the employers' contribution rate would be 14.9%.

1.12 I understand that SPPA proposes to recommend to Scottish Ministers that the total contribution rate should be 21.3% with effect from 1 April 2009 (comprising members' contributions of 6.4% and employers' contributions of 14.9%).

2 Developments since the 2001 report

2.1 With effect from 1 April 2001, the financing of the Scheme has been based on the methodology known as SCAPE (‘Superannuation Contributions Adjusted for Past Experience’). Under SCAPE, the Superannuation Account is credited with interest at the same real rate of return as that assumed to value the liabilities and determine the standard contribution rate: at the 2001 valuation this was a real rate of interest of 3½% a year (in excess of prices).

2.2 At the 2001 valuation, the standard contribution rate was assessed to be 19.5%, of which 6% was payable by members. Under the Regulations, the balance in the Account as at 1 April 2001 was determined to be equal to the value of the total service liabilities less the value of future contributions (payable at the standard contribution rate) from members and employers as at that date, and so no adjustment to the standard contribution rate was payable on account of any past surplus or deficiency. Thus, the total contribution rate payable by employers, as recommended in the 2001 valuation report, was 13.5% with effect from April 2006.

2.3 With effect from April 2007, the members’ contribution rate changed from 6% to 6.4%, in line with a UK-wide agreement. At the same time, the recommended employers’ contribution rate of 13.5%, as determined by the 2001 valuation, was implemented. Therefore, a total contribution rate of 19.9% became payable from 1 April 2007.

2.4 SPPA has asked me to assume that these contribution rates will remain in force until 31 March 2009.

2.5 Immediately prior to the contribution rate changes at 1 April 2007, employers were paying a contribution rate of 12.5% and members were paying 6%. These rates came into effect in October 2003, based on an interim review of the Scheme as at 31 March 2001 in advance of the full report.

2.6 Table 1 summarises the contribution rates paid (and payable) from 1 April 2001 to 31 March 2009.

Table 1 – Contributions payable from April 2001 to March 2009

(percent of salary)

Period	Standard contribution rate		Supplementary contribution	Total employer rate
	Member	Employer		
April 2001 to March 2002 (i)	6.0	6.40	0.50	6.90
April 2002 to March 2003 (ii)	6.0	6.40	0.75	7.15
April 2003 to September 2003 (iii)	6.0	6.65	0.75	7.40
October 2003 to March 2007 (iv)	6.0	12.5	-	12.5
April 2007 to March 2009 (v)	6.4	13.5	-	13.5

(i) Determined at the 1991 valuation

(ii) Determined at the 1996 valuation

(iii) 2001 and 2002 Regulations

(iv) Determined at the 2001 interim review

(v) Employer rate determined at the 2001 valuation, member rate set with reference to member rate in TPS (England and Wales)

2.7 From 1 April 2009, the total contribution rate (employers and members combined) will be as determined at the current review.

Consolidated Account, 1 April 2001 to 31 March 2005

2.8 Table D1 of Appendix D summarises the consolidated Account for the period from 1 April 2001 to 31 March 2005, and Table D2 sets out the principal items of income and outgo for each year. The notional investment returns shown in Tables D1 and D2 are based on a rate of 3.5% in excess of price inflation (the current rate of return under the SCAPE methodology). There are, however, no actual investments underlying the balance in the Account; in effect, the balance represents a liability of the Exchequer.

2.9 Table D2 shows that, throughout the period, expenditure on benefits exceeded contribution income. However, taking account of the notional SCAPE return, total income exceeded expenditure over the period, and so the balance increased from £10.8 billion as at 31 March 2001 to £13.0 billion as at 31 March 2005.

2.10 It is important to recognise that an excess of income over expenditure does not necessarily indicate that an actuarial review will result in a valuation surplus. The balance in the Account can be considered as corresponding to the assets of a conventionally funded pension scheme, in which contributions must be accumulated during the working lifetime of members in order to provide benefits after retirement.

2.11 Under the SCAPE methodology, no surplus or deficiency will arise as a result of interest credited to the Account (because interest is credited at the same rate as the assumed valuation rate of interest).

Pay awards

2.12 Table 2 shows the pay awards granted since the 2001 valuation.

Table 2 – Pay awards from 1 April 2001 to 1 April 2005

Award date	Increase
1 April 2001 *	10.0%
1 April 2002	4.2%
1 April 2003	3.5%
1 August 2003	4.0%
1 April 2004	2.9%
1 April 2005	2.9%

* The increase at 1 April 2001 was taken into account at the 2001 valuation.

Pension increases

2.13 Table 3 shows the pension increases awarded since the 2001 valuation.

Table 3 – Pension increases from April 2001 to April 2005

Award date	Increase
April 2001*	3.3%
April 2002	1.7%
April 2003	1.7%
April 2004	2.8%
April 2005	3.1%

* The April 2001 increase was taken into account at the 2001 valuation.

3 Changes to the Scheme from 1 April 2007

Scheme provisions

3.1 The Teachers' Superannuation (Scotland) Regulations have been amended to implement significant changes to the benefit structure of the STSS with effect from 1 April 2007, both for new members and existing members, with consequential implications for actuarial reviews (including the current review, as at 31 March 2005).

3.2 New entrants joining the Scheme from 1 April 2007 and existing members who return to service after 31 March 2008 following a break in pensionable employment of more than five years will be subject to new provisions. The normal pension age (NPA) will be 65 but they will be able to retire before or after this age with benefits (broadly) actuarially equivalent to those that would be paid from age 65. The pension accrual rate will be 1/60th (but with no automatic lump sum). Lump sums will be available by commutation of pension at a rate of £12 of lump sum for every £1 of pension forgone. Other significant changes relate to dependants' benefits, ill health retirement benefits and the definition of final pensionable salary. Appendix C summarises the main provisions of the Scheme for new entrants after 1 April 2007.

3.3 Existing members as at 1 April 2007 remain subject to the provisions in force at the valuation date (including an NPA of 60 and a pension accrual rate of 1/80th (plus a lump sum of 3/80th)) but with some changes consistent with the provisions for new entrants after 1 April 2007. (The future service of existing deferred members who subsequently re-join the Scheme after 31 March 2008 following a break of more than five years will be subject to the same provisions as new entrants after 1 April 2007.) Existing members can also commute pension at a rate of £12 of lump sum for every £1 of pension forgone in order to top up the automatic lump sum. Appendix A summarises the provisions applying to existing members (prior to 1 April 2007), and Appendix B summarises the modified provisions for existing members from 1 April 2007.

3.4 The overall effect of the changes is that all members will be subject to the same benefit provisions for future service except in respect of NPA, the accrual rate of pension (and lump sum) and the minimum amount of lump sum that can be taken.

3.5 The changes for both existing members and new entrants from 1 April 2007 deliver the long term savings from the STSS that were required by the Chief Secretary to the Treasury under the terms of the PSF agreement. In particular, it was necessary to increase the contribution rate payable by all members from 6% to 6.1% with effect from 1 April 2007 to meet the PSF terms and provide for the benefit structure that has been agreed for existing members and new entrants. In addition, under a wider agreement on long term financial sustainability, SPPA has asked me to assume that the member contribution rate in the STSS will be equal to that set in the Teachers' Pension Scheme (England and Wales). As a result, the STSS member contribution rate that came into effect from 1 April 2007 was 6.4%. This review will determine the total contribution rate that should be paid with effect from 1 April 2009.

3.6 For the purpose of this report, the provisions applying prior to 1 April 2007 are referred to as the 'pre-2007 provisions', and the provisions applying from 1 April 2007 onwards (to both existing members and new entrants after that date) are referred to as the 'new provisions'.

New taxation regime

3.7 With effect from 6 April 2006 ('A-day'), Her Majesty's Revenue and Customs (HMRC) introduced a new pensions tax regime. The new regime introduces a wide range of new measures including substantial changes to the maximum pension benefits that members can receive before being subject to additional taxation.

3.8 In particular, the HMRC now permits members to take a higher proportion of retirement benefits in the form of a lump sum (instead of pension). The STSS Regulations allow existing members and new entrants retiring after 1 April 2007 access to the higher retirement lump sums available under the new regime. I have taken account of this change (from 1 April 2007) at the current valuation under the new provisions.

4 Membership data

4.1 The Scottish Public Pensions Agency (SPPA) supplied data in respect of the following groups:

(i) members in service and salaries payable as at 31 March 2005;

(ii) pensions in payment as at 31 March 2005;

(iii) members entering and leaving service during the 4 years ended 31 March 2005;

(iv) new awards and cessations of pension in the 4 years ended 31 March 2005;

(v) former members with preserved (or deferred) benefits as at 31 March 2005.

Data issues

4.2 There were a number of concerns regarding the valuation data, most significantly:

(i) Salary data for active members showed a significant shortfall compared to the contributions recorded in the audited Scheme Accounts.

(ii) Data for deferred members could not be reconciled with that for the previous valuation.

(iii) Movements between active and deferred status could not be reconciled.

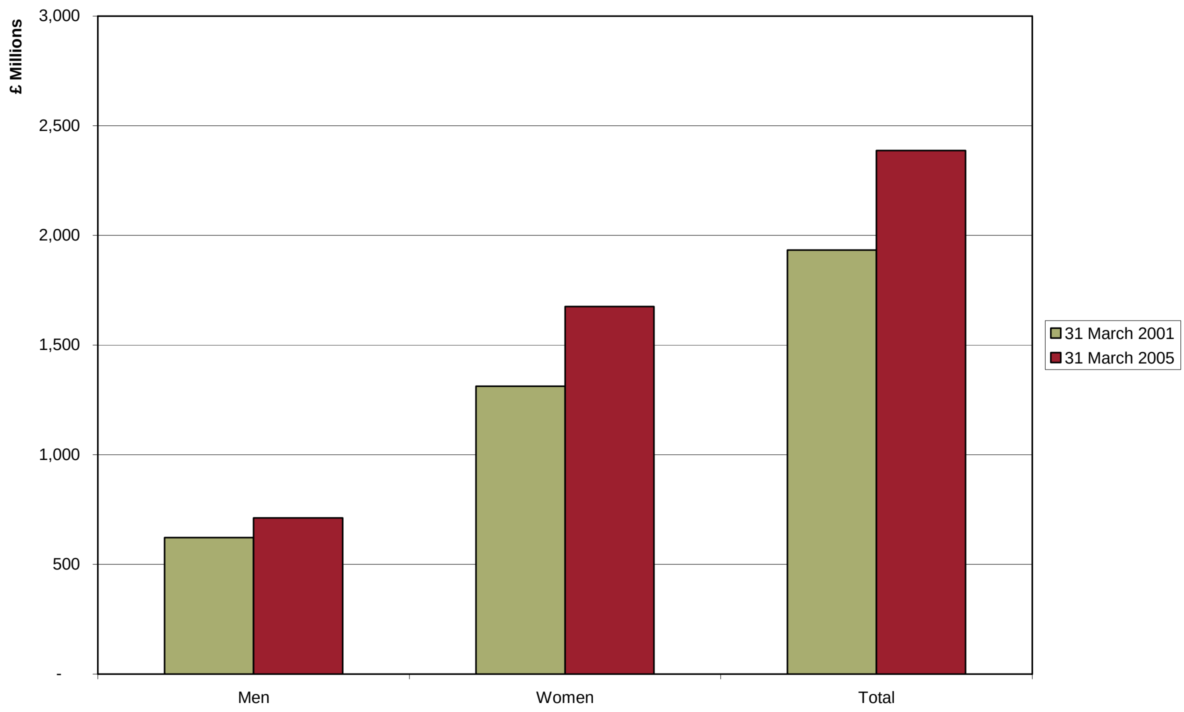
4.3 GAD and SPPA have worked together over a considerable period of time trying to resolve the problems, and the reasons behind many of the problems are understood. In order to carry out the review, GAD and SPPA have discussed and agreed a number of approximate adjustments to the valuation data.

4.4 We consider these adjustments to be reasonable for the purposes of the valuation. However, we cannot be certain that the data is reliable, as it cannot be reconciled with other sources. Consequently the valuation results are subject to a degree of uncertainty as a result of the membership data. Also, it has not been possible to analyse some aspects of the Scheme's demographic experience over the period 2001 to 2005 with a view to setting assumptions for future experience.

Active membership

4.5 Figure 1 illustrates the total salaries of active members as at 31 March 2005 and as at 31 March 2001.

Figure 1 – Total salary of active members*



* Salaries as at 31 March 2001 include the 10% increase awarded on 1 April 2001
Salaries as at 31 March 2005 include the 2.9% increase awarded on 1 April 2005

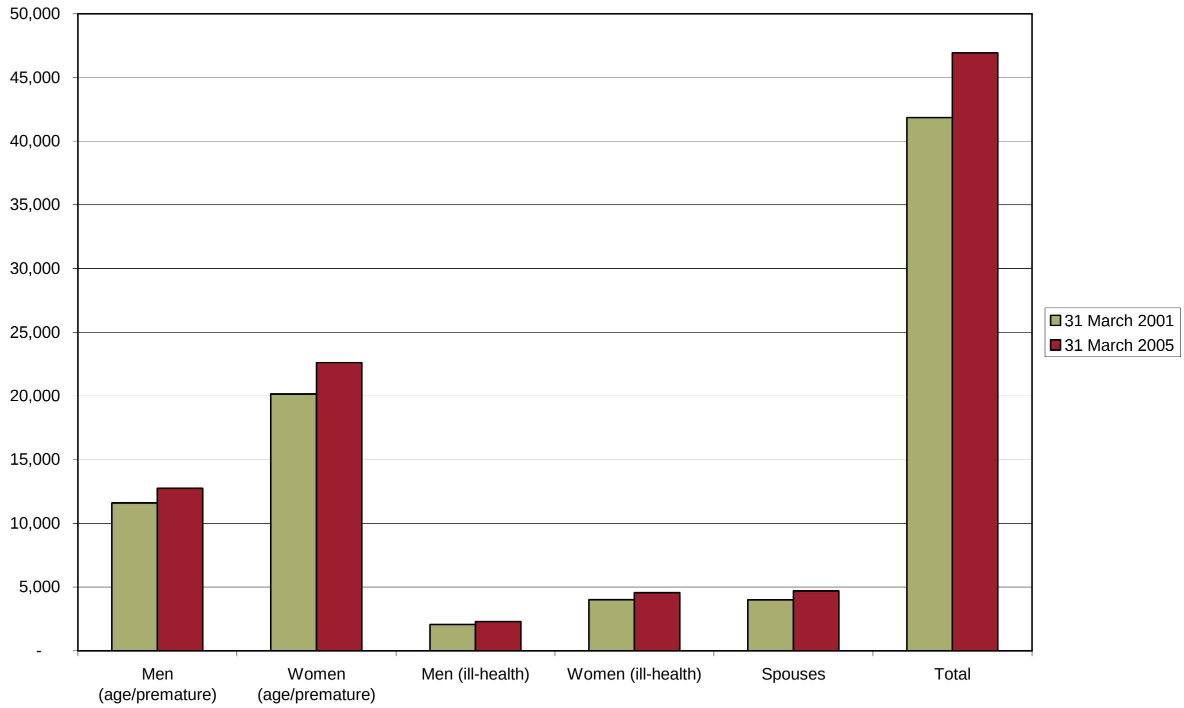
4.6 Total annual pensionable salaries increased by about 24% (from £1.93 billion to £2.39 billion) over the inter-valuation period. This increase in salary corresponds to average annual increases of just under 5.5% a year since 1 April 2001.

4.7 Tables E1 and E2 of Appendix E summarise the data on active members, including total salaries, as at 1 April 2001 and as at 1 April 2005 (after making the adjustments agreed with SPPA) respectively. The total salary data as at 31 March 2005 has been adjusted to be consistent with the audited accounts but it is uncertain whether the adjustments should also relate to the number of members, and so Table E2 does not show the number of active members.

Pensioners and dependants

4.8 Figure 2 illustrates the number of pensioners (excluding children) as at 31 March 2005 and as at 31 March 2001.

Figure 2 – Total number to pensioners



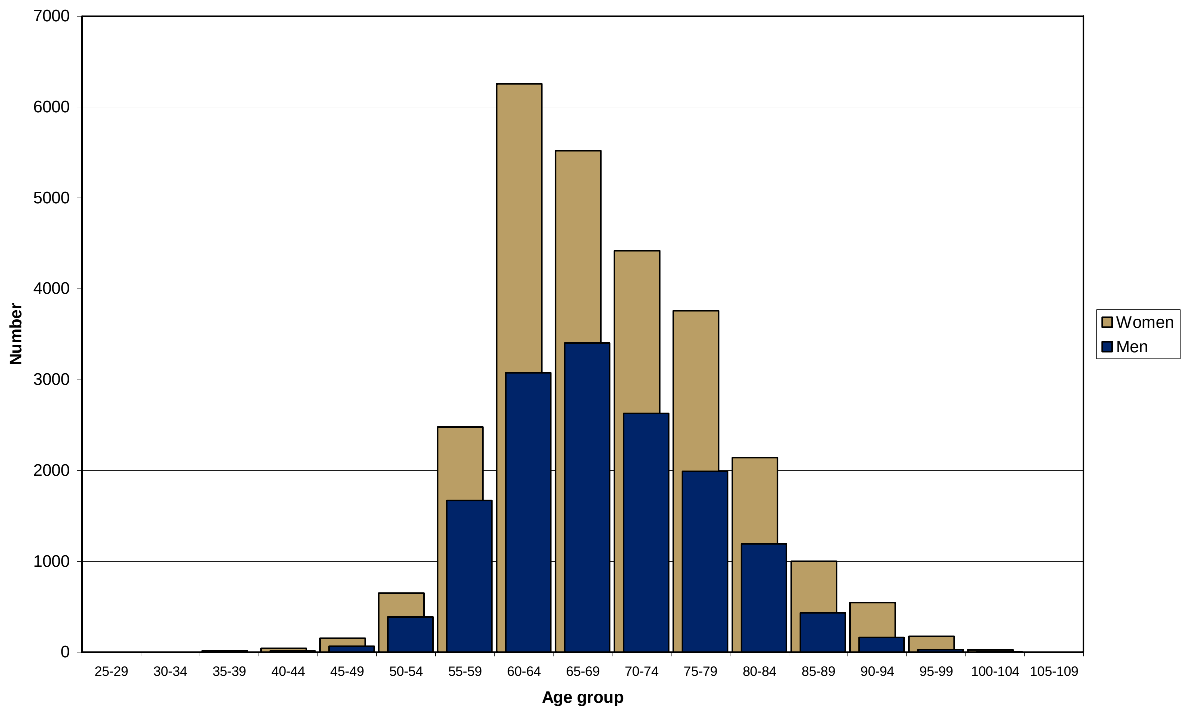
4.9 Over the inter-valuation period, the number of pensioners increased by about 12%.

4.10 Total annual pensions in payment increased by about 25% over the inter-valuation period, while the average member pensions in payment (including pension increases) increased by 12% to about £8,800 a year at 31 March 2005 (taking into account the increase payable in April 2005).

4.11 Table E3 of Appendix E summarises the number and amounts of pensions in payment (including pension increases) as at 31 March 2005, and the corresponding numbers and amounts as at 31 March 2001.

4.12 Figure 3 illustrates the age distribution of male and female pensioners.

Figure 3 – Age distribution of pensioners



Deferred membership

4.13 Members who leave service before retirement age with less than two years' pensionable service may choose to take a return of member's contributions with interest. Members who leave service before retirement age with more than two years' service are granted deferred benefits, payable at age 60. A significant proportion of deferred members (with either less or more than two years' previous service) return for a further period of service before age 60.

4.14 As at 31 March 2005, there were about 3,600 men and 11,200 women with entitlement to deferred benefits. There were a further 6,200 deferred members with less than two years' service who do not have a pension entitlement unless they return to active service and complete at least two years' service in aggregate.

4.15 The average pension in payment for deferred members (with pension entitlement) has increased from £2,300 as at 31 March 2001 to £3,700 as at 31 March 2005 (taking into account the increases awarded in April 2001 and April 2005 respectively), an increase of about 60%. This significant increase cannot be fully explained by expected increases to deferred pension amounts over time, and the implications of this are discussed in Section 9.

4.16 Table E4 of Appendix E summarises the number and amounts of deferred pensions (including pension increases) as at 31 March 2005 (after the adjustments agreed with SPPA), and the corresponding numbers and amounts as at 31 March 2001.

5 Valuation methodology – Pre-2007 provisions

5.1 I have first carried out the valuation as if the provisions in force at the valuation date (the pre-2007 provisions) had remained in force after 1 April 2007 and without any allowance for the higher retirement lump sums available under the new taxation regime.

5.2 This element of the review has been carried out using a 'prospective benefits' valuation methodology known as the 'Entry Age Method'. This is the same methodology as used at previous actuarial valuations of the Scheme.

The Entry Age Method

5.3 Under this approach, the objective is to meet the cost of members' benefits by means of a stable contribution rate (the 'standard contribution rate'), expressed as a percentage of salary, payable during active service. The standard contribution rate (known as the new entrant contribution rate) is calculated to be the rate required to meet the cost of the benefits expected to accrue throughout the career of a typical new entrant joining the Scheme at the assumed normal entry age.

5.4 The actuarial valuation is carried out by reference to the total prospective service of the membership at the review date. That is, the liability in respect of active members is based on both past and future service, allowing for future increases in earnings. The liability in respect of deferred members is based on past service and future service after re-entry to the Scheme, again allowing for future increases in earnings. The liability in respect of pensioners and dependants is based on the pensions in payment (and contingent pensions) at the review date. For consistency, the notional assets consist of the balance in the Account plus the future contributions (at the standard contribution rate) arising from the future service of the membership as at the valuation date (including contributions payable in respect of deferred members after re-entry to the Scheme).

5.5 If the notional assets (including future contributions) exceed (or fall short of) the liabilities in respect of total service, then the actuarial surplus (or deficiency) would be addressed by an adjustment to the standard contribution rate. The Regulations state that a surplus should be eliminated by means of a contribution reduction (or that a deficiency should be eliminated by means of a supplementary contribution) spread over a period of fifteen years.

5.6 Provided that the future experience is in accordance with the actuarial assumptions adopted to calculate the standard contribution rate, then the contributions should be just sufficient to meet the cost of benefits arising from the service of a typical new entrant. The standard contribution rate should remain broadly stable over time provided that the actuarial assumptions (including the assumed distribution by age and sex of members entering service) remain broadly unchanged.

6 Valuation methodology – New provisions

6.1 I have also carried out the valuation allowing for the provisions that came into force with effect from 1 April 2007 (the new provisions), and including allowance for the higher retirement lump sums available under the new taxation regime.

6.2 The valuation has been carried out separately for existing members and new entrants in order to derive a combined contribution rate appropriate for payment over the period 1 April 2009 to 31 March 2012 (the assumed implementation date of the contributions recommended at the 2009 review).

6.3 The new entrant valuation has been carried out using the Entry Age Method, as described in Section 5. This is the same methodology as used at previous actuarial valuations of the Scheme, and for the review on the pre-2007 provisions (Section 5).

6.4 The existing members' valuation has been carried out using a methodology known as the 'Attained Age Method'. This methodology is appropriate for valuing a scheme closed to new entrants. Paragraphs 6.5 to 6.10 describe the Attained Age Method in greater detail.

The Attained Age Method

6.5 Under this approach, the objective is to meet the cost of members' future service benefits by means of a stable contribution rate, expressed as a percentage of salary, payable over the future service of existing members.

6.6 The standard contribution rate (known as the attained age contribution rate) is calculated to be the rate required to meet the cost of the benefits expected to accrue to the existing membership throughout the remainder of their careers. Provided that the future experience is in accordance with the actuarial assumptions adopted to calculate the standard contribution rate, then the contributions should be just sufficient to meet the cost of benefits arising from the future service of the existing membership.

6.7 The actuarial valuation is carried out by reference to the total prospective service of the membership at the review date. The liability in respect of active members is based on both past and future service, allowing for future increases in earnings. The liability in respect of deferred members is based on past service and future service after re-entry to the Scheme, again allowing for future increases in earnings. The liability in respect of pensioners and dependants is based on the pensions in payment (and contingent pensions) at the review date. For consistency, the notional assets consist of the balance in the Account plus the future contributions (at the standard contribution rate) arising from the future service of the membership as at the valuation date (including contributions payable in respect of deferred members after re-entry to the Scheme).

6.8 The existing active membership will, on average, be older than a typical new entrant, and so the attained age contribution rate is generally higher than the new entrant contribution rate. Consequently, moving from the Entry Age Method to the Attained Age Method increases the value of future contributions. This generates additional surplus (relative to the Entry Age Method) which is applied to reduce the higher standard contribution rate under the Attained Age Method. For the purpose of this report, the resulting contribution rate is referred to as the 'adjusted contribution rate'.

6.9 The existing membership will age over time, and so, all other things being equal, the standard contribution rate (expressed as a percentage of salary) is expected to increase gradually at future valuations. However, since the standard contribution rate at any valuation should be sufficient to meet the expected cost of all future benefits, a higher standard contribution rate at a subsequent valuation should lead to valuation surplus. This surplus would normally be applied to reduce the higher standard contribution rate, so that the adjusted contribution rate is stable from one valuation to the next. For this reason, the Attained Age Method is particularly suitable for the valuation of a closed group (ie one to which there are no new entrants) that will age over time.

6.10 Any surplus (or deficiency) not arising from the use of the Attained Age Method (as described in paragraphs 6.8 and 6.9) would be addressed by a further adjustment to the contribution rate. The Regulations require that a surplus should be eliminated by means of a contribution reduction (or that a deficiency should be eliminated by means of a supplementary contribution) spread over a period of fifteen years.

Combined contribution rate

6.11 The combined contribution rate payable from 1 April 2009 to 31 March 2012 is based on the separate contribution rates in respect of existing members and new entrants.

6.12 The combined standard contribution rate is determined as the weighted average of the adjusted contribution rate in respect of existing members (described in paragraph 6.8) and the standard contribution rate in respect of new entrants. These two contribution rates are weighted by the estimated proportion of the total salary roll payable to the two groups of members over the period 1 April 2009 to 31 March 2012, allowing for the gradual growth of new entrants.

6.13 At future valuations, all other things being equal, the combined standard contribution rate should fall gradually towards the standard contribution rate in respect of new entrants (after 1 April 2007), as the proportion of the total salary roll relating to new entrants increases.

6.14 The combined standard contribution rate is then adjusted by the contribution reduction (or supplementary contribution) required to eliminate any surplus (or deficiency) in respect of existing members, other than that arising from the change to the Attained Age Method, payable for fifteen years (paragraph 6.10).

7 Financial assumptions

The Account

7.1 The valuation is based on the Account maintained from 1 April 2001 to 31 March 2005. Table D1 of Appendix D summarises the consolidated SCAPE account for the four-year period. As at 31 March 2005, the balance in the Account (ie the value of the notional investments) was about £13.0 billion, an increase of about £2.2 billion since 31 March 2001.

Specified rate of return (in excess of price increases)

7.2 The actuarial review as at 31 March 2005 has been carried out under the SCAPE methodology. Under SCAPE, interest is credited to the Account at the long term rate determined by HM Treasury from time to time, after taking advice from the Government Actuary. The same rate of return is used to value the liabilities of the Scheme and determine the standard contribution rate. For the current review as at 31 March 2005, the assumed rate of return is 3½% a year in excess of price increases, the same real rate as was adopted for the 2001 valuation.

Other financial assumptions

7.3 Although the liabilities after retirement are linked to price increases, the liabilities accruing during active service are related to general increases in earnings. Accordingly, it is also necessary to consider the rate of return in relation to earnings increases. Historically, there has been a reasonably close correlation between price increases and general earnings increases, and so real earnings growth (in excess of price increases) has remained relatively stable by comparison to the individual rates of increase of prices and earnings. It has been assumed that the rate of investment return in excess of general earnings increases will be 2% a year, which is equivalent to assuming that real earnings growth will be about 1½% a year. (Section 8 considers career increases in salaries on account of promotion and other factors.)

7.4 Pensions accrued during the period from 1978 to 1997 include an element of pension (known as the Guaranteed Minimum Pension or GMP) on which the State pays some (or all) pension increases. An assumed gross rate of return is required in order to value GMPs. For the purposes of the actuarial review as at 31 March 2005, it has been assumed that the long-term gross rate of return will be 6½% a year. (This assumption has a relatively minor bearing on the outcome of the valuation).

Summary of financial assumptions

7.5 Table 4 summarises the financial assumptions adopted for the current valuation and, for comparison, those adopted for the 2001 valuation.

Table 4 – Summary of financial assumptions

Assumption	2005 valuation	2001 valuation
Gross rate of return	6½%	7%
Real rate of return in excess of:		
Prices	3½%	3½%
Earnings	2%	2%
Rate of real earnings growth *	1½%	1½%

* In addition to increases arising from salary progression, promotion etc

7.6 The assumed real rates of return (of 3½% in excess of prices and 2% in excess of earnings) are the same as those adopted at the 2001 review. However, the assumed gross rate of return of 6½% a year is lower than that assumed in 2001 (of 7% a year), reflecting the continuing fall in interest rates. Whilst these assumed rates of return may appear high in comparison with current market rates of interest, the liabilities of the Scheme will not emerge for many years. The financial assumptions adopted for the review are based on long-term considerations.

8 Demographic assumptions

8.1 This section summarises the demographic assumptions adopted for the current review. Paragraphs 8.2 to 8.11 discuss the assumptions relating to mortality after retirement. Paragraphs 8.12 to 8.21 summarise the additional demographic assumptions adopted in order to value the liabilities and determine the standard contribution rate.

Pensioner mortality after age and premature retirement

8.2 The recent mortality experience of age and premature retirement pensioners is similar to that in the standard mortality tables published by the actuarial profession known as PMA92, with one year age reduction, (men) and PFA92, with no age adjustment, (women). (For males, this represents lighter mortality than was assumed at the 2001 valuation.)

8.3 Since the 2001 valuation, the actuarial profession and other bodies have continued to discuss and project future levels of mortality improvement. The broad consensus is that younger people will be subject to greater levels of future improvement than has previously been assumed, and than is incorporated in the standard PMA92 and PFA92 tables. I have therefore included allowance for future mortality improvement broadly consistent with that included in the UK 2004-based population projections which, for future pensioners (ie existing (active and deferred) members and new entrants) produces greater allowance for future mortality improvement than the standard tables.

8.4 For existing pensioners, the assumed mortality rates are in accordance with the standard PMA92 and PFA92 tables but with a reduction of one year of age for male pensioners. (This implies greater longevity than the unadjusted standard tables.) Table 5 shows the life expectancy of existing pensioners on this basis and on the basis adopted for the 2001 valuation.

Table 5 – Life expectancy of existing pensioners

Age at valuation date	Current (2005) valuation		Previous (2001) valuation	
	Men (years)	Women (years)	Men (years)	Women (years)
60	25½	27½	24	27
65	20½	22½	19	22
70	16	18	15	18
75	12	14	11	14
80	9	10½	8	10½

8.5 In respect of existing active and deferred members, the mortality rates in the standard tables have been projected to the calendar year 2045 with a reduction of one and a half years of age for male members and a reduction of half a year of age for females. For new entrants, the mortality rates in the standard tables have been projected to the calendar year 2045 with a reduction of two years of age for males and a reduction of one year of age for females.

8.6 The assumed life expectancy at age 60 of existing active and deferred members is 27½ years for men and 29½ years for women. The assumed life expectancy at age 60 of future new entrants is 28 years for men and 30 years for women.

Pensioner mortality after ill-health retirement

8.7 The mortality of ill-health pensioners is expected to be heavier than that of age retirement pensioners. Under the new provisions, there are two tiers of ill-health retirement. We expect the mortality of the two groups of future ill-health pensioners to differ but I have assumed that the overall mortality of future ill-health pensioners under the new provisions will be the same as if the pre-2007 ill-health provisions had remained in force.

8.8 The assumed mortality of existing ill-health pensioners is based on the standard PMA92 and PFA92 tables with adjustments to reflect the recent experience. The assumed life expectancy at age 60 of existing ill-health pensioners is 19½ years for men and 23½ years for women.

8.9 The assumed mortality of future ill-health pensioners is similar although allowance is also included for additional future mortality improvement and for heavier mortality in the years immediately following retirement. The assumed life expectancy of current actives retiring on ill-health at age 55 is 24½ years for men and 28 years for women.

8.10 For new entrants, the assumed mortality is as for current actives but with an additional reduction of one half of a year of age. The assumed life expectancy of new entrants retiring on ill-health at age 55 is 25 years for men and 28½ years for women.

Spouses' and partners' mortality

8.11 For existing widows, I have adopted the standard WA92 mortality table with a reduction of one year of age. For existing widowers, I have adopted the standard PMA92 table with a reduction of one year of age. In respect of the mortality of future spouses, similar future mortality improvements have been assumed to those for future member pensioners. Mortality of Surviving Nominated Partners ('partners') has been assumed to be the same as that for spouses. The assumed proportions of members eligible for spouse's benefits are the same as those adopted for the 2001 valuation with additional allowance for members eligible for partners' benefits.

Active members

8.12 Under the pre-2007 provisions and the new provisions for existing members, the assumed rates of age retirement from 60 to 65 are unchanged from the 2001 valuation. Allowance has also been included for future premature retirements and early retirements with actuarially reduced benefits from age 55 to age 59 (although both are broadly cost neutral to the Scheme). By allowing for early retirements in this way, the average age of retirement in normal health is assumed to be slightly lower than assumed at the 2001 valuation.

8.13 Under the new provisions for new entrants, allowance has been included for future premature retirements and early retirements with actuarially reduced benefits from age 60 to age 64 (although both are broadly cost neutral to the Scheme). Members still in active service are assumed to retire on attaining age 65. (No allowance is included for members retiring after age 65 since such members will receive actuarially enhanced benefits that are broadly cost neutral to the Scheme.)

8.14 The assumed rates of ill-health retirement are the same as adopted for the 2001 valuation, for both men and women. SPPA has asked me to assume that two thirds of members taking ill-health retirement after 1 April 2007 will be eligible for the higher tier of benefits.

8.15 For both men and women, the assumed rates of death in service are slightly lower than those adopted for the 2001 valuation.

8.16 The assumed withdrawal rates for both men and women are the same as adopted for the 2001 valuation. For both men and women, I have assumed that higher withdrawal rates will apply in the first two years of service than apply to members of the same age with more than two years' service.

8.17 On re-entry to the Scheme after withdrawal, a member may aggregate the earlier period of service with the service subsequent to re-entry. The valuation allows for re-entry in the period between withdrawal and normal pension age of members who withdraw from service more than 10 years before normal pension age. The benefits in respect of both periods of service are based on the salary at the final date of exit. I have assumed that other deferred members receive benefits at normal pension age.

8.18 In addition to the allowance for general increases in salary (see paragraph 7.3), the valuation also includes allowance for increases in salary arising from increments and promotion. For both men and women, the assumed promotional scale is the same as that adopted for the 2001 valuation.

8.19 For the purpose of calculating the new entrant standard contribution rate, I have assumed that new entrants join the Scheme at a range of ages with an average of about age 34 for men and age 33 for women. It is assumed that about 70% of new entrants are female. These are the same assumptions as adopted at the previous valuation.

8.20 Under the new provisions and the new taxation regime, new entrants after 1 April 2007 (with a $1/60^{th}$ pension) will be allowed to commute up to 35% of the $1/60^{th}$ pension for additional lump sum, at a rate of 12:1. I have assumed that new entrants will, on average, commute about 25% of the $1/60^{th}$ pension: this is equivalent to assuming commutation of a lump sum equal to $3/80^{th}$ plus one third of the additional allowable maximum above that $3/80^{th}$ lump sum.

8.21 Under the new provisions and the new taxation regime, existing members (with a $1/80^{th}$ pension and an $3/80^{th}$ lump sum) will be allowed to commute up to 20% of the $1/80^{th}$ pension for additional lump sum, at a rate of 12:1, with effect from 1 April 2007. I have assumed that existing members will, on average, commute about 6½% of the $1/80^{th}$ pension: that is, about one third of the allowable maximum. This is consistent with the assumption adopted for new entrants.

8.22 Appendix F discusses the demographic experience over the four years ending 31 March 2005. Appendix G tabulates the assumptions at specimen ages.

9 Valuation result – Pre-April 2007 provisions

9.1 This section sets out the results of the valuation assuming that the pre-2007 provisions had remained in force (and that there is no additional commutation under the new taxation regime), carried out under the Entry Age Method (as described in Section 5).

Standard contribution rate

9.2 The standard contribution rate as at 1 April 2005 is assessed to be 20.75% of salary, of which the employer's share is 14.75% (assuming members' contributions had continued at 6%).

9.3 The standard contribution rate of 20.75% of salary is 1.25% higher than the corresponding rate of 19.5% at the 2001 valuation. The main factors underlying the increase are the lighter assumed mortality of males and the allowance for greater future mortality improvement for both males and females.

Valuation result

9.4 The standard contribution rate has been determined so as to meet the cost of benefits arising in respect of new entrants joining the Scheme (under the pre-2007 provisions) after 1 April 2005. However, it has been assumed that the new standard contribution rate would not be payable until 1 April 2009.

9.5 Thus, the contribution rates payable after 1 April 2005, and taken into account for the valuation, are 18.5% of salaries until 31 March 2007 and 19.9% of salaries until 31 March 2009 (see Table 1 in paragraph 2.6), and 20.75% of salaries thereafter. The rate of any contribution adjustment (reduction or supplementary) that would have been payable from 1 April 2009 under the pre-2007 provisions is to be determined by the results of this valuation.

9.6 Table 6 summarises the result of the valuation as at 31 March 2005 under the pre-2007 provisions.

Table 6 – Valuation statement as at 31 March 2005 (pre-2007 provisions)

Present value of:	**£ million**
Liabilities	
Benefits in respect of:	
Pensions in payment	5,337
Deferred members (including after re-entry to service)	1,132
Benefits to active members:	
In respect of service before 31 March 2005	7,632
In respect of service after 1 April 2005	5,420
Total liabilities	19,521
Assets	
Standard contributions:	
Existing members (@6%)	1,625
Employers	
in respect of existing active members	3,652
in respect of existing deferred members (after re-entry to service)	199
Added years contributions	15
Balance in SCAPE Account	13,030
Total assets	18,521
Balance of assets less liabilities	(1,000)

9.7 Table 6 shows that, under the pre-2007 provisions, there is a deficiency of £1,000 million as at 31 March 2005.

Supplementary contribution rate

9.8 The Regulations require that a deficiency should be met by a supplementary contribution payable for 15 years. The deficiency of £1,000 million would be eliminated by a supplementary contribution of 3.80% payable for the 15 years commencing 1 April 2009.

Total contribution rate

9.9 Taking into account the supplementary contribution rate, the total contribution rate under the pre-2007 provisions is 24.55%, payable from 1 April 2009. This contribution rate excludes any additional voluntary contributions payable by members. It also excludes expenses of running and administering the Scheme, which are paid separately by the SPPA.

Trace of deficiency as at 31 March 2005

9.10 At the 2001 valuation, the Regulations required that the balance in the Account as at 1 April 2001 be set equal to the value of the total service liabilities less the value of future contributions (payable at the standard contribution rate) from members and employers as at that date, and so there was no surplus or deficiency. In addition, under the SCAPE methodology, no surplus or deficiency will have arisen as a result of interest credited to the Account (because interest is credited at the same rate as the assumed valuation rate of interest), or the effect of price increases (since the rate of interest is expressed in real terms).

9.11 As discussed in Section 4, there have been significant changes to the data for active and deferred members compared to that used for the previous valuation. The deficiency of £1,000 million at the current valuation is the result of these changes, and changes to the actuarial assumptions at the current valuation.

9.12 Table 7 summarises the main factors underlying the deficiency as at 31 March 2005.

Table 7 – Trace of deficiency as at 31 March 2005

Factor		£ million
Surplus (deficiency) as at 1 April 2001		-
(i)	Changes in actives data	- 450
(ii)	Changes in deferred data	- 150
(iii)	Reduction of ½% in gross rate, to 6½%	- 100
(iv)	Changes to mortality basis	- 250
(v)	Other changes to demographic basis	- 50
Surplus (deficiency) as at 31 March 2005		-1,000

9.13 Items (i) and (ii) in the trace indicate the deficit which has arisen due to unexpected changes in the data used for the 2005 valuation compared to that used for the 2001 valuation. The total deficit arising from these data changes is around £600 million.

9.14 Changes in the valuation data, leading to either surplus or deficit, would normally be the result of the scheme experience over the inter-valuation period (eg salary experience or membership movements) differing from that assumed at the previous valuation. However, we were unable to analyse the experience for actives and deferred (see paragraph 4.4), and so it has not been possible to identify the deficit arising from demographic experience of actives and deferreds.

9.15 It is possible to analyse some elements of the demographic experience using data from external sources (such as data on pay awards). At the 2001 valuation, it was assumed that salaries would increase in line with price inflation plus 1.5% a year. Actual pay awards between 2001 and 2005 were broadly in line with this assumption. This suggests that only a small element of the £450 million deficit resulting from changes in the active data is due to annual pay awards differing from expected.

9.16 More generally, although membership movements over the period are unlikely to have been exactly as expected at the time of setting the 2001 valuation assumptions, we have no evidence to suggest that there were any significant unexpected membership movements. Any effect is likely to be relatively small and could be either positive or negative, but our working assumption is that the demographic experience of actives and deferreds has been broadly in line with the 2001 valuation assumptions. As a result, we have assumed that the demographic experience of actives and deferreds has made no contribution to the deficit.

9.17 We therefore conclude that the deficit shown in lines (i) and (ii) of Table 7 is likely to be the result of discrete changes in the data.

9.18 Further to our discussions, SPPA and GAD believe that there are good reasons to suppose that these changes do not fully reflect the Scheme's experience. In particular, SPPA have referred to:

(i) their efforts to repair long standing data issues;

(ii) the failure of some major employers to submit timeous and accurate data for several years;

(iii) the effect of one-off pay exercises, including pay arrears; and

(iv) the limitations of their existing pension administration system which is currently undergoing replacement.

Effect of change in data from the 2001 valuation to the 2005 valuation

9.19 If the two elements of the total deficit relating to the data changes (ie lines (i) and (ii) of Table 7) were to be set aside for the purpose of determining the total contribution rate, then the supplementary contribution rate payable would be 1.55% (instead of 3.80%), and the total contribution rate payable would be 22.30% (instead of 24.55%). That is, the discrete changes to the data account for a supplementary contribution of 2.25%.

9.20 Equivalently, if the balance in the SCAPE account at the 2001 valuation had been determined using data as at 2001 that was consistent with that used for the 2005 valuation, then the balance in the account as at 31 March 2005 would have been higher by about £600 million and the supplementary contribution rate payable would be 1.55% (not 3.80%).

9.21 SPPA and GAD agree that, at the next valuation of the Scheme (due as at 31 March 2009), it will be necessary to review the membership data taking particular note of the discrete changes identified at this valuation. If it is concluded that the data used for the current valuation is broadly correct, then it would be appropriate to consider adjusting the balance in the SCAPE Account to reflect this.

Sensitivity of results

9.22 Under SCAPE, the Superannuation Account is credited with interest at the same real rate of return as that assumed to value the liabilities and determine the standard contribution rate and so it is not necessary to consider the effect of the valuation rate of interest not being borne out in future. However, the valuation result is sensitive to the demographic assumptions, particularly those relating to mortality.

9.23 Paragraphs 8.4 and 8.5 describe the mortality assumptions adopted for the valuation. If active members retiring on age grounds were assumed to live one year longer (less), then this would increase (reduce) the standard contribution rate by about ¼% of salaries, and also increase (reduce) the supplementary contribution rate by about ½% of salaries.

10 Valuation result – New provisions

10.1 This section sets out the results of the valuation under the new provisions (and allowing for additional commutation under the new taxation regime), that came into effect on 1 April 2007, including the increase in the members' contribution rate from 6% to 6.4%.

10.2 The valuation has been carried out as described in Section 6 – the Attained Age Method for existing members and the Entry Age Method for new entrants after 1 April 2007 – with the separate results used to produce a combined contribution rate payable in respect of all members from 1 April 2009 until 31 March 2012.

Standard contribution rate – existing members

10.3 The standard contribution rate for existing members under the new provisions (allowing for additional commutation) is assessed to be 20.80% from 1 April 2007.

10.4 This rate is similar to that under the pre-2007 provisions of 20.75% (paragraph 9.2), mainly because the change in the valuation methodology (from Entry Age (or EAM) to Attained Age (or AAM)) is broadly offset by the change in the provisions for existing members.

10.5 The change from EAM to AAM produces valuation surplus in respect of the existing members because, with the higher future standard contributions under the AAM, a smaller fund is required in respect of past service liabilities than under the EAM. Allowing for this surplus, the adjusted contribution rate (see paragraph 6.8) payable in respect of existing members under the new provisions falls from 20.80% to 20.50%.

Standard contribution rate – new entrants

10.6 The standard contribution rate for new entrants under the new provisions (allowing for additional commutation) is assessed to be 19.85% from 1 April 2007.

10.7 This is lower than the corresponding rate of 20.75% under the pre-2007 provisions (paragraph 9.2). The increase in the Normal Pension Age from age 60 to 65 reduces the standard contribution rate by 1.65%. The net effect of other benefit changes and commutation increases the contribution rate by 0.75%.

Valuation statement

10.8 The valuation includes the liabilities in respect of the future service of existing active members (and of existing deferred members after re-entry to the Scheme). The assets include the corresponding future contributions payable in respect of existing members (including those payable after re-entry to the Scheme).

10.9 Thus, the contribution rates payable after 1 April 2005, and taken into account for the valuation, are 18.5% of salaries until 31 March 2007 and 19.9% of salaries until 31 March 2009 (see Table 1 in paragraph 2.6), and 20.5% of salaries thereafter. The rate of any contribution adjustment (reduction or supplementary) payable from 1 April 2009 is to be determined by the results of this valuation.

10.10 Table 8 summarises the result of the valuation as at 31 March 2005 under the new provisions.

Table 8 – Valuation statement as at 31 March 2005 (new provisions)

Present value of:	**£ million**
Liabilities	
Benefits in respect of:	
Pensions in payment	5,337
Deferred members (including after re-entry to service)	1,115
Benefits to active members:	
In respect of service before 31 March 2005	7,502
In respect of service after 1 April 2005	5,356
Total liabilities	19,310
Assets	
Standard contributions:	
Existing members (@6% until 31 March 2007, 6.4% thereafter)	1,715
Employers	
in respect of existing active members	3,524
in respect of existing deferred members (after re-entry to service)	190
Added years contributions	15
Balance in SCAPE Account	13,030
Total assets	18,474
Balance of assets less liabilities	(836)

10.11 Table 8 shows that, under the new provisions, there is a deficiency of £836 million as at 31 March 2005. This is some £164 million less than the deficiency under the pre-2007 provisions (paragraph 9.7), mainly due to the allowance for additional commutation by existing members retiring after 1 April 2007.

Supplementary contribution rate

10.12 The Regulations require that a deficiency should be met by a supplementary contribution payable for 15 years. The deficiency of £836 million would be eliminated by a supplementary contribution of 3.15% payable in respect of all members for 15 years commencing 1 April 2009.

Total contribution rate

10.13 Taking into account the supplementary contribution rate, the total contribution rates under the new provisions are 23.65% for existing members as at 1 April 2007 and 23.00% for new entrants after 1 April 2007, payable from 1 April 2009.

Combined contribution rate

10.14 As described earlier in this section, with effect from 1 April 2009, the standard contribution rate payable in respect of existing members (as at 1 April 2007) will differ from that in respect of new entrants. However, SPPA has asked me to derive an appropriate combined standard contribution rate payable over the period 1 April 2009 to 31 March 2012 (the assumed implementation date of the 2009 valuation).

10.15 This combined contribution rate has been determined as the average of the separate contribution rates, weighted by the estimated proportion of the total salary roll payable to the two groups of members, allowing for the gradual growth of new entrants over the period.

10.16 Based on the adjusted contribution rate for existing members (of 20.50%) and the standard contribution rate for new entrants (of 19.85%), both payable from 1 April 2009, the combined standard contribution rate for the period 1 April 2009 to 31 March 2012 is assessed to be 20.40%.

10.17 Taking into account the supplementary contribution of 3.15% payable in respect of all members, the combined total contribution rate for the period 1 April 2009 to 31 March 2012 is assessed to be 23.55%. This contribution rate excludes any additional voluntary contributions payable by members. It also excludes expenses of running and administering the Scheme, which are paid separately by the SPPA.

Effect of change in data from the 2001 valuation to the 2005 valuation

10.18 If the deficit arising as a result of the discrete changes in membership data (see paragraphs 9.13 to 9.18) were to be set aside for the purpose of determining the total contribution rate, then the supplementary contribution rate payable would be 0.90% (instead of 3.15%), and the total contribution rate payable would be 21.30% (instead of 23.55%). That is, the discrete changes to the data account for a supplementary contribution of 2.25%.

10.19 Equivalently, if the balance in the SCAPE account at the 2001 valuation had been determined using data as at 2001 that was consistent with that used for the 2005 valuation, then the balance in the account as at 31 March 2005 would have been higher by about £600 million and the supplementary contribution rate payable would be 0.90% (not 3.15%).

10.20 If Scottish Ministers were to conclude that the appropriate contribution rate should exclude the deficit arising from the discrete data changes, then the total rate payable would be 21.30% with effect from 1 April 2009. This would comprise a standard contribution rate of 20.40% in respect of accruing future liabilities plus 0.90% in respect of the deficit which has arisen since the 2001 valuation.

10.21 SPPA and GAD agree that, at the next valuation of the Scheme (due as at 31 March 2009), it will be necessary to review the membership data taking particular note of the discrete changes identified at this valuation. If it is concluded that the data used for the current valuation is broadly correct, then it would be appropriate to consider adjusting the balance in the SCAPE Account to reflect this. The contribution rate at the next valuation will also need to take account of this review of the data.

Members' and employers' contribution rates

10.22 As noted in paragraph 3.5, as part of a wider agreement relating to long-term financial sustainability, the members' contribution rate payable from 1 April 2007 will be 6.4%. If that were to remain unchanged with effect from 1 April 2009, then the employers' contribution rate payable from 1 April 2009 would be 17.15% (based on the total contribution rate of 23.55%) (paragraph 10.17) or 14.90% if the effect of the data changes were to be set aside (paragraph 10.20).

Future cost sharing

10.23 Future valuations will determine the total contribution rate payable to the STSS although the members' contribution rate may be based on the results of future valuations of the Teachers' Pension Scheme (England and Wales). Employers in the STSS will pay the balance between of the total contribution rate for the STSS less the members' contribution rate.

Sensitivity of results

10.24 Paragraphs 9.22 and 9.23 comment on the sensitivity of the results under the pre-2007 provisions shown in Section 9. The comments apply equally to the results under the new provisions, shown in this section. An additional assumption adopted for this section relates to the assumed proportion of pension commuted under the new taxation regime (as described in paragraphs 8.20 and 8.21).

10.25 If existing members were assumed to commute no additional pension, then this would increase the standard contribution rate by about ¼% of salaries, and also increase the supplementary contribution rate by about ½% of salaries. If existing members were assumed to commute two thirds of the allowable maximum, then this would reduce the standard contribution rate by about ¼% of salaries, and also reduce the supplementary contribution rate by about ½% of salaries.

11 Summary

New provisions

11.1 Under the provisions that came into force on 1 April 2007, the combined standard contribution rate payable in respect of all members is 20.40%, payable from 1 April 2009. (This is based on the adjusted contribution rate for existing members (of 20.50%) and the standard contribution rate for new entrants (of 19.85%), both payable from 1 April 2009.)

11.2 There is a deficiency of £836 million as at 31 March 2005, which would be eliminated by a supplementary contribution of 3.15% of salary payable for 15 years from 1 April 2009. The total combined contribution rate payable from 1 April 2009 is 23.55% of salary.

11.3 A significant element of the deficiency is a result of discrete changes in the membership data. If Scottish Ministers were to conclude that the appropriate contribution rate should exclude the deficit arising from the discrete data changes, then the total rate payable would be 21.30% with effect from 1 April 2009. This would comprise a standard contribution rate of 20.40% in respect of accruing future liabilities plus 0.90% in respect of the deficit which has arisen since the last valuation.

11.4 SPPA and GAD agree that, at the next valuation of the Scheme (due as at 31 March 2009), it will be necessary to review the membership data taking particular note of the discrete changes identified at this valuation. If it is concluded that the data used for the current valuation is broadly correct, then it would be appropriate to consider adjusting the balance in the SCAPE Account to reflect this.

Pre-2007 provisions

11.5 If the Scheme had remained subject to the pre-2007 provisions (and without allowance for additional commutation under the new taxation regime), then the standard contribution rate would have been 20.75%, an increase of 1.25% over the corresponding standard contribution rate recommended in the report on the 2001 valuation.

11.6 There would have been a deficiency of £1,000 million as at 31 March 2005, which would be eliminated by a supplementary contribution of 3.80% of salary payable for 15 years from 1 April 2009. The total contribution rate payable from 1 April 2009 would have been 24.55% of salary.

11.7 If the deficit resulting from the discrete changes in membership data were to be set aside for the purpose of determining the total contribution rate, then the supplementary contribution rate payable would have been 1.55% and the total contribution rate payable would have been 22.30%.

Members' and employers' contribution rates from 1 April 2009

11.8 The members' contribution rate has been set at 6.4% with effect from 1 April 2007. The total recommended rate of contribution payable by employers from 1 April 2009 is therefore 17.15% of salary, or 14.90% if the deficit resulting from the discrete changes in membership data were to be set aside.

11.9 Further to my discussions with SPPA, I understand that SPPA proposes to recommend to Scottish Ministers that the total contribution rate should be 21.30% with effect from 1 April 2009 (comprising members' contributions of 6.4% and employers' contributions of 14.90%).

11.10 Future valuations will determine the total contribution rate payable to the STSS although the members' contribution rate may be based on the results of future valuations of the Teachers' Pension Scheme (England and Wales). Employers in the STSS will pay the balance between of the total contribution rate for the STSS less the members' contribution rate. The contribution rate at the next valuation will also need to take account of the review of the membership data.

TJ Llanwarne FIA

Government Actuary

11 June 2008

Appendix A Summary of pre-2007 provisions

Eligibility for membership

A1 All full-time and part-time teachers in state schools, accepted independent schools, further education colleges and the universities established in 1992 are eligible for membership of the Scheme.

Contributions

A2 Members contribute at the rate of 6% of contributable salary (which includes some allowances but excludes payments in respect of overtime and extra duties). Contributable salary is fully defined in Regulation C1 of the Teachers' Superannuation (Scotland) Regulations 2005.

Retirement age

A3 Pensions are normally payable from age 60 although many members continue to work after that age. Pensions may be payable from age 50 (at the employer's expense) where employment has been terminated prematurely on redundancy or efficiency grounds. Members may take an actuarially reduced pension from age 55.

Benefits on retirement at or after age 60

A4 Subject to a qualifying period of two years, the pension is 1/80th of final pensionable salary per year of service, where final pensionable salary is the best year's pensionable salary in the last three years of service. A lump sum of three times the pension is also payable.

Benefits on retirement due to ill-health

A5 On retirement due to ill-health with more than two years' service, an immediate enhanced pension is payable. A lump sum of three times the pension is also payable.

Lump sum on death in service

A6 On death in service, a lump sum is payable of two times annual pensionable salary.

Benefits on withdrawal

A7 A member who leaves with less than two years' service may take a refund of contributions (those made by the member not the employer) with interest at any time before age 60. A member who leaves with greater than two years' service is entitled to a preserved pension payable from age 60 together with a lump sum of three times the pension payable at age 60.

A8 On re-entry to the Scheme, earlier service may be aggregated with the new period of service for the purpose of calculating benefits at retirement provided that the member has not taken a refund of contributions or transfer value.

Partners' and children's benefits

A9 When a member dies after retirement, a pension is payable to a surviving spouse or civil partner. The pension is 1/160th of pensionable salary per year of service. (For widows, the member's service after 31 March 1972 reckons towards the widow's pension. For widowers and civil partners, only service after 5 April 1988 is reckonable.) On death in service, a higher short term pension and then an enhanced pension are payable. On death after retirement, a higher short term pension is payable and a supplementary grant may also be payable. Children's pensions are payable in respect of dependent children.

Pension increases

A10 Pensions in payment and preserved benefits are subject to the provisions of the Pensions (Increase) Act 1971, and so, in general, are increased in line with price increases.

Appendix B Summary of new provisions for existing members

Eligibility for membership

B1 All full-time and part-time teachers in state schools, accepted independent schools, further education colleges and the universities established in 1992 are eligible for membership of this section of the Scheme, provided that they join before 1 April 2007. This section of the Scheme closed to new entrants from 1 April 2007.

Contributions

B2 Members contribute at the rate of 6.4% of contributable salary (which includes some allowances but excludes payments in respect of overtime and extra duties). Contributable salary is fully defined in Regulation C1 of the Teachers' Superannuation (Scotland) Regulations 2005. The member contribution rate may change in future as a result of the agreed cost sharing arrangements.

Retirement age

B3 Pensions are normally payable from age 60 although many members continue to work after that age. Until 2010, pensions may be payable from age 50 (at the employer's expense) where employment has been terminated prematurely on redundancy or efficiency grounds; from 2010, the minimum age will be 55. Members may take an actuarially reduced pension from age 55.

Benefits on retirement at or after age 60

B4 Subject to a qualifying period of two years, the pension is 1/80th of final pensionable salary per year of service, where final pensionable salary is the better of the last year's pensionable salary and the average of the best three consecutive years' pensionable salary in the last ten years of service. A lump sum of three times the pension is also payable. Members may commute up to 20% of their pension at a rate of £12 cash for £1 pension to receive additional lump sum.

Benefits on retirement due to ill-health

B5 On retirement due to ill-health with more than two years' service, an immediate pension is payable. Members suffering total incapacity will receive an enhanced pension based on actual service increased by one half of the prospective service to age 60. There is no enhancement to the service of members suffering partial incapacity but the pension is not reduced for early payment. Members may commute up to 20% of their pension at a rate of £12 cash for £1 pension to receive additional lump sum.

Lump sum on death in service

B6 On death in service, a lump sum is payable of three times' annual pensionable salary.

Benefits on withdrawal

B7 A member who leaves with less than two years' service may take a refund of contributions (those made by the member not the employer) with interest at any time before age 60. A member who leaves with greater than two years' service is entitled to a preserved pension payable from age 60 together with a lump sum of three times the pension payable at age 60.

B8 On re-entry to the Scheme, earlier service may be aggregated with the new period of service for the purpose of calculating benefits at retirement provided that the member has not taken a refund of contributions or transfer value. If the break in service is greater than five years then the service after re-entry would be in the new entrant scheme described in Appendix C. The benefits relating to the service in the current scheme will still be linked to final salary.

Partners' and children's benefits

B9 When a member dies after retirement, a pension is payable to a surviving partner. The pension is 1/160th of pensionable salary per year of service. (For widows, the member's service after 31 March 1972 reckons towards the widow's pension. For widowers and civil partners, only service after 5 April 1988 is reckonable. For nominated unmarried partners, only service after 1 April 2007 is reckonable.) On death in service, a higher short term pension and then an enhanced pension are payable. On death after retirement, a higher short term pension is payable and a supplementary grant may also be payable. Children's pensions are payable in respect of dependent children.

Pension increases

B10 Pensions in payment and preserved benefits are subject to the provisions of the Pensions (Increase) Act 1971, and so, in general, are increased in line with price increases.

Appendix C Summary of new provisions for new entrants

Eligibility for membership

C1 All new entrant full-time and part-time teachers in state schools, accepted independent schools, further education colleges and the universities established in 1992 are eligible for membership of this section of the Scheme. New entrants are defined as those who first join the Scheme after 31 March 2007. Existing members who return to service after 31 March 2008 following a break of more than five years will also be subject to new provisions.

Contributions

C2 Members contribute at the rate of 6.4% of contributable salary (which includes some allowances but excludes payments in respect of overtime and extra duties). Contributable salary is fully defined in Regulation C1 of the Teachers' Superannuation (Scotland) Regulations 2005. The member contribution rate may change in future as a result of the agreed cost sharing arrangements.

Retirement age

C3 Pensions are normally payable from age 65 although members may continue to work after that age. Pensions may be payable from age 55 (at the employer's expense) where employment has been terminated prematurely on redundancy or efficiency grounds. Members may take an actuarially reduced pension from age 55.

Benefits on retirement at or after age 65

C4 Subject to a qualifying period of two years, the pension is 1/60th of final pensionable salary per year of service, where final pensionable salary is the better of the last year's pensionable salary and the average of the best three consecutive years' pensionable salary in the last ten years of service. Members may commute up to 35% of their pension at a rate of £12 cash for £1 pension to receive a lump sum. Benefits taken after age 65 will be actuarially enhanced.

Benefits on retirement due to ill-health

C5 On retirement due to ill-health with more than two years' service, an immediate pension is payable. Members suffering total incapacity will receive an enhanced pension based on actual service increased by half of the prospective service to age 65. There is no enhancement to the service of members suffering partial incapacity but the pension is not reduced for early payment. Members may commute up to 35% of their pension at a rate of £12 cash for £1 pension to receive a lump sum.

Lump sum on death in service

C6 On death in service, a lump sum is payable of three times' annual pensionable salary.

Benefits on withdrawal

C7 A member who leaves with less than two years' service may take a refund of contributions (those made by the member not the employer) with interest at any time before age 65. A member who leaves with greater than two years' service is entitled to a preserved pension payable from age 65. Members may commute up to 35% of their pension at a rate of £12 cash for £1 pension to receive a lump sum.

C8 On re-entry to the Scheme, earlier service may be aggregated with the new period of service for the purpose of calculating benefits at retirement provided that the member has not taken a refund of contributions or transfer value.

Partners' and children's benefits

C9 When a member dies, a pension is payable to a surviving partner. The pension is 1/160th of pensionable salary per year of service. On death in service, a higher short term pension and then an enhanced pension are payable. On death after retirement, a higher short term pension is payable and a supplementary grant may also be payable. Children's pensions are payable in respect of dependent children.

Pension increases

C10 Pensions in payment and preserved benefits are subject to the provisions of the Pensions (Increase) Act 1971, and so, in general, are increased in line with price increases.

Appendix D SCAPE Account 1 April 2001 to 31 March 2005

Table D1 – Consolidated SCAPE Account, 1 April 2001 to 31 March 2005

	£ million
Balance at 1 April 2001	**10,769**
Income	
Member contributions	492
Employer contributions	785
Total contributions	1,277
Transfers, CEPs & miscellaneous	83
Return on SCAPE account	2,704
Total income	4,064
Outgo	
Benefits (including pension increases)	1,731
Refunds, transfers, CEPs	72
Total outgo	1,803
Balance at 31 March 2005	**13,030**

Table D2 – Annual breakdown of income and outgo, 1 April 2001 to 31 March 2005

(£ million)

	Year ending 31 March			
	2002	**2003**	**2004**	**2005**
Balance at start of year	10,769	11,198	11,624	12,301
Income				
Member contributions	113	120	126	133
Employer contributions	127	138	253	267
Total contributions	240	258	379	400
Transfers, CEPs & other income	21	15	26	21
Return on SCAPE account	562	587	737	818
Total income	823	860	1,142	1,239
Outgo				
Benefits (including pension increases)	379	419	444	489
Refunds, transfers, CEPs	15	15	21	21
Total outgo	394	434	465	510
Balance at end of year	11,198	11,624	12,301	13,030

Appendix E Membership data

This Appendix shows the data used for the 2001 valuation and the data used for the 2005 valuation (after adjustments agreed by GAD and SPPA).

Table E1 – Active membership as at 31 March 2001

	Number	Total salaries * £ million	Average service years	Average age years
Men	20,207	622	17.9	46.8
Women	48,460	1,312	13.4	44.5
Total	68,667	1,934	14.7	45.2

* Full-time equivalent. Payable from 1 April 2001

Table E2 – Active membership as at 31 March 2005

	Total salaries † £ million	Average service years	Average age years
Men	712	17.8	47.3
Women	1,675	13.8	44.9
Total	2,387	14.9	45.6

† Full-time equivalent. Payable from 1 April 2005

The number of active members is not shown due to the adjustments made to the total salary roll (paragraph 4.7)

Table E3 – Pensions in payment, 2001 and 2005

Retirement category	31 March 2001		31 March 2005	
	Number	Annual pensions * £ million	Number	Annual pensions † £ million
Age and premature				
Men	11,608	120.7	12,768	148.9
Women	20,157	143.7	22,624	180.9
Ill-health				
Men	2,062	20.9	2,290	25.6
Women	4,022	31.9	4,565	41.0
Spouses**	4,005	12.7	4,701	16.9
Total (excl. children)	**41,854**	**329.9**	**46,948**	**413.3**

* including pension increases payable from April 2001 (note that the 2001 report shows the pension amounts excluding these increases)

† including pension increases payable from April 2005

**long term spouses pension only

Table E4 – Deferred members, 2001 and 2005

	31 March 2001		31 March 2005	
	Number	Total deferred pensions * £ million	Number	Total deferred pensions † £ million
Men	3,157	10.2	3,599	17.7
Women	10,812	22.3	11,201	36.5
Total	13,969	32.5	14,800	54.2

* including increases applying from April 2001

† including increases applying from April 2005

Appendix F Demographic experience and basis

F1 This Section considers the demographic experience over the period 1 April 2001 to 31 March 2005, and describes the demographic assumptions adopted for the current review.

Pensioner mortality after age and premature retirement

F2 Existing age retirement pensioners may have retired at age 60 (or over) or retired prematurely (taking early or premature retirement) at age 50 (or over).

F3 At the 2001 valuation, the mortality assumptions adopted for this group were based on unadjusted standard mortality tables published by the Faculty and Institute of Actuaries, known as PMA92 (men) and PFA92 (women). The tables include allowance for future mortality improvement.

F4 For females, the mortality experience of female pensioners over the period 2001-2005 was broadly in line with the mortality assumptions adopted for the previous review. For males, mortality experience over the period 2001 – 2005 was lighter than that assumed for the previous review (which implies that males have experienced greater longevity than assumed). As a consequence of this, an additional reduction of one year of age has been applied to the assumed mortality for all male pensioners, widowers and future widowers of existing pensioners.

F5 At this valuation, the assumed mortality rates for existing pensioners are in accordance with the standard PMA92 and PFA92 tables with a reduction of one year of age for men and no adjustment for women. The assumed life expectancy at age 60 of existing pensioners is 25½ years for men and 27½ years for women.

F6 Since the 2001 valuation, the actuarial profession and other bodies have continued to discuss and project future levels of mortality improvement. The broad consensus is that younger people will be subject to greater levels of future improvement than has previously been assumed, and than is incorporated in the standard PMA92 and PFA92 tables. At the current valuation, I have therefore included allowance for future mortality improvement broadly consistent with that included in the UK 2004-based population projections which, for future pensioners (ie existing (active and deferred) members and new entrants) produces greater allowance for future mortality improvement than the standard tables.

F7 For existing active and deferred members, the mortality rates in the standard tables have been projected to the calendar year 2045 with a reduction of one and a half years of age for men and half a year of age for women. The assumed life expectancy at age 60 of existing active and deferred members is 27½ years for men and 29½ years for women. Table G1 of Appendix G shows assumed mortality rates for future age retirement pensioners at specimen ages.

F8 For future new entrants, the mortality rates in the standard tables have been projected to the calendar year 2045 with a reduction of two years of age for men and one year of age for women. The assumed life expectancy at age 60 of future new entrants is 28 years for men and 30 years for women.

Pensioner mortality after ill-health retirement

F9 Existing ill-health pensioners retired before attaining age 60, due to ill-health. The mortality experience of ill-health pensioners over the period 2001-2005 was broadly in line with that assumed for the 2001 valuation

F10 The mortality of ill-health pensioners is expected to be heavier than that of age retirement pensioners. Under the new provisions, there are two tiers of ill-health retirement. We expect the mortality of the two groups of future ill-health pensioners to differ but I have assumed that the overall mortality of future ill-health pensioners under the new provisions will be the same as if the pre-2007 ill-health provisions had remained in force. The data for future valuations should provide evidence to assess the mortality differential between the two tiers of ill-health retirements.

F11 The assumed mortality of existing ill-health pensioners is based on the standard PMA92 and PFA92 tables with adjustments to reflect the recent experience. The assumed mortality rates for existing ill-health pensioners are based on the standard PMA92 and PFA92 tables with an increase of two years of age for both men and women. The assumed life expectancy at age 60 of existing ill-health pensioners is 19½ years for men and 23½ years for women.

F12 The assumed mortality rates for future pensioners are similar although the adjustments differ slightly and the rates include allowance for additional future mortality improvement. As at the previous valuation, we have assumed that ill-health retirement pensioners are subject to heavier mortality in the years immediately after retirement than those of the same age who have been retired for some time. It has been assumed that, for men, mortality in the first year after retirement will be 50% greater than for those of the same age who have been retired more than one year. For women, it has been assumed that mortality in the first year after retirement will be 100% greater in the first year, and 50% greater in the second year, than for those of the same age who have been retired for two years or more. The assumed life expectancy of current actives retiring on ill-health at age 55 is 24½ years for men and 28 years for women.

F13 For new entrants, the assumed mortality is as for current actives but with an additional reduction of one half of a year of age. The assumed life expectancy of new entrants retiring on ill-health at age 55 is 25 years for men and 28½ years for women.

F14 Table G1 of Appendix G shows assumed mortality rates for future ill-health pensioners at specimen ages.

Spouses' and partners' mortality

F15 At the 2001 valuation, the mortality assumptions adopted for (then) existing widows were based on standard mortality tables published by the Faculty and Institute of Actuaries, known as WA92, which also includes allowance for future mortality improvement. The published tables were adjusted to take account of the Scheme's experience by a reduction of one year of age (which implied greater longevity than the unadjusted standard tables). For widowers, the mortality assumptions adopted at the 2001 valuation were the same as for male pensioners after retirement (the standard table PMA92, with no adjustment).

F16 At this valuation the assumed mortality rates for existing widows (and future widows of existing pensioners) are in accordance with the standard WA92 tables but with a reduction of one year of age. The assumed mortality rates for existing widowers (and future widowers of existing pensioners) are in accordance with the standard PMA92 tables but with a reduction of one year of age.

F17 For future widows of existing active and deferred members, the mortality rates in the WA92 table have been projected to the calendar year 2045 with a reduction of one and a half years of age. For future widowers of existing members, the mortality rates in the PMA92 table have been projected to the calendar year 2045 with a reduction of one and a half years of age. Table G1 of Appendix G shows assumed mortality rates for future spouses of existing members at specimen ages. The assumed mortality of future spouses of new entrants includes allowance for additional improvement by means of a further reduction of one half of a year of age.

F18 It has been assumed that female partners' will be subject to the same mortality as widows and male partners the same mortality as widowers.

Proportions eligible for spouses' and partners' benefits

F19 The proportions married assumed at the 2001 valuation were retained for this valuation.

F20 There is no available data on which to base the assumed proportions eligible for partners' benefits under the new provisions, and so this assumption has been set by reference to other sources relating to the wider population. Table G2 of Appendix G shows the assumed proportions married and proportions married or partnered at specimen ages.

Active members

F21 Paragraphs F22 to F35 discuss the demographic assumptions adopted in order to determine the standard contribution rate and to value the liabilities of active members.

In-service decrements

F22 The pensioner valuation data includes information on the age at which pensions commenced for current pensioners. It shows that most people chose to take age retirement at or around age 60 (NRA), although a proportion opted for early retirement or retired after age 60.

F23 We could not analyse the age retirement rates due to uncertainties in the active member data. However, data on commencement of pensions suggests that a greater proportion of the active membership retired on or before age 60 than assumed at the 2001 valuation (which did not include any explicit allowance for early retirements).

F24 Under the pre-2007 provisions and the new provisions for existing members, the assumed rates of age retirement from 60 to 65 are unchanged from the 2001 valuation. However, allowance has also been included for future premature retirements and early retirements with actuarially reduced benefits from age 55 to age 59 (although both are broadly cost neutral to the Scheme). By allowing for early retirements in this way, the average age of retirement in normal health is assumed to be slightly lower than assumed at the 2001 valuation.

F25 Under the new provisions for new entrants, allowance has been included for future premature retirements and early retirements with actuarially reduced benefits from age 60 to age 64 (although both are broadly cost neutral to the Scheme). Members still in active service are assumed to retire on attaining age 65. (No allowance is included for members retiring after age 65 since such members will receive actuarially enhanced benefits that are broadly cost neutral to the Scheme.)

F26 Table G3 of Appendix G shows the assumed rates of age and early retirement from active service for members with NPA 60 and NPA 65.

F27 Under the new provisions (from 1 April 2007), there will be two tiers of ill-health retirement. It was not possible to analyse the ill-health retirement rates and so we have assumed that the overall rates of ill-health retirement will be the same as those adopted at the 2001 valuation, for both men and women. The SPPA has asked me to assume that two thirds of members taking ill-health retirement after 1 April 2007 will be eligible for the higher tier of benefits. Tables G4 and G5 of Appendix G show the assumed rates of ill-health retirement at specimen ages for members with NPA 60 and NPA 65 respectively.

F28 At this valuation, the assumed rates of death in service for men and women are lower than assumed at the 2001 valuation (reflecting the general trend of improving longevity over time). Tables G4 and G5 of Appendix G show the assumed rates of death in service at specimen ages for members with NPA 60 and NPA 65 respectively.

F29 We have been unable to analyse withdrawal experience since the 2001 valuation. Therefore, the assumed withdrawal rates for both men and women are the same as adopted for the 2001 valuation. Withdrawal rates tend to be higher in the early years of service and to fall as service increases. For both men and women, I have assumed that higher withdrawal rates will apply in the first two years of service than apply to members of the same age with more than two years' service.

F30 Tables G4 and G5 of Appendix G show the assumed withdrawal rates at specimen ages for members with more than two years' service and with NPA 60 and NPA 65 respectively. Table G6 of Appendix G shows withdrawal rates at specimen ages for members with less than two years' service.

F31 A member may re-enter the Scheme after previous withdrawal. On re-entry, a member may aggregate the earlier period of service with the service subsequent to re-entry (except that an existing member who re-enters service after a break of more than 5 years would be treated as a new entrant for future accrual). It is assumed that, of members who first withdraw from service more than 10 years before normal pension age, about one half of women and one fifth of men will re-enter service, on average, about five years after withdrawal. The benefits in respect of both periods of service are based on the salary at the final date of exit. I have assumed that other deferred members receive benefits at normal pension age.

Progression of average salary with age

F32 In addition to the allowance for general increases in salary (see paragraph 7.3), the valuation also includes allowance for increases in salary arising from increments and promotion. We have been unable to analyse the promotional salary increases since 31 March 2001 and so, for both men and women, the assumed promotional scale is the same as that adopted for the 2001 valuation. Table G7 of Appendix G shows the promotional salary scale at specimen ages. For members who have a break in service between the valuation date and the date that benefits come into payment, it is assumed that the final pensionable salary will be lower than if service had been continuous.

Entry age

F33 For the purpose of calculating the new entrant standard contribution rate (see Section 9), I have assumed that new entrants join the Scheme at a range of ages with an average of about age 34 for men and age 33 for women. It is assumed that about 70% of new entrants are female. These are the same assumptions as adopted at the previous valuation

Commutation

F34 Under the new provisions and the new taxation regime, new entrants after 1 April 2007 (with a 1/60th pension) will be allowed to commute up to 35% of the 1/60th pension for additional lump sum, at a rate of 12:1. I have assumed that new entrants will, on average, commute about 25% of the 1/60th pension: this is equivalent to assuming commutation of a lump sum equal to 3/80th plus one third of the additional allowable maximum above that 3/80th lump sum.

F35 Under the new provisions and the new taxation regime, existing members (with a 1/80th pension and an 3/80th lump sum) will be allowed to commute up to 20% of the 1/80th pension for additional lump sum, at a rate of 12:1, with effect from 1 April 2007. I have assumed that existing members will, on average, commute about 6½% of the 1/80th pension: that is, about one third of the allowable maximum. This is consistent with the assumption adopted for new entrants.

Appendix G Demographic assumptions

Table G1 – Assumed rates of mortality after retirement

(of existing active and deferred members)

Age	Age (or premature) retirement		Ill-health retirement (more than two years)		Spouses and partners	
	Men	Women	Men	Women	Widows	Widowers
25			.0101	.0050	.0001	.0001
30			.0101	.0051	.0002	.0001
35			.0101	.0051	.0002	.0001
40			.0101	.0051	.0003	.0001
45			.0102	.0052	.0005	.0001
50			.0104	.0054	.0007	.0002
55	.0005	.0005	.0108	.0058	.0011	.0005
60	.0010	.0010	.0119	.0069	.0017	.0010
65	.0027	.0026	.0153	.0098	.0033	.0027
70	.0071	.0062	.0228	.0157	.0066	.0071
75	.0164	.0133	.0376	.0266	.0126	.0164
80	.0341	.0264	.0636	.0455	.0231	.0341
85	.0643	.0482	.1048	.0755	.0407	.0643
90	.1106	.0821	.1630	.1192	.0700	.1106
95	.1737	.1303	.2364	.1780	.1170	.1737
100	.2507	.1935	.3190	.2503	.1899	.2507

Table G2 – Assumed proportions married and proportions married or partnered

Age	Accrual before 1/4/2007		Accrual after 1/4/2007	
	Proportion married		Proportion married or partnered	
	Men	Women	Men	Women
25	0.26	0.27	0.29	0.34
30	0.42	0.37	0.46	0.47
35	0.51	0.46	0.56	0.58
40	0.59	0.53	0.66	0.67
45	0.68	0.58	0.76	0.73
50	0.77	0.62	0.85	0.78
55	0.84	0.62	0.93	0.78
60	0.87	0.60	0.96	0.75
65	0.86	0.56	0.95	0.71
70	0.84	0.50	0.93	0.63
75	0.80	0.41	0.88	0.52
80	0.72	0.29	0.79	0.36
85	0.59	0.17	0.65	0.21
90	0.41	0.07	0.45	0.09
95	0.23	0.02	0.26	0.03
100	0.10	0.00	0.11	0.00

Table G3 – Assumed rates of early retirement (with ARB) and age retirement

Age	NPA 60		NPA 65	
	Men	Women	Men	Women
55	0.06 *	0.06 *	-	-
56	0.07 *	0.07 *	-	-
57	0.08 *	0.08 *	-	-
58	0.09 *	0.09 *	-	-
59	0.10 *	0.10 *	-	-
60	0.11	0.31	0.06 *	0.06 *
61	0.12	0.31	0.07 *	0.07 *
62	0.14	0.27	0.08 *	0.08 *
63	0.17	0.25	0.09 *	0.09 *
64	0.57	0.60	0.10 *	0.10 *
65	0.98	0.98	1.00 †	1.00 †
66	1.00	1.00		

* early retirement with Actuarially Reduced Benefits (ARB)

† Benefits taken after age 65 will be subject to actuarial enhancement

Table G4 – Assumed rates of death in service, withdrawal and ill-health retirement (NPA 60)

Age	Death in service		Withdrawal (at least 2 years' service)		Ill-health retirement	
	Men	Women	Men	Women	Men	Women
25	.0003	.0002	.0215	.0760	.0001	.0003
30	.0004	.0002	.0179	.0560	.0003	.0005
35	.0006	.0003	.0149	.0325	.0006	.0010
40	.0008	.0005	.0126	.0180	.0015	.0016
45	.0012	.0007	.0113	.0143	.0031	.0034
50	.0017	.0011	.0103	.0133	.0079	.0097
55	.0028	.0015	.0086	.0123	.0148	.0205
60	.0046	.0020	.0000	.0000	.0000	.0000

Table G5 – Assumed rates of death in service, withdrawal and ill-health retirement (NPA 65)

Age	Death in service		Withdrawal (at least 2 years' service)		Ill-health retirement	
	Men	Women	Men	Women	Men	Women
25	.0003	.0002	.0215	.0760	.0001	.0003
30	.0004	.0002	.0179	.0560	.0003	.0005
35	.0006	.0003	.0149	.0325	.0006	.0010
40	.0008	.0005	.0126	.0180	.0015	.0016
45	.0012	.0007	.0113	.0143	.0031	.0034
50	.0017	.0011	.0103	.0133	.0079	.0097
55	.0028	.0015	.0086	.0123	.0148	.0205
60	.0046	.0020	.0084	.0122	.0219	.0324
65	.0074	.0031	.0000	.0000	.0000	.0000

Table G6 – Assumed rates of withdrawal during first 2 years

Age	Rate of withdrawal in first year of service		Rate of withdrawal in second year of service	
	Men	Women	Men	Women
25	0.09	0.11	0.07	0.09
30	0.09	0.11	0.08	0.10
35	0.09	0.08	0.07	0.06
40	0.09	0.07	0.06	0.05
45	0.09	0.08	0.06	0.05
50	0.09	0.10	0.06	0.06
55	0.10	0.12	0.07	0.06

Table G7 – Assumed salary scale for active members

Age	Salary scale	
	Men	Women
25	100	100
30	126	125
35	153	147
40	169	156
45	180	161
50	188	166
55	192	169
60	193	170
65	193	170