GOVERNMENT ACTUARY'S DEPARTMENT

Firefighters' Pension Schemes in England
Actuarial valuation as at 31 March 2007

Date: 23 October 2009

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Table of Contents

1	Introduction and summary	3
2	Scheme provisions and benefits	6
3	Membership data	7
4	Valuation methodology	11
5	Experience analysis and demographic assumptions	12
6	Results of the valuation	20
7	Sensitivity analysis	24
8	Conclusions	25
Annex A – Summary of membership data		26
Annex B – Summary of data by authority		28
Annex C – Ill-health retirements and withdrawals by authority		29
Annex D – Summary of assumptions		30
Annex E – Summary of benefits		32

1 Introduction and summary

1.1 At the request of the Department for Communities and Local Government ("DCLG") on behalf of the Secretary of State, I have carried out an actuarial assessment of the Firefighters' Pension Schemes. I have carried out assessments of both the Firefighters' Pension Scheme 1992 ("FPS") and the New Firefighters' Pension Scheme ("NFPS") as at 31 March 2007.

1.2 Under section G2 of the Firemen's Pension Scheme Order 1992 (in connection with the FPS) and Part 13, Rule 2 of the Firefighters' Pension Scheme Order 2006 (in connection with NFPS), the Secretary of State is required to determine and notify Fire Authorities of the contribution they are required to make towards the discharge of their future liability for the payment of pensions under the Schemes in England.

1.3 The main purpose of the valuation is to assist the Secretary of State in making the above determinations and, in particular, to:

- review the demographic experience of the Schemes;
- assess the cost of benefits accruing to Firefighters in the future; and
- place a value on the benefits accrued by Firefighters in respect of service up to the valuation date.

1.4 This is the first formal valuation of the Firefighters' pension arrangements for over 15 years. As part of the process of introducing the NFPS, an assessment of Scheme costs was carried out by GAD in 2004 (the "2004 costing exercise").

1.5 This report has been prepared for DCLG on behalf of the Secretary of State, and must not be reproduced distributed or communicated in whole or in part to any other person without GAD's written permission.

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The valuation exercise

1.7 The Firefighters' Pension Schemes are unfunded and, historically, there are no assets or reserves (real or notional) held to meet future benefit payments. Moving forward from this valuation date, I understand that there is an intention to establish a notional pool of assets equal to the Schemes' liabilities as at the valuation date and, in future, to track the experience of that pool of assets in line with the SCAPE (superannuation charge adjusted for past experience) approach to funding, as adopted by other large unfunded public sector pension schemes.

1.8 The intention to establish a SCAPE mechanism for the Firefighters' Pension Schemes in the future has not had an impact on the conduct of this valuation exercise. However, the valuation methodology adopted for this valuation is consistent with the SCAPE approach and the results of this exercise may subsequently be used to form a base from which SCAPE can be introduced into the Firefighters' Pension Schemes.

Main assumptions and experience

1.9 Assumptions are needed for financial factors and demographic factors such as rates of mortality, retirement and withdrawal. Compared with the 2004 costing exercise, greater longevity of members has been assumed. The main financial assumptions used for valuing liabilities are that investment yields over the long term will exceed general increases in earnings by 2% a year, and will exceed price increases by 3.5% a year.

1.10 As part of our investigation, we have analysed mortality, retirement patterns (ill health and age), voluntary withdrawal, salary progression and commutation of pension for cash at retirement. The main findings of our review were:

- Pensioner longevity is increasing
- There were fewer ill health retirements than expected
- There were more voluntary withdrawals than expected
- There is evidence to suggest that the average age of new entrants to the Scheme is increasing and that an increasing proportion of entrants are female.

Main results

1.11 The cost of benefits accruing for each year of membership is assessed as 37.7% of pensionable pay for FPS members and 23.7% of pensionable pay for NFPS members. In each case, the rates quoted are before deduction of members' contributions. Combining these rates over the 4 years following the valuation date, and weighting by the expected payroll in each scheme over that period, would give a combined cost of 36.5% (excluding expenses). All other things being equal, this combined rate can be expected to fall at successive valuations as the number of Firefighters in the NFPS increases.

1.12 The figures in 1.11 above compare (excluding expenses) with an assessed cost of 37.5% of pensionable pay for FPS members and 22.7% of pensionable pay for NFPS members, arising from the 2004 costing exercise. The increase in rates is attributable to a number of factors, most notably improving pensioner longevity.

1.13 The Schemes' respective regulations state that the contribution rate payable by Fire Authorities is determined by the Secretary of State and, as such, this report does not make a formal employer contribution rate recommendation.

1.14 The value of liabilities accrued up to the valuation date is assessed as £13.8 billion.

1.15 This report has been prepared in accordance with the requirements of Guidance Note GN9 (version 8.1) issued by Board for Actuarial Standards, except that the solvency position on possible discontinuance of the Schemes has not been investigated as they are unfunded and the provision of benefits does not depend specifically on the amount of any accumulated assets.

Ian Boonin 23 October 2009

Fellow of the Institute of Actuaries

2 Scheme provisions and benefits

2.1 The provision of pension benefits for Firefighters was established by the Firemen's Pension Scheme Order 1992 (the FPS or 1992 Scheme). The legislation prescribes the level of benefits and the circumstances in which the benefits are payable to former members and their dependants. In particular, the FPS provides a combination of pension and lump sum benefits (lump sum by commutation of pension) on a range of contingencies: retirement, death and resignation. These benefits are related to each individual's salary on leaving the scheme and pensions payable are increased annually in line with the rise in the Retail Prices Index after leaving service, payable from age 55.

2.2 With effect from 5 April 2006, the FPS was closed to new entrants (although accrual for exiting members continues) and a new scheme established (the NFPS) with a normal retirement age of 60. Retained Firefighters (employees who are "on call" to respond to emergencies) were allowed to join the NFPS with effect from 6 April 2006. Prior to this date Retained Firefighters did not have access to the Firefighters' Pension Schemes. Retained Firefighters are permitted to backdate their service to 6 April 2006, or to their date of joining, whichever is the later. The Scheme's governing regulations contain no provision for discretionary increases and none have been allowed for in this assessment).

2.3 Members contribute to the Schemes at the rate of 11.0% of pensionable pay in the FPS and 8.5% of pensionable pay in the NFPS. From 1 April 2006, Fire Authorities have paid contributions at the rate of 21.3% of pensionable pay for the FPS and 11% of pensionable pay for the NFPS, plus a multiple of pay for each ill-health retirement. These rates were recommended as part of the 2004 Costing exercise. There is a further option to pay Additional Voluntary Contributions (AVCs) which are invested on a money purchase basis. The liability in respect of AVCs is matched by the contributions paid, and so none have been allowed for in this assessment.

2.4 The broad structure of the pension arrangements now in place for members is summarised in Annex E.

The 2004 costing exercise

2.5 The most recent review of the cost of Firefighters' pensions was carried out in 2004 prior to the introduction of the NFPS. The annual cost of providing benefits under the FPS was assessed as being 37.5% of pensionable pay. With effect from 5 April 2006 the FPS was closed to new entrants and the NFPS was established with effect from 6 April 2006. In the absence of experience that could be used to determine an ongoing contribution rate to the NFPS, a cost range was quoted based on a possible range of voluntary withdrawal experience that might be observed in the NFPS. The cost range was 21.2% to 24.2% of pensionable pay, with a midpoint of 22.7%. This figure was subsequently quoted in the proposal to introduce the NFPS.

3 Membership data

3.1 For this review I have been provided with membership data from the 46 Fire Authorities in England. I have been supplied with data for active members in service as at 31 March 2007, together with data for former members entitled to deferred or immediate pensions. Data was also provided in respect of members who had ceased to be serving members of the FPS or NFPS during the years 31 March 2003 to 31 March 2007, through normal retirement, ill health retirement, withdrawal, transfer out or death.

3.2 Responsibility for the accuracy of the membership data provided rests with the Fire Authorities who supplied it. GAD has not undertaken detailed checks on the individual membership data supplied. Some validity and reasonableness checks have however been carried out on the data supplied and, overall, we are satisfied that it is not unreasonable to use the data provided to carry out a review of the cost of Firefighters' pensions. A summary of the data supplied by each authority is given in Annexes A and B.

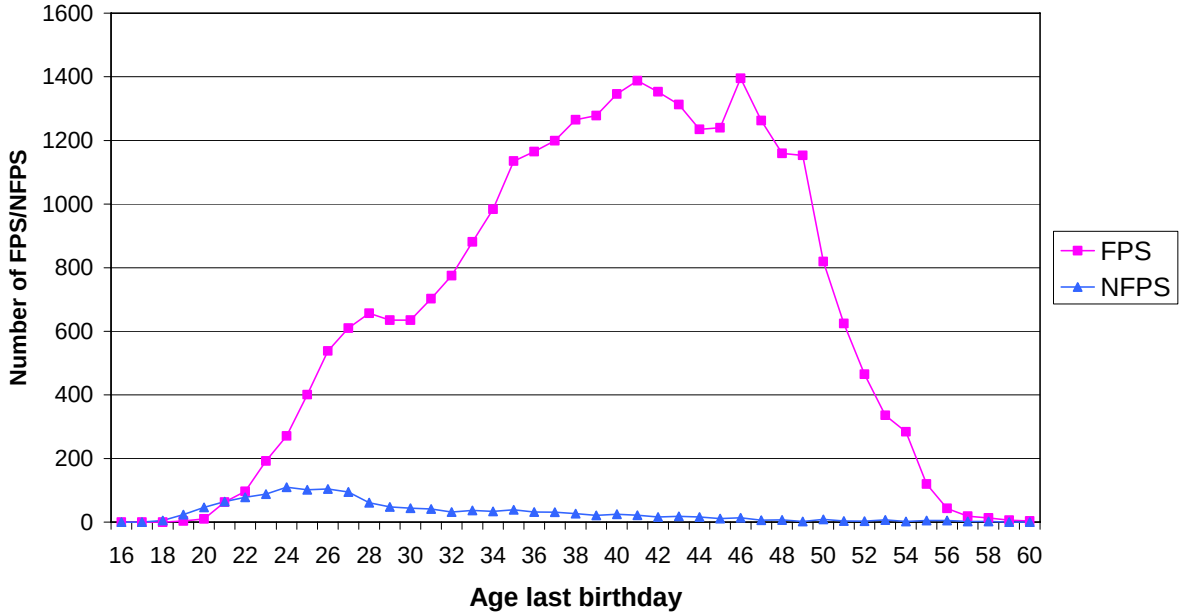
Firefighters - by age

3.3 In total there were 33,533 members of the Firefighters' Pension Schemes as at 31 March 2007. Of these 30,413 were regular Firefighters (including whole and part-time regulars) and 3,120 were Retained Firefighters. Of the regular members, 29,074 were members of the FPS and 1,339 were members of the NFPS, the latter representing just over 4% of serving regular Firefighters. The average age of members of the FPS was 40 years and the average age of members in the NFPS was 36 years (including Retained Firefighters who are generally older than regular NFPS Firefighters).

3.4 Figure 1 below shows the numbers of regular Firefighters by age and scheme.

Figure 1

Regular Firefighters by age



Regular Firefighters - by gender

3.5 Out of 30,413 regular Firefighters, 814 were female, which represents 2.7% of the total. Their average reckonable service was 6.6 years. Of the 5,300 regular Firefighters with less than 5 years service, 7.3% were female. Although the numbers in service will not exactly reflect recruitment patterns (because different numbers of males and females may leave during their first 5 years of service) there appears, in recent years, to have been an increase in the recruitment of female Firefighters.

Regular Firefighters - by age of entry

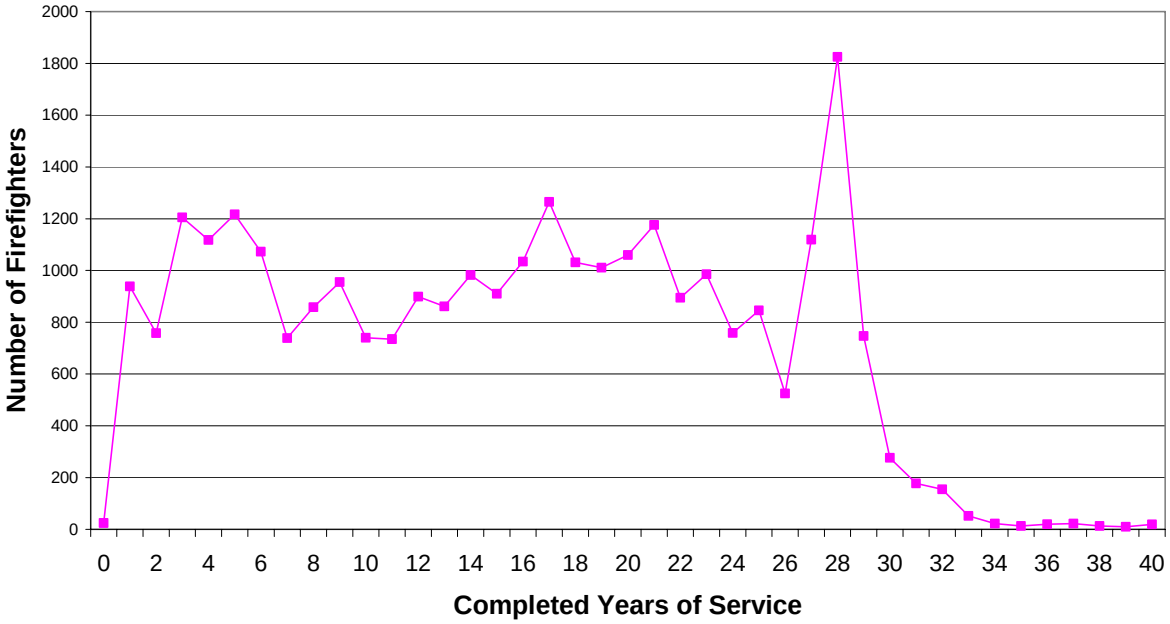
3.6 The average entry age of members who have joined the Schemes since 2004 was 28 years, whereas the average entry age of the entire membership was 25 years. This may indicate that Firefighters are, on average, joining the Service at older ages than previously.

Regular Firefighters - by years of service

3.7 Figure 2 shows the distribution of regular Firefighters by years of service in the FPS. 8% of members of the FPS have the right to retire immediately with unreduced benefits. 1,825 members had accrued 28 years service as at 31 March 2007 and will attain the maximum 30 years service by 31 March 2009.

Figure 2

FPS Firefighters by Service



3.8 As the NFPS had only been in operation for one year at the valuation date, it is not meaningful to analyse the membership of the NFPS by years of service.

Retained Firefighters

3.9 As part of the data collection exercise, all but four Fire Authorities provided data on Retained Firefighters. The data showed that 3,120 Retained Firefighters had exercised their option to join the NFPS, which represents 70% of the NFPS membership. The age distribution of retained fire-fighters is shown in the table below and is not dissimilar to that of the FPS.

Age last birthday	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55 & over	Total
Number	51	265	293	407	635	636	480	259	94	3,120
Proportion	1.6%	8.5%	9.4%	13.0%	20.4%	20.4%	15.4%	8.3%	3.0%	100%

3.10 Out of 3,120 retained fire-fighters, 126 were female, about 4% of the total.

3.11 The most common entry age for Retained Firefighters was 37. The entry age is significantly older than the average entry age for regular Firefighters. This reflects the fact that Retained Firefighters were not eligible to join the pension scheme until April 2006, regardless of the date they began serving as Firefighters.

Membership movements since 2003

3.12 Fire Authorities also provided data on the number of exits from the Schemes due to retirement, withdrawal and death as well as information on the amount of pension commuted at retirement by members retiring over the past four years.

3.13 The analysis of this data is discussed in the following sections. As female members account for only 2.7% of the total membership there was insufficient data available to provide a credible analysis of females separately. Female incidences of withdrawal, retirement etc have therefore been assumed to be the same as males, although it should be noted that females could have a different experience to males which could in future result in a different ongoing cost for their pension provision.

4 Valuation methodology

4.1 I have adopted the Entry Age method for this valuation. This is the same valuation approach that was adopted for the 2004 costing exercise. Under the Entry Age method a contribution rate, expressed as a percentage of total pensionable payroll (the standard contribution rate), is calculated and which if paid throughout the expected service of a typical new entrant, and if experience is in accord with the assumptions made, these contributions should be just sufficient to finance the benefits expected to be provided in due course to that entrant.

4.2 The accrued liability under the Entry Age method is the present value of the members' expected total benefits, less the present value of the Entry Age contributions due to be paid over the remaining working lifetime of the members.

4.3 We have calculated separate contribution rates for the FPS and NFPS, as well as a combined rate.

4.4 The Firefighters' Pension Schemes are unfunded and historically there are no assets or reserves (real or notional) held to meet future benefit payments. Therefore no surplus or deficit has been taken into the valuation.

Financial assumptions

4.5 The Firefighters' Pension Schemes can expect contribution income and benefit outgo to occur over a very long period in the future. The financial assumptions should therefore represent a long-term view of expected future conditions.

4.6 Increases in pension benefits are awarded under the Pensions (Increase) Acts and are therefore linked to increases in the Retail Prices Index. Benefits awarded at retirement are related to the level of members' salaries at that time, and contributions are defined as a percentage of salaries. The most important financial assumptions are therefore the real investment return (discount rate) in excess of the rate of increase in earnings and the real investment return in excess of the increase in prices. The assumed real investment returns are more important than the absolute level of the return on investments or the actual levels of inflation.

4.7 The financial assumptions adopted for the 2004 costing exercise were that, in the long term, investment yields would exceed general increases in earnings by 2% a year, and price increases by 3.5% a year. These assumptions, which are consistent with the approach used for the assessment of costs in other large public sector schemes, have been retained for this valuation.

Demographic assumptions

4.8 Assumptions must also be made about the demographic development of the Schemes. In determining these assumptions, it is appropriate to have regard to the Scheme's own experience. As the NFPS had only been in operation for a year at the time of the valuation date, there was limited or no experience data from which a credible analysis could be made. Therefore, the discussion in section 5 below largely relates to the experience data collected from the FPS.

5 Experience analysis and demographic assumptions

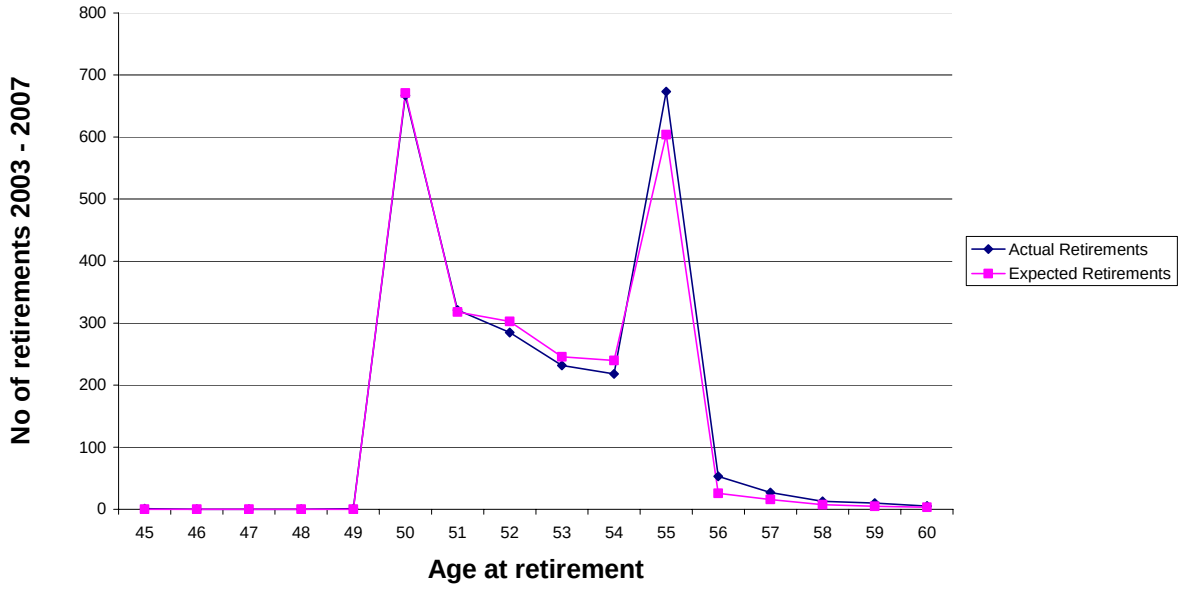
Age retirement

5.1 Age retirement occurs when a Firefighter leaves service and is entitled to an immediate pension, and the retirement is not due to ill health. In the FPS, the normal retirement age is 55. However, Firefighters can retire at any time after age 50 provided they have completed at least 25 years' service. A maximum pension is built up after 30 years of service.

5.2 In total there were 2,982 retirements during the period 31 March 2003 to 31 March 2007. All retirements occurred from the FPS (ie there were none from the NFPS). The average age at retirement was 51.8 years and the average amount of service was just over 28 years. The pattern of retirements was broadly in line with the 2004 costing assumptions, as can be seen in figure 3 below. I have therefore retained the 2004 assumptions for this valuation for the FPS.

Figure 3

Comparison of actual retirements between 2003 and 2007 with expected



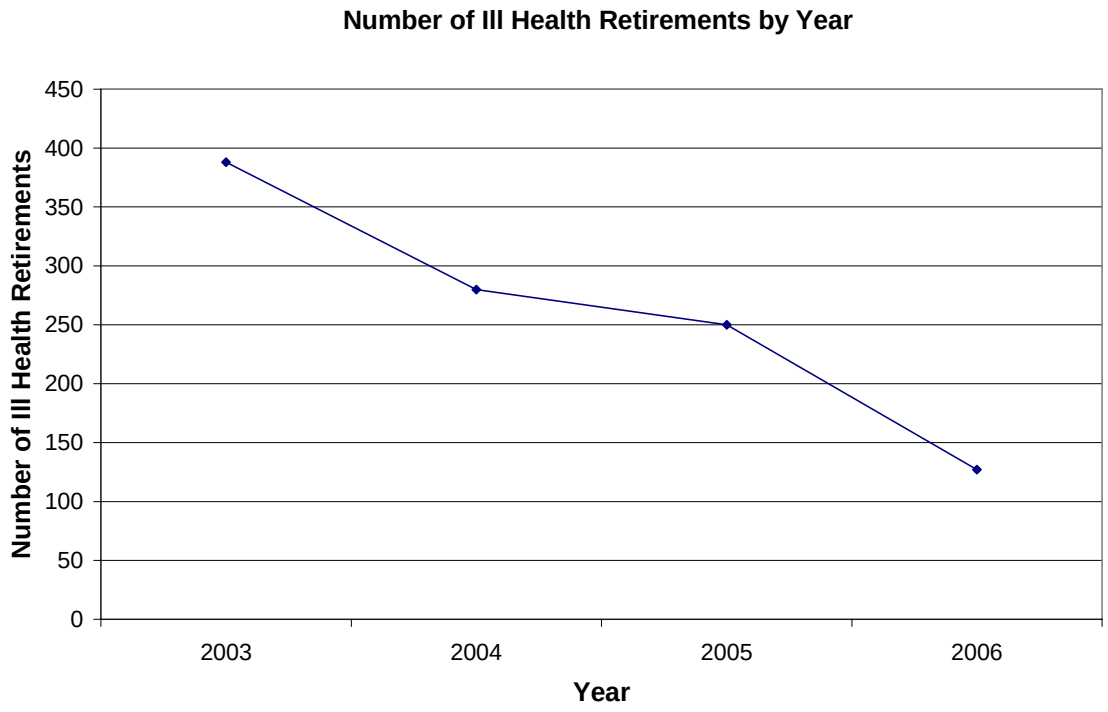
5.3 As mentioned above, no retirements took place from the NFPS during the intervaluation period, hence it was not possible to conduct an analysis of retirement patterns from the NFPS. The normal retirement age in the NFPS is 60. For this valuation I have adopted age 60 as the central retirement assumption for the NFPS. This is the same assumption as was adopted for the 2004 costing exercise.

Ill health retirement

5.4 A Firefighter receives an ill health retirement pension if they satisfy the eligibility criteria. There were 1,045 ill health retirements between 2003 and 2007, which represents 26% of the total of retirements which occurred during the period and is consistent with a figure of 8.7 ill health retirements per thousand employees reported by DCLG. This is a significant reduction in the proportion of retirements due to ill health compared with the period 2002/3, during which 42% retirements were due to ill health. This reduction might be explained by tighter controls in the process of determining whether a particular case meets the eligibility criteria. The incidence of ill health retirement varies by authority and an analysis by authority can be found in Annex C to this report.

5.5 Figure 4 shows the number of ill health retirements during each of the 4 years preceding the current valuation date. As can be seen, the downward trend in the number of ill health retirements has continued over the period for which data was made available.

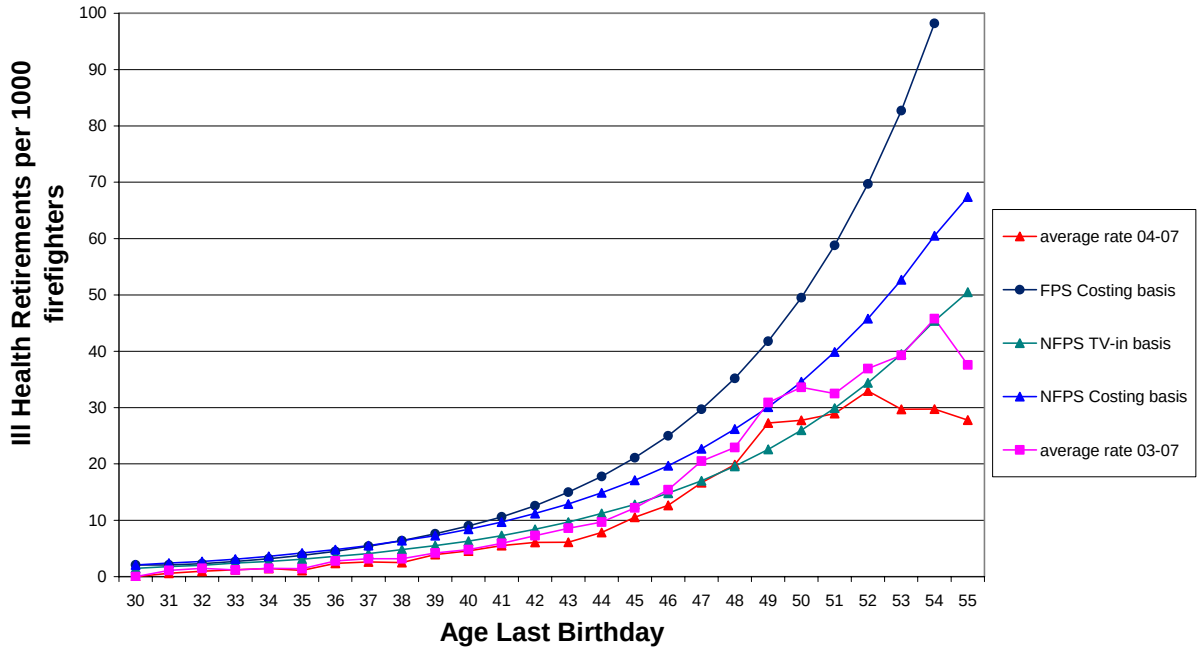
Figure 4



We have compared the actual number of ill health retirements with the expected numbers based on the 2004 costing assumptions and with the assumption adopted for the 2008 review of cash equivalent (CETV) transfer-in factors. The result is shown in the Figure 5 below.

Figure 5

Ill Health retirement rates



5.6 It is not known whether the downward trend of ill health retirements between 2003 and 2007 will continue, whether it has now reached a steady level or whether it is a trend which will reverse over subsequent years. DCLG have reported that ill health retirements were less than three per thousand employees during 2007/8, indicating a continuation of the observed trend. I have made some allowance for improving ill health retirement rates, but without going as far as the level observed in 2006/7. The 2008 CETV transfer-in assumptions (equivalent to nine ill health retirements per 1,000 Firefighters) are in my view a reasonable fit for the average experience, and this is the assumption I have adopted for this 2007 valuation.

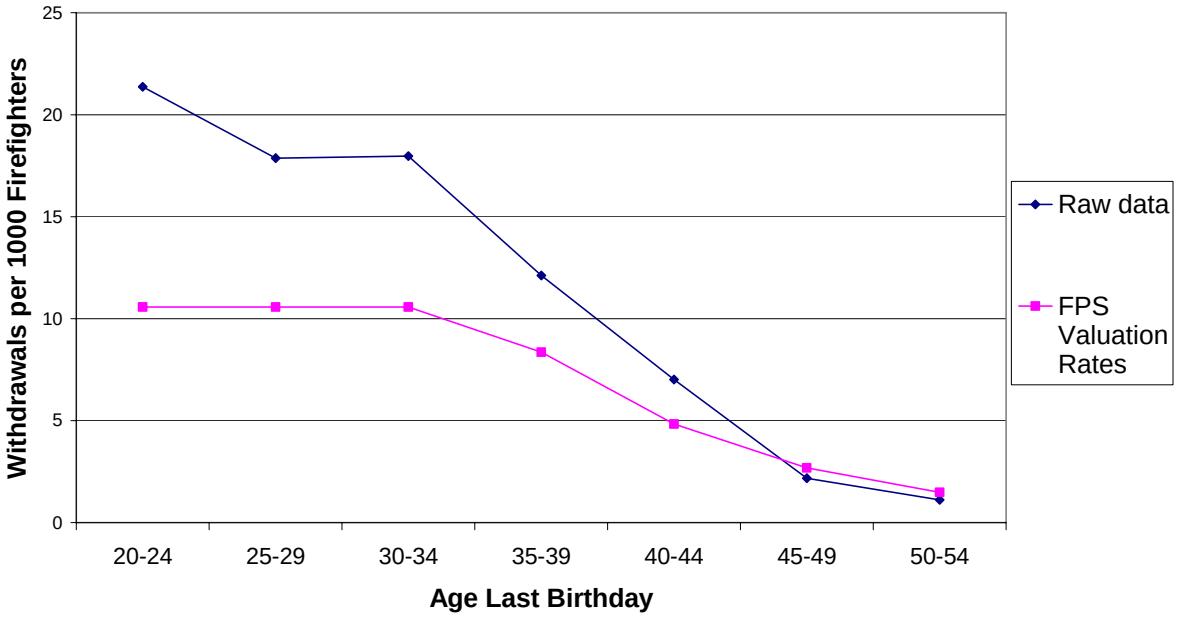
Voluntary withdrawals

5.7 Between 2003 and 2007 there were 1,180 voluntary withdrawals, representing an average turnover rate of around 1% per year. We have compared the actual withdrawals from 42 Fire Authorities during the period 2003 to 2007 with the expected number of withdrawals based on the 2004 FPS costings basis. The data provided on actual withdrawals does not differentiate by service. Newer members may be more likely to withdraw from service than longer-serving members, this distorts and complicates the analysis of actual and expected withdrawals. Although there is some evidence from the data to show that there has been a reduction in the numbers of voluntary withdrawals, it would seem appropriate to retain the assumptions used for the 2004 FPS costings particularly in light of the already low overall level of voluntary withdrawals. An analysis of voluntary withdrawals by authority can be found in Annex C to this report.

5.8 Figure 6 below shows the 2007 valuation withdrawal rates compared with the actual withdrawals during the period 2003 to 2007.

Figure 6

Withdrawal Rates



5.9 For the 2004 NFPS costings exercise, a range of possible withdrawal assumptions were considered, with the 2004 FPS costings basis acting as a lower bound to the level of withdrawals. This was because the assumptions used for the costings were based on an analysis of experience of the existing FPS, and it was not clear what changes would be seen in the new scheme with a normal retirement age of 60. As the NFPS has only been in operation for one year at the date of the assessment, sufficient NFPS withdrawal evidence has yet emerge and so I have retained the 2004 costing withdrawal assumptions for this assessment.

Pensioner longevity

5.10 Data on pensioner deaths was supplied by 39 Fire Authorities. During the period 2003 to 2007 there were 1,346 pensioner deaths. This includes both ill health pensioners and age retirement pensioners.

5.11 When analysing mortality rates, it is preferable to consider ill heath pensioners and age retirement pensioners separately. This is because ill health pensioners tend, on average, to experience heavier mortality than age pensioners and an assumption made for future mortality based on the average mortality of both groups can therefore become less relevant if the proportions of ill health to age pensioners changes significantly. Unfortunately, it was not possible to identify ill health and age deaths separately in the experience data provided and hence a combined analysis had to be undertaken. As at 31 March 2007, ill heath pensions made up approximately 56% of all pensions in payment.

5.12 In carrying out our analysis we compared the actual deaths during the period 2003 to 2007 with the number expected based on a standard mortality tables known as the "PNA00" series, released by the Continuous Mortality Investigation Bureau. These tables are based on data in respect of pension schemes insured with a life office, collected between 1998 and 2002, and are widely used by actuaries to cost the value of benefits provided through defined benefit pension schemes.

5.13 To allow for mortality improvements that have occurred since the construction of these standard mortality tables we have projected pensioner longevity forward to 2005 (ie the mid point in the 2003-2007 range), broadly in line with the improvements in national population longevity.

Adjustment to the standard mortality tables

5.14 Adjustments can be made to the standard tables to reflect scheme specific experience. Overall, our analysis showed that an adjustment of +1 year of age would provide a suitable match for the scheme experience - ie that pensioners would be assumed to be one year older than their actual age. I have adopted this age rating to value both age and ill health pensioner liabilities.

5.15 For active members, experience has shown that the number of ill heath retirements has declined significantly over recent years and an average age adjustment of +1 year may, given the current proportion of ill health retirements, not be appropriate for a combined group of age and ill health retirees. To help set a pensioner longevity assumption for current active members, I have therefore also had regard to the pensioner longevity assumptions adopted for the recent review of public sector transfer values as well as the 2004 costing exercise. Taking these into account I have adopted no age rating for future normal health retirements and, for consistency with the pensioner mortality experience, an age adjustment +3 years for future ill health retirements.

Future improvements in pensioner longevity

5.16 For active and deferred members, we have made an allowance for future longevity improvements, consistent with that incorporated in the (latest) 2006-based principal UK population projections by the Office for National Statistics (ONS). This represents a greater allowance for future improvement than was the case in the 2004 costings. Based on the above, and projecting longevity improvements to 2047 (broadly in line with the average expected future lifetime of a typical Firefighter) the life expectancy of a new entrant age 25 years would be 64.1 years (male) and 66.1 years (female) and for a Firefighter retiring in 2007 in normal health at age 55 would be 34.8 years (male) and 36.6 years (female).

5.17 For pensioners, I have also adopted longevity improvements in line with the ONS population projections, but with these improvements projected to each year the pensioner is expected to survive. Based on the above, the life expectancy of a Firefighter pensioner aged 62 at the valuation date would be 26.1 years (male) and 27.7 years (female).

Mortality in service

5.18 Data on deaths in service was available but was not significant enough to conduct a credible analysis. We have adopted an in-service mortality basis that is consistent with the pensioner mortality tables.

Promotion / merit salary scale

5.19 We have analysed the salary experience data for the regular members of the FPS and NFPS, calculating the average salary for each year of service and comparing the ratio of average salary at each year with average salary on joining the scheme.

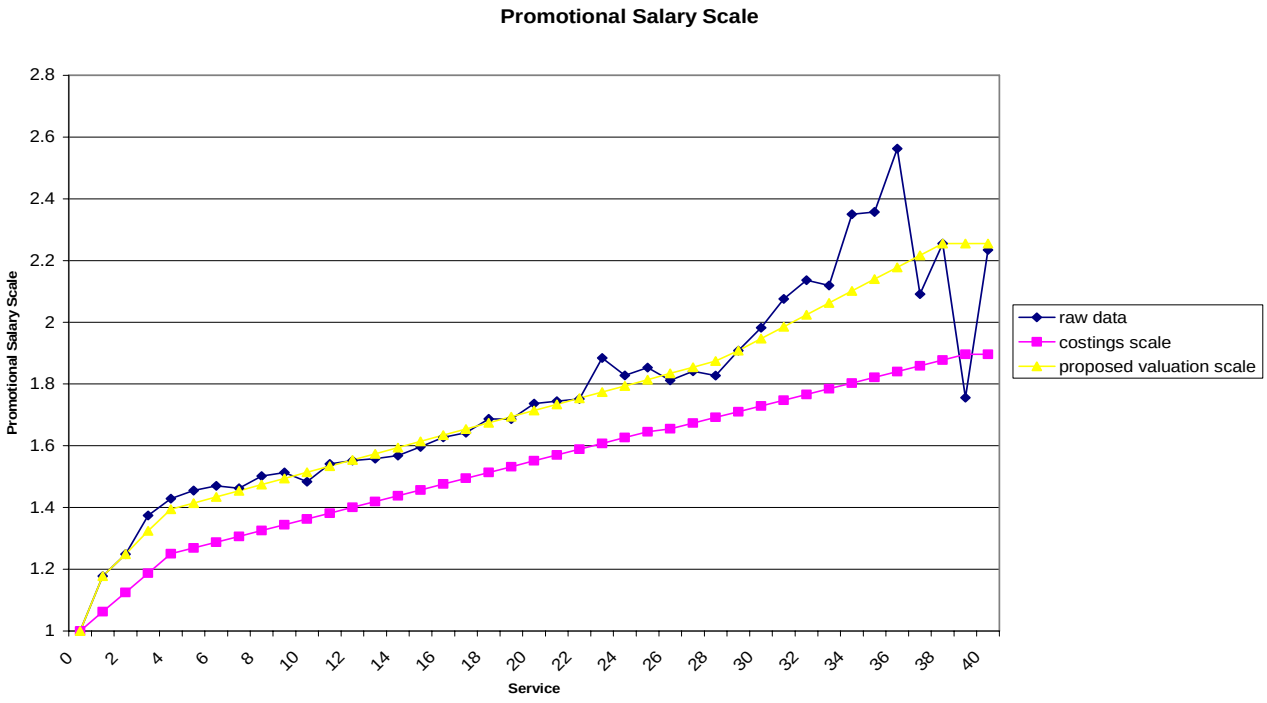
5.20 The data indicates that the merit salary scale (ie the scale of expected pay rises in excess of the assumption for general earnings inflation) of Firefighters increases as their service increases, broadly in line with the 2004 costing assumptions but at a steeper rate than expected when service is greater than 30 years. This is particularly noticeable at older ages, where the proportion of less senior Firefighters decreases, increasing the relative proportion of more senior grades amongst the membership and, in turn, increasing the average salary of the membership. However, the number of Firefighters who remain in the scheme after 30 years service falls off quite steeply (see figure 2 above) making the experience rather more volatile.

5.21 For the FPS, we have increased the salary scale to reflect the observed experience.

5.22 In the FPS, the proportion of senior grades increases with service due to senior grades being more likely than less senior Firefighters to stay in service after 30 years of service. In the NFPS, members will not be eligible for normal retirement until age 60 and this could lead to more less senior Firefighters staying in service after 30 years of service than seen in the FPS. A greater number of less senior Firefighters working on for longer than they do now would dampen down the average salary at older ages and lead to a flatter salary scale for the NFPS than the FPS. In consultation with DCLG, and in the absence of detailed data for the NFPS, I have therefore retained the merit salary scale used for the 2004 costings of the NFPS.

5.23 Figure 7 below compares the salary scale adopted for the 2004 costings (to be used in this valuation for the NFPS), the observed salary scale (raw data) and the proposed 2007 valuation salary scale for the FPS.

Figure 7



Commutation

5.24 In the Firefighters' Pension Schemes, members have the option to take a lump sum at retirement by commuting up to 25% of their pension. Commutation in the FPS takes place on broadly actuarial neutral terms and, in the NFPS, at a fixed rate of £12 cash for each £1 per year of pension commuted. 38 Fire Authorities provided data on the amount of pension commuted on retirement from the FPS during the period 1 April 2003 to 31 March 2007. Those members who opted to commute pension for cash generally opted to commute the maximum amount allowable ie 25% of their pension.

5.25 According to the data available, no retirements and therefore no commutation took place in the NFPS.

5.26 In the 2004 costing exercise it was assumed that 90% of the NFPS membership would commute the maximum of 25% and no commutation was assumed for the FPS, where commutation occurs on cost neutral terms. I have retained these assumptions for the 2007 valuation.

Entry age

5.27 In the 2004 costing exercise the average entry age was assumed to be 25 years. We have retained this average entry age at this valuation for both the FPS and NFPS.

5.28 The main assumptions adopted for this valuation are summarised in Annex D.

6 Results of the valuation

6.1 The results of this valuation have been considered in two parts. The first part is to consider the average pension cost for the whole career of typical new entrants. This average SCR is taken as the cost of benefits accruing for each year of future membership of the scheme. This "future service assessment" is discussed in paragraphs 6.2-6.7 below. The second part considers the present value of the members' expected total benefits, less the present value of the Entry age contributions due to be paid over the remaining working lifetime of the members. The results for this "past service assessment" are set out paragraphs 6.8-6.12 below.

Future service assessment.

6.2 The standard contribution rate (SCR) has been determined using the actuarial assumptions set out in sections 4 and 5 of this report. The SCR may be regarded as the average cost of benefits accruing if the assumptions made are borne out in practice.

6.3 The total SCR (ie employer plus member contributions) calculated using the Entry Age method is assessed for this valuation as 37.7% of pensionable pay for the FPS and 23.7% of pensionable pay for the NFPS. Combining these rates over the 4 years following the valuation date, and weighting by the expected payroll in each scheme over that period, would give a combined SCR of 36.5%. All other things being equal, this combined rate can be expected to fall at successive valuations as the number of Firefighters in the NFPS increases.

6.4 We understand that the cost of administering the Schemes is met separately by the Local Authorities, paid for out of operating costs. Based on our experience for similar sized schemes, an amount equal to 0.3% of payroll might be sufficient to cover the administration costs.

6.5 Members contribute to the Schemes at the rates of 11.0% of pensionable pay in the FPS and 8.5% of pensionable pay in the NFPS.

6.6 The standard contribution rate can be expected to remain stable, provided the experience is in line with the actuarial assumptions made and that the age and sex distribution of the new entrants remains relatively stable.

Impact of the changes to the 2004 costing assumptions

6.7 The SCR for the FPS, excluding an allowance for expenses, has increased slightly since the 2004 costing exercise from 37.5% to 37.7% at 31 March 2007. This small increase in the contribution rate has resulted from the strengthening of the longevity assumptions, offset by a reduction in the assumed ill health retirement rate, together with the introduction of lower and upper tier ill health pensions. The impact of these changes is given in the table below.

Change in assumption	Approximate change in SCR
Introduction of two tier ill health pensions	-1.3%
Reduction in ill health retirement rates	-0.4%
Steeper salary scale	+0.3%
Strengthened longevity assumptions	+1.1%
Other factors[1]	+0.5%

6.8 In 2004, the estimated cost of benefits accruing in the NFPS to a new entrant over the period of their working lifetime was estimated to be in the range of 21.2% to 24.2%, with an average figure of 22.7%. Adopting the same methodology at this assessment (and updating the ill health and mortality demographics), the equivalent range at 31 March 2007 would be 22.0% to 25.4% with an average SCR of 23.7%. The majority of the increase is due to using more cautious pensioner longevity assumptions, offset by a reduction in the expected number of ill health retirements as shown in the table below.

Change in assumption	Approximate change in SCR
Reduction in ill health retirement rates	-0.3%
Strengthened longevity assumptions	+0.9%
Other factors[1]	+0.4%

Ill Health Charge and Deduction

6.9 Fire Authorities are required to pay an ill health charge in respect of all ill health retirements. The charge is currently four times pensionable pay for upper tier ill health retirements and twice pensionable pay for lower tier ill-health retirements. In lieu of this charge, a deduction is made from the contributions payable by Fire Authorities. The deduction is currently 5.2% for FPS and 3.2% for the NFPS.

[1] Includes slight change in methodology, and interaction of demographic changes

6.10 We have recalculated the deduction from the contribution rate using the valuation assumptions and assuming that 25% of ill health retirements are upper tier and 75% are lower tier. The deduction from the contribution rates is as follows:

	FPS	NFPS
SCR (excluding an allowance for expenses)	37.7%	23.7%
Deduction from SCR due to ill health charge	2.3%	3.4%
Total Contribution Rate	**35.4%**	**20.3%**

The deduction from the Standard Contribution Rate for the FPS has fallen from 5.2% to 2.3%. This change is due to the introduction of two tier ill health retirements in the FPS. The deduction of 5.2% was calculated based on there being a single tier of ill heath retirements and all ill heath retirements being upper tier, whereas the deduction of 2.3% is based on two tier ill health retirements, assuming that only 25% of retirements are upper tier (and 75% lower tier).

Past service assessment.

6.11 The liabilities for past service have been determined using the methodology set out in section 4 and the actuarial assumptions described in sections 4 and 5 of this report. The results are set out below:

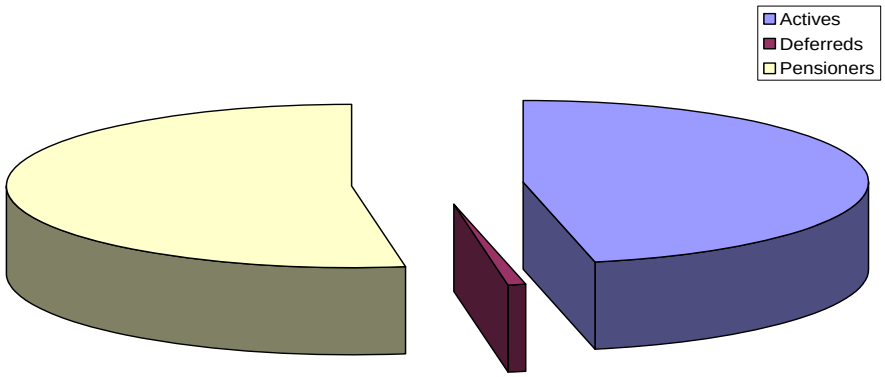
Actuarial Liability as at 31 March 2007

	Actuarial Liability	Value at 31 March **2007** (£ billion)
Current Members – service up to 31 March 2007:		
(a)	Members of FPS	6.4
(b)	Members of NFPS	0.0
Members with Deferred Benefits:		
(c)	Former Members of FPS	0.1
(d)	Former Members of NFPS	0.0
Pensions in Payment:		
(e)	Former Members	6.9
(f)	Dependants	0.3
Total liabilities for all accrued benefits = (1) to (6)		13.8[2]

[2] Numbers may not add due to rounding

6.12 A summary of the aggregate past service liability is given in Figure 8, showing the distribution of liabilities by class of member.

Figure 8 – Distribution of Liabilities (£million)



6.13 The size of the liabilities is sensitive to the assumptions made, particularly the assumptions for the real discount/interest rates and future longevity improvements. This is discussed further in section 7.

6.14 The actuarial liability of the Schemes was not calculated as part of the 2004 costing exercise, but we have nevertheless calculated the liability as at 31 March 2007 on both the 2007 valuation assumptions and the 2004 costing assumptions to determine what impact the changes we have made to the assumptions would have on the liability.

6.15 Our calculations show that the changes to the assumptions would have increased the liability for pensioners by just over 9% and the liability for the past service for active members by 6%. The main reason for these increases is attributable to a strengthening of the pensioner longevity assumptions. The increase in the active member liability is less than for pensioners because the longevity factor is partly offset by the reduction in the assumed incidence of ill health retirement.

7 Sensitivity analysis

7.1 The true cost of pensions emerging will differ from the figures quoted in section 6 if the underlying assumptions made are not borne out in practice. This section of the report highlights the sensitivity of the valuation results to some of the more important assumptions made.

7.2 The key financial assumptions are the rate of return net of price inflation and the rate of return net of salary inflation. Amongst the key demographic assumptions are pensioner longevity, the average age at entry, rates of commutation and rates of ill health retirement. The table below indicates the impact of changes to these assumptions on the scheme's liabilities and standard contribution rate:

Change in assumption	Approximate increase in the liabilities (%)	Approximate Increase to liabilities (£m)	Approximate Increase in SCR (% pensionable pay) FPS / NFPS
Decrease in the rate of return in excess of salaries of ½% per year	2.3% for actives	139	2.7% / 1.6%
Decrease in the rate of return in excess of prices of ½% per year	7.0% for all members	946	3.1% / 1.9%
Assumed longevity increased by rating the tables assumed down by one year	1.4% for all members	182	0.4% / 0.2%
Increase ill health retirements by 4 in 1,000	0.7% for actives	44	0.4% / 0.3%
Average amount of lump sum commuted reduces by 10%	0.2% for NFPS members	negligible	0.0% / 0.2%

7.3 If the change is in the opposite direction (ie if real interest rates are increased, or longevity decreased), the impact on the liabilities and contribution rates would be a reduction in value of the same approximate magnitude shown.

8 Conclusions

8.1 Based on the calculation method and assumptions outlined in this report, the ongoing cost of providing benefits to Firefighters' under the Firefighters' Pension Schemes, before the deduction of members' contributions, has been assessed to be 37.7% of pensionable payroll for FPS members and 23.7% of payroll for NFPS members.

8.2 Combining these rates over the 4 years following the valuation date, and weighting by the expected payroll in each scheme over that period, would give a combined SCR of 36.5%. All other things being equal, this combined rate can be expected to fall at successive valuations as the number of Firefighters in the NFPS increases.

8.3 We understand that the cost of administering the Schemes is met separately by the Local Authorities, paid for out of operating costs. An amount equal to 0.3% of payroll might be sufficient to cover the administration costs.

8.4 The reduction in the contribution rate payable to allow for the ill health deduction has been assessed to be 2.3% of pensionable payroll for the FPS and 3.4% of payroll for the NFPS. The ongoing cost of providing benefits after allowing for the ill health deduction (excluding any allowance for expenses) has been assessed to be 35.4% for the FPS and 20.3% for the NFPS. After allowing for members contributions of 11% of pay for the FPS and 8.5% of pay for the NFPS, the employers' contribution rate has been calculated to be 24.4% and 11.8% of pay respectively.

8.5 The total accrued liability for Firefighters' pensions as at 31 March 2007 has been assessed as £13.8bn.

Annex A

Summary of Membership Data

Regular Active Firefighters as at 31st March 2007

	Number			Average Age			Average Pensionable Pay (£pa)*			Average Reckonable Service**		
Scheme	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**
FPS	28,369	705	29,074	40.4	33.3	40.2	30,765	27,179	30,678	16.3	7.5	16.1
NFPS	1,230	109	1,339	30.1	30.3	30.1	22,560	22,292	22,539	1.2	0.8	1.1
Retained	2,994	126	3,120	38.9	34.9	38.7	25,945	24,508	25,887	0.4	0.2	0.4
Total	**32,593**	**940**	**33,533**	**39.9**	**33.2**	**39.8**	**30,013**	**26,254**	**29,907**	**14.3**	**5.7**	**14.1**

***** For Retained Members, the Average Pensionable Pay in the above table refers to the Reference Pay. If no Reference Pay has been provided for a Retained Member, we have assumed that their Reference Pay is the same as the average Reference Pay of members for whom data has been provided.

** The Average Service refers to the actual service of members and excludes doubling.

Deferred members as at 31st March 2007

Scheme	Number			Average Age			Average Pension (£pa)		
	Males	**Females**	**Total**	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**
FPS	1,800	245	2,045	44.6	43.8	44.5	5,550	4,976	5,481
NFPS	<5	0	<5	Not disclosed	-	Not disclosed	Not disclosed	-	Not disclosed
Total	**1,803**	**245**	**2048**	**44.6**	**43.8**	**44.5**	**5,541**	**4,976**	**5,473**

Pensioners as at 31st March 2007

		Number			Average Age			Average Pension		
Scheme	**Type of Retirement**	**Males**	**Females**	**Totals**	**Males**	**Females**	**Totals**	**Males**	**Females**	**Totals**
FPS	Age Retirement	12,585	69	12,654	63.3	73.9	63.4	14,938	4,513	14,881
FPS	Ill Health Retirement	16,319	51	16,370	59.8	44.0	59.8	11,438	5,849	11,421
Total		**28,904**	**120**	**29,024**	**61.4**	**61.2**	**61.4**	**12,962**	**5,081**	**12,930**

Dependants as at 31st March 2007

		Number			Average Age			Average Pension (£pa)		
Scheme		**Males**	**Females**	**Totals**	**Males**	**Females**	**Totals**	**Males**	**Females**	**Totals**
FPS	Widow(er)s	53	5,213	5,266	61.2	74.3	74.2	4,545	4,651	4,650
	Dependants	169	170	339	14.1	14.9	14.5	1,989	2,344	2,167
NFPS	Widow(er)s	0	<5	<5	-	Not disclosed	Not disclosed	-	Not disclosed	Not disclosed
	Dependants	<5	0	<5	Not disclosed	-	Not disclosed	Not disclosed	-	Not disclosed
Total		**223**	**5,385**	**5,608**	**25.3**	**72.4**	**70.6**	**2,621**	**4,579**	**4,501**

Annex B

Fire Authorities in England

Below is a summary of the Fire Authorities for which data was fully disaggregated by age and service. The four Fire Authorities at the end of the table had to be excluded from our analysis of age retirements, ill health retirements and withdrawals due to incomplete data.

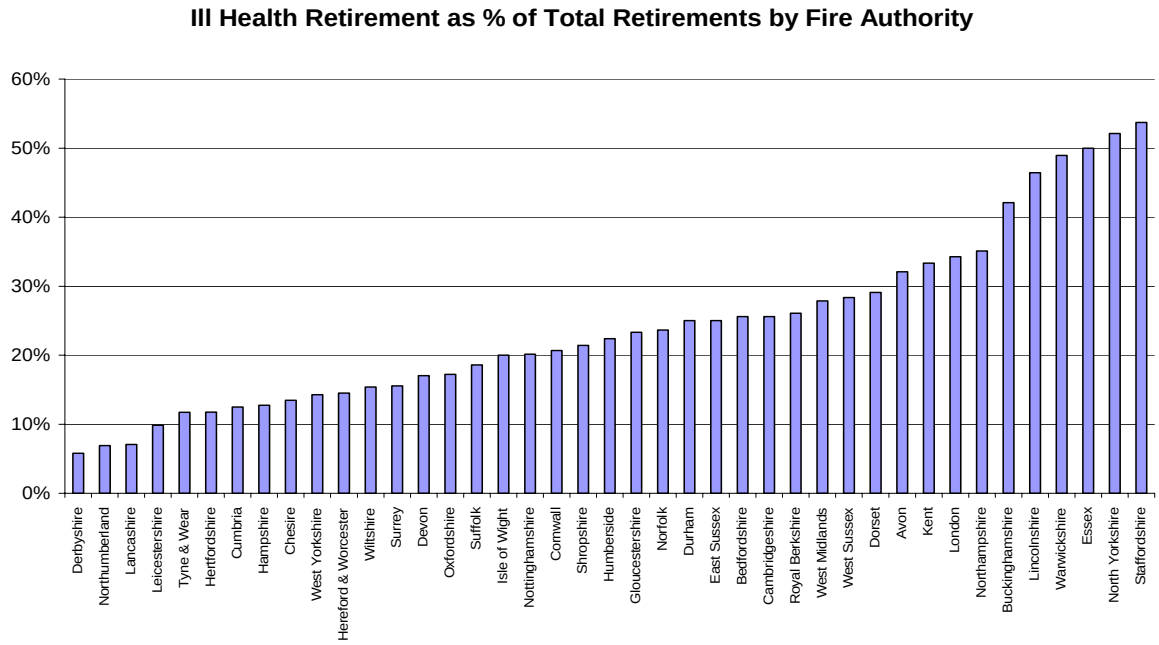
*Total Salary excludes any salary data provided for Retained Firefighters

Fire & Rescue Authority	Number excluding Retained	Retained	*Total Salary	Age Retirements	Ill Health Retirements	Withdrawals
Avon	672	68	£18,790,545	91	43	26
Bedfordshire	319	6	£9,621,223	32	11	10
Buckinghamshire	365	61	£10,168,697	22	16	41
Cambridgeshire	274	100	£8,550,465	32	11	8
Cheshire	524	0	£15,312,140	45	7	16
Cornwall	195	145	£6,397,222	23	6	9
Cumbria	269	81	£8,315,101	42	6	9
Derbyshire	450	75	£13,411,077	65	4	6
Devon	823	364	£25,355,922	107	22	16
Dorset	298	0	£8,987,055	39	16	20
Durham	383	72	£11,122,639	63	21	8
East Sussex	422	0	£12,866,186	30	10	22
Essex	937	71	£27,996,977	73	73	36
Gloucestershire	235	90	£7,124,029	23	7	13
Greater Manchester	1818	117	£53,945,476	0	0	9
Hampshire	788	179	£23,893,831	82	12	76
Hereford & Worcester	336	70	£9,610,865	53	9	17
Hertfordshire	562	35	£16,725,146	45	6	32
Humberside	706	144	£20,348,724	104	30	25
Isle of Wight	58	22	£1,749,808	16	4	0
Kent	930	213	£27,720,216	76	38	20
Lancashire	901	99	£26,882,782	92	7	18
Leicestershire	486	62	£14,339,038	64	7	19
Lincolnshire	232	186	£7,367,926	15	13	12
London	5853	0	£194,773,923	530	276	272
Norfolk	308	103	£9,392,435	42	13	9
North Yorkshire	347	151	£10,248,386	34	37	5
Northamptonshire	267	0	£8,263,610	37	20	12
Northumberland	195	46	£6,111,405	27	2	7
Nottinghamshire	556	0	£16,271,597	95	24	19
Oxfordshire	244	140	£7,522,783	24	5	38
Royal Berkshire	423	54	£12,118,237	17	6	48
Shropshire	208	56	£6,402,204	33	9	18
Staffordshire	448	119	£13,295,780	31	36	8
Suffolk	263	45	£7,979,661	35	8	14
Surrey	632	35	£19,277,205	87	16	55
Tyne & Wear	894	0	£27,286,021	128	17	0
Warwickshire	266	0	£7,879,960	24	23	7
West Midlands	1900	0	£53,107,418	282	109	109
West Sussex	361	59	£10,825,439	48	19	52
West Yorkshire	1520	44	£43,808,066	252	42	25
Wiltshire	259	0	£7,834,842	22	4	14
Cleveland	525	0	£15,590,641	*Data unusable*	*Data unusable*	*Data unusable*
Merseyside	1101	0	£32,336,871	*No data*	*No data*	*No data*
South Yorkshire	860	0	£25,228,057	*No data*	*No data*	*No data*
Isle of Scilly	0	8	*n/a*	*n/a*	*n/a*	*n/a*
Total	**30, 413**	**3120**	**£922,157,631**	**2982**	**1045**	**1180**

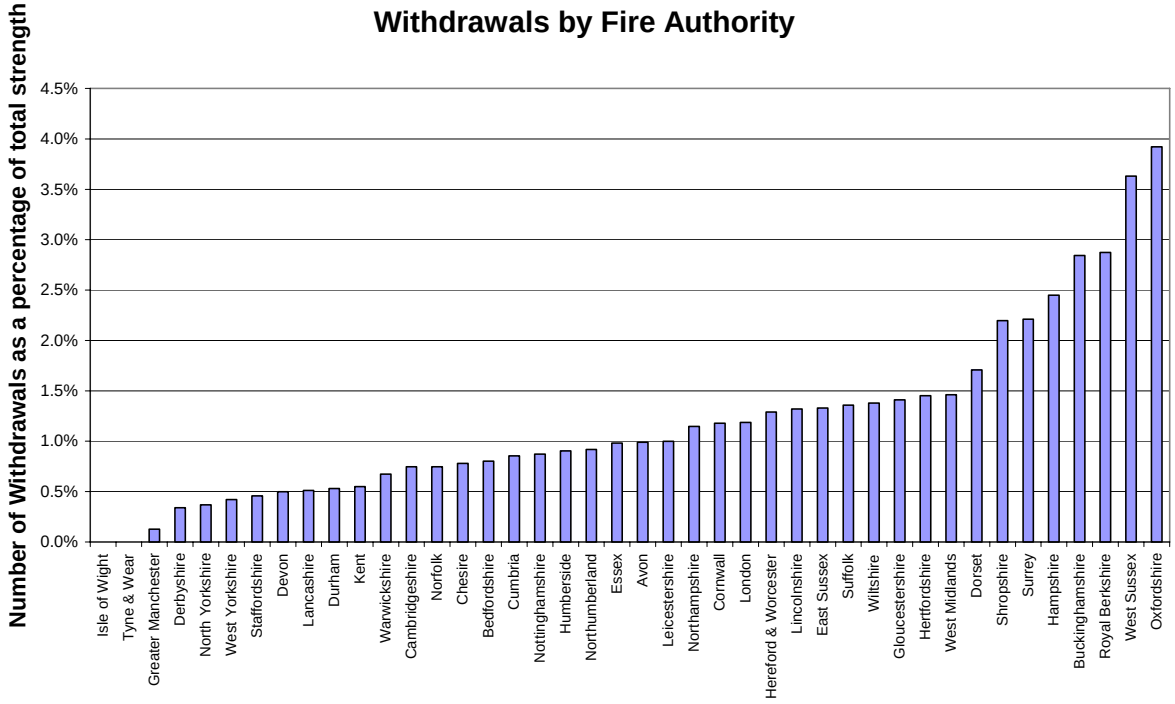
Annex C

Ill Health Retirements and Withdrawals

Below is a summary of ill health retirements as a percentage of total retirements split by Fire Authority.



Below is a summary of turnover as a percentage of total strength



Annex D

Actuarial Assumptions for the 2007 valuation

Financial assumptions

Discount rates	
Nominal	6.0% pa
Real (in excess of RPI)	3.5% pa
Real (in excess of general earnings growth)	2.0% pa

Demographic assumptions

Assumed number of exits per 1,000 members in the year following the age stated. All Members assumed to be male.

Exact Age	Death in Service	Ill-Health Retirement
30	0.2	1.5
35	0.3	3.1
40	0.4	6.3
45	0.7	12.8
50	1.1	26.0
55	1.7	50.5

Exact Age	Withdrawal (FPS) Lower Bound (NFPS)	Withdrawal Upper Bound (NFPS)
30	11	25
35	10	25
40	6	25
45	3	25
50	2	25
55	1	25

Assumed Rates of Promotional Pay Progression

The salary scale shows assumed pay progression in excess of general wage inflation in comparison to an index base of 1 at entry.

Exact Service	Promotional Pay in the NFPS	Promotional Pay in the FPS
5	1.27	1.41
10	1.36	1.51
15	1.46	1.61
20	1.55	1.71
25	1.65	1.81
30	1.73	1.95
35	1.82	2.14

Other demographic assumptions

Assumption	
Base mortality table	PNA00 ("Normal Amounts") tables issued by CMI
Future mortality improvement	Broadly in line with the national population experience between 2000 and 2006, and in line with the ONS 2006-based principal UK population projections after 2006
Age retirements	Members of the FPS are assumed to retire between 50 and 55. Members of the NFPS are assumed to retire at age 60.
Ill health tiers	25% on upper tier and 75% on lower tier
Proportions married, registered or partnered	Varies by age. At age 60, the assumed proportions married are 97% (male).
Age difference	Males are assumed to be 3 years older than spouse, civil partner or partner at all ages
Commutation	No commutation assumed for FPS. 90% of NFPS members opt to take the maximum amount permitted at 12:1

Annex E

Summary of benefits

		FPS (1992 SCHEME)	NFPS
1.	**Type of Scheme**	Final Salary	Final Salary
2.	**Relationship with S2P**	Contracted out	Contracted out
3.	**Employees Covered**	Members before 6th April 2006	New entrants on or after 6th April 2006 and Retained Members
4.	**Normal Retiring Age (NRA)**	55 (or from age 50 after completion of 25 years service)	60
5.	**Pensionable Pay (PP)**	Basic Salary plus other permanent emoluments	Basic Salary plus other permanent emoluments For Retained Members, Pensionable Pay is the Reference Pay (whole-time equivalent pensionable pay of a regular Firefighter employed in a similar role and with equivalent qualifying service.)
6.	**Final Pensionable Pay (FPP)**	Average PP in the last 12 months	Average PP in the last 12 months
7.	**Member's Contributions**	11.0%	8.5%

8.	**Normal Retirement**		(payable from 55 with reduction)
	Pension to Member	1/60th per year of actual service plus 1/60 per year of service in excess of 20 years, subject to a maximum of 30 years of actual service.	1/60th per year of actual service subject to a maximum of 45 years.
	Lump Sum	By commutation: Rates vary with age. Limit of 25% of full pension. No commutation is allowed is respect of the higher tier element of an ill health pension.	By commutation at £12:£1. Limit of 25% of full pension.
	Spouse's Pension	50% of member's pension before commutation	50% of member's pension after commutation
9.	**Pension Increases**	RPI (deferred to age 55 for age retirements)	RPI

10.	**Ill Health (IH) Retirement**	Two Tier – payable after two years' service Lower tier – capable of undertaking alternative employment • 2- 5 years service - 1/60th per year of service (subject to a minimum of 1 years pensionable service) • 5 or more years' service –unreduced accrued benefits Higher tier – incapable of undertaking other employment. • 2 to 5 years service – same as lower tier • 5 to 10 years service – service doubled • 10 to 13 years – service enhanced to 20 years • Over 13 years - service enhanced by an additional 7 years Enhanced pension is limited to 2/3rs of FPP before commutation.	Two tier Lower tier – capable of undertaking alternative employment • unreduced accrued benefits Higher tier – incapable of undertaking other employment • actual service plus • an enhancement of 2% for each year of past service multiplied by prospective service to 60 Enhanced pension is limited to 2/3rs of FPP before commutation.
11.	**Dependant's Pension on Death**	Payable after two years service Death in Service: 50% of Higher tier ill health pension Death after retirement: 50% of member's pre-commutation pension	Payable after 3 months service: Death in Service: 50% of Higher Tier ill health pension Death after retirement: 50% of member's post-commutation pension

12.	**Dependant's Short Term Pension**	Payable if member has less than two years service	
	Death in Service	The difference between the member's weekly pensionable pay and the weekly amount of any children's pension is payable for 13 weeks.	The difference between the member's weekly rate of pensionable pay when the member died and the spouse's weekly pension is payable for 13 weeks following the death
	Death after Retirement	The difference between the member's weekly pensionable pay and the weekly amount of any children's pension is payable for 13 weeks.	The difference between the member's weekly rate of pension when the member died and the spouse's weekly pension is payable for 13 weeks following the death
13.	**Lump Sum Death Benefits**		
	Death in Service	2 x Pensionable Pay	3 x Pensionable Pay
	Death after Retirement	If all payments made to the member and his/her dependants plus the actuarial value of the dependant's pension are less than the member's total contributions, then the balance of contributions is refunded.	5 times post commutation pension less amount already paid
14.	**Children's Pensions**	18.75% of member's pension (enhanced if the member dies in service to the higher tier ill health pension) up to a maximum of 37.5% shared between the eligible children Orphans – receive 25% of member's pension (enhanced on death in service to the higher tier ill health pension) up to maximum of 50% shared between the eligible children .	25% of member's pensions (enhanced if the member dies in service as for upper tier ill health) up to a maximum of 50% shared between the eligible children Orphans – 50% of the member's pension (enhanced on death in service to the higher tier ill health pension) shared between the eligible children

15.	**'Dependant' provision**	Spouses or Civil partners	Spouse, Civil partners, or nominated partners (financially dependant and residing together)
16.	**Cessation on remarriage or cohabitation**	Yes	No
17.	**Withdrawal Benefits on Leaving**	Refund of contributions if less than three months' service, otherwise;	Refund of contributions if less than three months' service, otherwise;
	Preserved Benefits	Deferred pension is payable from 60. Deferred pension is the lesser of: **1)** 40 / 60 x Pensionable Pay; **2)** A x B / C where: A is the member's actual pensionable service B is the member's notional service to age 55 subject to a maximum of 30 years service C is the member's notional pension at normal pension age based on average pensionable pay at the date of leaving	Deferred pension is payable from age 65. 1/60th per year of actual service subject to a maximum of 45 years.
	Pension Increases	RPI	RPI
	Spouses Pension	50% of member's deferred pension	50% of member's deferred pension
	Transfer Value	Yes	Yes

18.	**Refunds to Unmarried Members at Retirement.**	No	No