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SSAP 24 – EIGHTEEN MONTHS ON

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1. INTRODUCTION

1.1 During the 18 months since the publication of SSAP 24, we have been working on placing a sensible interpretation on the provisions of the statement and establishing a sound framework for implementing its actuarial aspects. This paper sets out the results of our deliberations and comments on what has happened so far. Most companies will adopt SSAP 24 for the first time for financial years ending 31st December 1989 or 31st March/5th April 1990. At this stage it is too early to state what the precise effect of the standard will be. This will depend on the assumptions and methods adopted. The paper however includes some comment on what at the time of writing, Summer 1989, looked likely.

1.2 We do not repeat the detail of the standard. We feel this has adequately been covered elsewhere and most actuaries will themselves have a copy of the standard. We do however comment on the actuarial methods and assumptions appropriate.

1.3 We develop a sound theoretical framework for the application of the standard, giving particular attention to interest adjustments and amortization of surplus/deficiency. The results of this work are encapsulated in a set of worksheets set out in Appendix 1.

1.4 In the course of our work we have come upon an interesting conclusion in relation to the transitional arrangements and method of spreading adopted. We present in chapter 5 a mathematical proof that irrespective of the transitional arrangement and method of spreading adopted, the total amount of company profits declared is the same. Only the timing of the emergence of that profit, whether in the past (as a balance sheet adjustment) or how it is spread over the future, is affected. At the time of writing we have not seen this result or comment elsewhere.

1.5 A brief chapter is included giving our views on the treatment of the 2% incentive payment payable under the Social Security Act 1986.

1.6 We compare SSAP 24 with FAS 87, the American standard, highlighting the differences and commenting on the extent to which it is possible to use the same pension cost figure to satisfy both standards.

1.7 Finally, we consider whether SSAP 24 achieves the objectives most people would assign to a standard on accounting for pension costs. In making our comments we have borne in mind the flexibility contained in SSAP 24 which some actuaries, accountants and other advisers consider worthwhile. We believe that if this flexibility is to be retained, but the standard is to achieve its aims, a few simple additions to the compulsory disclosures are necessary. We set out what we feel is appropriate.

2. COSTING METHODS

2.1 Introduction

2.1.1 Three factors are of major relevance to the costing methods and actuarial assumptions adopted under SSAP 24. The first is the requirement that the employer should recognise the expected cost of providing pensions on a systematic and rational basis over the period during which he derives benefit from the employees' services. Second is that the actuarial assumptions and methods, taken as a whole, should be compatible and should lead to the actuary's best estimate of the cost of providing the pension benefits promised. The third is that the regular pension cost should be a substantially level percentage of the current and expected future pensionable payroll in the light of the current actuarial assumptions.

2.1.2 We consider actuarial assumptions in the next chapter. In the remainder of this chapter we consider various actuarial funding methods and whether they meet the requirements of SSAP 24.

2.2 Aggregate method

2.2.1 The aggregate method does not provide the required split between regular cost and variation. Also there is no specific funding level under the method. Therefore for presentational reasons we consider the aggregate method inappropriate. If liabilities are split between past and future service, the aggregate method effectively becomes the attained age method.

2.3 Attained age method

2.3.1 Many actuaries would argue that the attained age method is suitable for funding a scheme where the membership is closed to new entrants. Let us consider whether it satisfies the requirements of SSAP 24 in those circumstances first.

2.3.2 As the scheme membership ages, the regular cost will rise from one valuation to the next. Therefore, the regular cost does not remain as a substantially level percentage of pensionable payroll and the method does not satisfy the requirements of SSAP 24 for a closed scheme (if the actuarial assumptions are best estimates).

2.3.3 As with the projected unit method (see below), the regular cost for the attained age method would remain a substantially level percentage of expected pensionable payroll if the scheme's profile with respect to age and earnings were stable. However, the target fund is the same as under the projected unit method but the attained age regular cost is higher than the projected unit regular cost. Therefore, at the next valuation, if the actuary's best estimate assumptions were correct, costing surplus would automatically be created by using the attained age method. So the method cannot be said to be deducting from profits the actuary's best estimate of pension costs in these circumstances.

2.3.4 Overall our conclusion is that, given the use of best estimate assumptions, the attained age method does not satisfy the requirements of SSAP 24.

2.4 Projected unit method

2.4.1 This method satisfies SSAP 24 if the expected age/earnings profile is reasonably stable so that the regular cost is expected to remain as a substantially level percentage of pensionable payroll. Use of a control period may add to stability in other cases.

2.5 Entry age method

2.5.1 Here the regular cost for a given set of actuarial assumptions is fixed by the members' ages at entry or by an overall average entry age. In the latter case, so long as this age remains stable, the requirements of SSAP 24 are satisfied. It is interesting to comment that traditionally for funding, some argue the entry age method should normally be applied to a scheme where a substantial supply of new entrants is expected. However, it is the only method which satisfies SSAP 24 for a scheme closed to new entrants; it is the only method which satisfies SSAP 24 in nearly all circumstances.

2.5.2 We understand that some argue that the entry age method is the only method that satisfies SSAP 24. The argument is that the entry age method automatically spreads the cost of benefits over the employee's working life if the actuarial assumptions are borne out. Note the singularity of "employee" here. Indeed, we agree it is the only method which does this if cost as a level percentage of payroll is required. However, paragraph 77 of the standard is less specific. SSAP 24 states "the period during which he derives benefit from the employees' services," the difference being the plural rather than the singular. In this context we argue that the projected unit method satisfies this less stringent requirement where the expected age/earnings profile is reasonably stable.

2.5.3 In most circumstances the entry age method has a high target fund compared with other methods. For certain age distributions this target fund could clash with the requirements of the Government Actuary's overfunding basis and method. It could therefore be unfortunate if the entry age method ever became the only method to satisfy a UK accounting standard on pension costs as this could lead to a long term liability on the balance sheet.

2.6 Current unit method

2.6.1 There has been some debate to the extent that this method satisfies the requirements of SSAP 24 and different views are held by different actuaries. Some argue the method fails in that it does not satisfy the requirements of paragraph 18 of the preamble to SSAP 24. The point at issue is whether the method makes full provision over the employees' service lives for the expected cost of their pensions, recognising the effect of expected future increases in earnings, including merit increases, up to the assumed retirement date or earlier date of withdrawal or death in service. As the cost of future earnings increases is included in part of the regular cost as they occur (for past service as well as current service benefits) we believe it can be argued that the method does so.

2.6.2 Others argue that in essence the method is a wind-up method and therefore this clashes with the basis that company accounts are drawn up on the assumption that the scheme continues. We would argue that the method is just a way of selecting a target fund and that one is not necessarily implying the scheme is to be wound-up by adopting this method.

2.6.3 However, we do believe the crux of the matter lies in whether in a specific instance, using best estimate assumptions, the current unit method produces a regular cost which is expected to remain a substantially level percentage of pensionable payroll. We would argue that normally a substantial amount of pre-retirement escalation has to be included in the assumptions for this to be so. If this is done, in most circumstances one is in practice adopting a method akin to the projected unit method, apart from the expensing of promotional earnings increases. It will also be necessary for the past service/age/earnings distribution to remain reasonably stable or for a control period to be used. In a particular case, several projections may be necessary to show that the method satisfies the standard but in general we would not rule it out.

3. ACTUARIAL ASSUMPTIONS

3.1 General comments

3.1.1 SSAP 24 states that in aggregate the assumptions and methods should produce the actuary's best estimate of cost. We would doubt whether such a judgment can be made without analysing each assumption or the differences between them separately.

3.1.2 Most actuaries would agree that there is range of acceptable assumptions to predict future experience. We would suggest that no economic model which derives data from the past can be assumed to produce confident estimates for the future. For example, future economic events are subject to some political influence. This certainly applies in the timescale of an average employee's future working lifetime. Such a timescale is appropriate for deciding SSAP 24 assumptions. We would therefore argue that it is unrealistic for SSAP 24 to suggest that the actuary can select a single set of assumptions which are his best estimate for a particular scheme.

3.1.3 Prudence overrides all accountancy standards. Therefore it has also been argued that prudence would override the requirement that the actuary's cost figure should be his best estimate. It is interesting here to make the comparison with the traditional actuarial view of funding. Traditionally, the Actuarial Tuition Service's pension fund courses and textbooks have suggested that the actuary should produce a reasonable estimate of costs but will tend towards prudence in his choice of assumptions. Some would argue that SSAP 24 when combined with the prudence principle of accounting requires similar judgment. Our view is that the standard is already very flexible on other matters. Any variations in cost due to slightly more prudent assumptions may only be of the same order as the differences in net costs due to other factors like the transitional arrangements and methods of spreading. What matters is that the disclosures fully describe what has been done. A professional expressing judgment on the accounts will then have the essential information to understand the basis and method adopted.

3.2 Financial assumptions

3.2.1 At the time of writing, a wide range of financial assumptions appears likely to be adopted for SSAP 24 costings. Real rates of return above earnings may vary from 1% to 3% p.a., maybe 3.5% p.a., and real rates of return above prices from 3% to 5.5% p.a. Where discounted income asset valuation techniques are used, the rate of dividend growth assumed, in examples seen so far, is from 1% p.a. below the implied rate of price increases to 1.5% p.a. above. It is appropriate for schemes with different investment risk strategies to adopt different investment return assumptions. The authors' own preference is for figures in the mid-range of those mentioned above, but as indicated in 3.1.2 we consider it inappropriate to be too dogmatic. We believe the future cannot be predicted with any great deal of confidence and is subject to political influence over a period as short as the average employee's future working lifetime. There must also be some doubt about the rate of economic growth the economy can sustain long term and therefore choice as to an individual actuary's best estimate assumptions.

3.3 Demographic assumptions

3.3.1 When it comes to the selection of decrements, we are concerned primarily with best estimates (possibly with some weighting towards prudence if the argument of 3.1.3 is accepted). Our main comment concerns the withdrawal decrement. For SSAP 24 purposes this decrement can be highly significant. It can substantially affect the period of the expected working lifetime and therefore the spread period for a surplus or deficit. This in turn has a substantial effect on the size of the variation from the regular cost and thus on the timing of the emergence of any surplus or deficit to the profit and loss account.

3.3.2 SSAP 24 is being adopted shortly after the introduction to this country of pensions legislation making occupational pension scheme membership voluntary. Some employers are experiencing a substantial reduction in the number of people joining their schemes. This in turn must have some effect on the rate of turnover of pension scheme membership. Scheme membership turnover rates may reduce if generally just those who intend staying with an employer long-term join. With benefits for early leavers being improved in recent years, in most cases the effect of withdrawal decrements on the capital value of liabilities is less significant than it was. However, as we have stressed before, the significance comes through in the expected period of remaining working lifetime or average remaining working lifetime. Many actuaries adopt fairly conservative withdrawal decrements for funding purposes. In practice, if adopted unaltered, such decrements might act to overstate expected working lifetimes. However our conclusion is that maybe there is slightly less of a case for increasing such decrements for SSAP 24 purposes than there might have been if the United Kingdom had not introduced voluntary scheme membership.

4. INTEREST CONSIDERATIONS

4.1 Introduction

4.1.1 In this chapter we develop:

- ★ the extent to which an adjustment is required to the pension cost to take into account interest on the balance sheet prepayment or provision; and
- ★ the interest adjustments to cash flow arising in the accounting year in order to produce a theoretically correct pension cost.

4.2 Interest on the balance sheet prepayment or provision

4.2.1 If the funding and costing methods and assumptions were the same, then providing the actuarial assumptions were borne out in practice, we would expect the balance sheet prepayment (or provision) to reduce to zero as soon as the initial surplus (or deficiency) had been fully amortized for both funding and costing purposes. However, the following example shows that this is not the case if the pension cost is just taken as the regular cost less the variation in regular cost, without adjustment for interest. (From now on we shall only refer to surplus and prepayment. Deficiency and provision will be taken to be negative surplus and negative prepayment, respectively. Hence a variation in regular cost will always be a *deduction* from regular cost).

4.2.2 Consider a non-salary-related non-contributory scheme where:

- ★ the initial surplus is £15,971;
- ★ *the regular cost is £4,000 per annum (calculated as at the year end)*;
- ★ the assumed future investment return is 8% per annum;
- ★ the funding strategy is to eliminate the surplus by a 5 year contribution holiday;
- ★ the surplus is to be amortized for costing purposes by level amounts of interest plus capital over the expected working lifetime of the membership which is 10 years;
- ★ the resultant variation to regular cost is £2,380 per annum (calculated as at year end).

Note that:

$$4000a_{\overline{5}|}^{8\%} = £15{,}971 \text{ ; and}$$

$$2380a_{\overline{10}|}^{8\%} = £15{,}971$$

4.2.3 Taking the pension cost to be simply the regular cost less the variation in regular cost, the balance sheet prepayment (provision) develops as follows:

Year	Funding contribution	Pension cost	Balance sheet prepayment (provision) at year end
	£	£	£
0	–	–	0
1	0	1,620	(1,620)
2	0	1,620	(3,240)
3	0	1,620	(4,860)
4	0	1,620	(6,480)
5	0	1,620	(8,100)
6	4,000	1,620	(5,720)
7	4,000	1,620	(3,340)
8	4,000	1,620	(960)
9	4,000	1,620	1,420
10	4,000	1,620	3,800
11	4,000	4,000	3,800

4.2.4 The prepayment does not therefore reduce to zero at the end of year 10, as we would expect. However, as has generally been appreciated by both the actuarial and accountancy professions, if the pension cost is adjusted by deducting interest on the prepayment at the beginning of the year then the prepayment (provision) does reduce to zero. This happens when the surplus has been fully amortized under both funding and costing.

4.2.5 The following shows how this works out for the above example.

Year	Funding contribution	Unadjusted pension cost	Adjusted pension cost	Balance sheet prepayment (provision) at year end
	£	£	£	£
0	–	–	–	0
1	0	1,620	1,620	(1,620)
2	0	1,620	1,750	(3,370)
3	0	1,620	1,890	(5,260)
4	0	1,620	2,041	(7,301)
5	0	1,620	2,204	(9,505)
6	4,000	1,620	2,380	(7,885)
7	4,000	1,620	2,251	(6,136)
8	4,000	1,620	2,111	(4,247)
9	4,000	1,620	1,960	(2,207)
10	4,000	1,620	1,797	0
11	4,000	4,000	4,000	0

[N.B. Unadjusted pension cost = Regular cost – Variation in regular cost;
Adjusted pension cost = Unadjusted pension cost – Interest on prepayment at beginning of year]

4.2.6 The above is, of course, only a simplified example. We therefore now prove that the deduction of interest on the prepayment will in all cases ensure that the prepayment reduces to zero as soon as the funding and costing amortizations have been completed.

4.2.7 First we require some notation.

For the year beginning at time t, let:

R_t = Regular (employer) cost
V_t = Variation from regular cost
E_t = Net pension cost
C_t = Company contributions paid
M_t = Members' contributions paid
B_t = Benefits paid

and assume that all the above items are brought forward with interest to the year end (time t+1).

Define the following at time t:

A_t = Value of assets under the costing assumptions
L_t = Target value of assets under the costing method and assumptions
PP_t = Prepayment in the balance sheet
U_t = Initial surplus unrecognised through the profit and loss account

Also, let:
i = Expected investment return assumption for costing purposes
n = Period of amortization of the initial surplus for costing purposes

4.2.8 The statement in 4.2.6 will follow immediately from the following more general result.

4.2.9 *If the costing actuarial assumptions are borne out in practice, and pension cost is defined as regular cost less variation in regular cost less interest on the beginning of year prepayment, then the balance sheet prepayment at each year end comprises the surplus (for costing purposes) at that date less the initial surplus yet to be amortized.*

i.e. if the costing assumptions are borne out and

$$E_t = R_t - V_t - iPP_t$$

then $PP_t = A_t - L_t - U_t \quad$ *for* $t = 0,1,2.....$

Proof:

(a) Suppose the initial surplus is not amortized but is recognised immediately in the balance sheet.

Then $U_t = 0$ for $t = 0,1,2.....$

and $PP_o = A_o - L_o$,

so the result is true for $t = 0$.

Suppose now that the result is true for t.

Then PP_{t+1}

$= PP_t + C_t - (R_t - V_t - iPP_t)$

$= (A_t - L_t)(1+i) + C_t - R_t$

$= [A_t(1+i) + C_t + M_t - B_t] - [L_t(1+i) + R_t + M_t - B_t]$

$= A_{t+1} - L_{t+1}$

Therefore, if the result is true for t, it is also true for t+1. It therefore follows from the principle of mathematical induction that the result is true for all values of t.

(b) Now suppose that the initial surplus *is* amortized.

Then $U_o = A_o - L_o$ and $PP_o = 0$.

The result is therefore true for $t = 0$.

Suppose the result is true for t.

Then PP_{t+1}

$$
\begin{aligned}
&= PP_t + C_t - (R_t - V_t - iPP_t) \\
&= (A_t - L_t - U_t)(1+i) + (C_t - R_t + V_t) \\
&= [A_t(1+i) + C_t + M_t - B_t] \\
&\quad - [L_t(1+i) + R_t + M_t - B_t] \\
&\quad - [U_t - (V_t - iU_t)] \\
&= A_{t+1} - L_{t+1} - U_{t+1}
\end{aligned}
$$

Therefore, if the result is true for t, it also true for t+1, so again by induction the result is true for all t.

QED

4.2.10. It now follows immediately that:

If the funding and costing actuarial assumptions and methods are the same, these assumptions are borne out in practice, and pension cost is adjusted by deducting interest on the beginning of year prepayment then the balance sheet prepayment reduces to zero as soon as the initial surplus has been fully amortized for funding purposes and fully amortized or recognised in the balance sheet for costing purposes.

i.e. if the funding strategy amortizes the surplus at time s, then

$PP_t = 0$ *for* $t \geqslant \max(s,n)$ *if initial surplus is amortized*

or   *for* $t \geqslant s$ *if initial surplus is recognised in the balance sheet.*

4.2.11 Using the adjusted pension cost, the recursion formula for the balance sheet prepayment is:

$$
\begin{aligned}
PP_{t+1} &= PP_t + C_t - (R_t - V_t - iPP_t) \\
&= PP_t(1+i) + C_t - (R_t - V_t)
\end{aligned}
$$

Therefore, to the extent that actuaries are familiar with the concept of adding interest to reserves, adjusting the pension cost by deducting interest on the beginning of year prepayment appears intuitively correct.

4.2.12 Furthermore, the formula from 4.2.9, i.e.

$$PP_t = A_t - L_t - U_t$$

also has an intuitive feeling about it for what we might have expected the balance sheet prepayment to be if the assumptions were borne out in practice. The following result (together with 4.2.9.) shows that this formula is, in fact, equivalent to adjusting the pension cost in the manner described.

4.2.13 *If the costing actuarial assumptions are borne out in practice and the balance sheet prepayment at each year end is equal to the surplus (for costing purposes) at that date less the initial surplus yet to amortized, then the pension cost is equal to the regular cost less the variation in regular cost less interest on the beginning of year prepayment.*

i.e., if the costing assumptions are borne out in practice and

$$PP_t = A_t - L_t - U_t \qquad \text{for } t = 0, 1, 2, \ldots\ldots.$$

then,

$$E_t = R_t - V_t - iPP_t \qquad \text{for } t = 0, 1, 2, \ldots\ldots.$$

Proof: Since $PP_t = A_t - L_t - U_t$

we have

$$\begin{aligned}
C_t - E_t &= PP_{t+1} - PP_t \\
&= (A_{t+1} - L_{t+1} - U_{t+1}) - (A_t - L_t - U_t) \\
&= (A_{t+1} - A_t) - (L_{t+1} - L_t) - (U_{t+1} - U_t) \\
&= [A_t(1+i) + C_t + M_t - B_t - A_t] \\
&\quad - [L_t(1+i) + R_t + M_t - B_t - L_t] \\
&\quad + [V_t - iU_t] \\
&= i(A_t - L_t - U_t) + (C_t - R_t + V_t) \\
&= C_t - (R_t - V_t - iPP_t)
\end{aligned}$$

Therefore $E_t = R_t - V_t - iPP_t$

The above holds also if the initial surplus is recognised immediately in the balance sheet, since in this case $V_t = U_t = 0$.

QED

4.2.14 It is tempting to wonder if we could go further than 4.2.13 and suggest that merely the requirement that the balance sheet prepayment reduces to zero when the initial surplus has been fully amortized under funding and costing is sufficient for the adjustment to the pension cost to be deduction of interest on the prepayment. However, it can easily be seen that this is not the case, since a negative adjustment of $(R_o - V_o - C_o - PP_o)$ in the first year and $(R_t - V_t - C_t)$ thereafter would set the prepayment to zero from the end of year one onwards, which is clearly nonsense.

4.2.15 The formulae:

$$E_t = R_t - V_t - iPP_t$$

and

$$PP_t = A_t - L_t - U_t$$

therefore give us a basis for the theoretical development of the provisions of SSAP 24. We continue this theoretical development in the next section.

4.2.16 However, before leaving this section we just remark that some accountants (and actuaries) have advocated that the rate of interest applied to the balance sheet prepayment/provision should be a current market short term rate rather than the rate assumed by the actuary for costing purposes. We would disagree with this view on the grounds of the above results.

4.3 Interest adjustments to cash flow

4.3.1 In 4.2 we intentionally simplified matters by assuming effectively that all items occurred or were calculated at the year end, so that we could concentrate on the principles involved. In practice, however, contributions etc. are not paid at the year end and because of this, interest on these items impacts on the theoretically correct calculation of pension cost.

We say "theoretically" correct because paragraph 40 of SSAP 24 suggests that such interest adjustments can be ignored on the grounds that they are unlikely to be material. However, we feel it would be useful in this section to develop a theoretically correct formula for pension cost in order that the question of materiality can be considered objectively in individual cases. Indeed, the additional calculations are by no means onerous and many actuaries may feel happier putting in an extra few minutes work to produce a result that is "correct" rather than "almost correct".

4.3.2. First of all we need to redefine some of the notation used in 4.2.7. We also introduce notation for administration expenses so that their correct treatment can be considered when such expenses are paid from the fund. (We trust that the reader will not find the redefinition of notation confusing; we felt this preferable to introducing a plethora of symbols. The main difference is the removal of the "t" indexation for a particular year.)

For a given year, let

R	= Regular cost calculated at the *beginning* of the year *before* the deduction of members' contributions
V	= Variation in regular cost calculated at the *beginning* of the year
E	= Net pension cost
C	= Company contributions paid
M	= Members' contributions paid
B	= Benefits paid
X	= Administration expenses paid out of the fund
PP_o, PP_1	= Balance sheet prepayment at beginning and end of year, respectively
A_o, A_1	= Value of assets under the costing assumptions at beginning and end of year, respectively
L_o, L_1	= Target value of assets under the costing method and assumptions at beginning and end of year, respectively
U_o, U_1	= Surplus unrecognised through the profit and loss account at the beginning and end of year, respectively

4.3.3. *The theoretically correct calculation of net pension cost is given by:*

$$E = R(1+i) - M\left(1+\frac{i}{2}\right) - \frac{i}{2}C + X\left(1+\frac{i}{2}\right) - V(1+i) - iPP_o$$

(assuming cash flows occur, on average, mid-year).

Proof: We can express

$$E = R - M + X - V + I - iPP_o$$

where I is the interest adjustment required (if any)

We have

$$PP_1 - PP_o = C - E$$

Therefore from 4.2.9,

$$[A_1 - L_1 - U_1] - [A_o - L_o - U_o](1+i) = C - R + M - X + V - I$$

Now

$$A_1 - A_o(1+i) = C\left(1+\frac{i}{2}\right) + M\left(1+\frac{i}{2}\right) - B\left(1+\frac{i}{2}\right) - X\left(1+\frac{i}{2}\right)$$

$$L_1 - L_o(1+i) = R(1+i) - B\left(1+\frac{i}{2}\right)$$

$$U_1 - U_o(1+i) = -V(1+i)$$

Therefore

$$I = -\frac{i}{2}C - \frac{i}{2}M + \frac{i}{2}X + iR - iV$$

and

$$E = R(1+i) - M\left(1+\frac{i}{2}\right) - \frac{i}{2}C + X\left(1+\frac{i}{2}\right) - V(1+i) - iPP_o$$

By using 4.2.9, the proof effectively assumes that the costing assumptions are borne out in practice. However, the proof holds for the more general case by using 5.4.6 in place of 4.2.9. QED

4.3.4 Of course, if cash flows do not take place, on average, mid-year, then the formula should be adjusted in the obvious manner.

4.3.5 The above formula is incorporated in the worksheets set out in Appendix 1.

5. TREATMENT OF SURPLUS

5.1 Introduction

5.1.1 This chapter covers the following material:

- ★ the establishment of a relationship between the sum of pension costs where the initial surplus is amortized and where it is recognised immediately in the balance sheet;
- ★ the different methods under which surplus can be amortized;
- ★ the treatment of surplus arising subsequent to the initial surplus.

5.2. A relationship between pension costs under amortization and immediate recognition

5.2.1 The purpose of this section is to prove the following result and its interesting corollary, 5.2.3. (For simplicity, we shall revert to the notation of 4.2.7 and assume all revenue items are brought forward to the year end with interest.)

5.2.2. *If the costing actuarial assumptions are borne out in practice, then*

(i) *the sum over the amortization period of the net pension costs if the initial surplus is amortized; plus*

(ii) *the initial surplus; equals*

(iii) *the sum over the amortization period of the net pension costs if the initial surplus is not amortized.*

i.e.

$$\sum_{t=o}^{n-1} (R_t - V_t - iPP_t) + (A_o - L_o) = \sum_{t=0}^{n-1} (R_t - iPP'_t)$$

(where PP_t, PP'_t denote the prepayments under amortization and immediate recognition, respectively).

Proof: From 4.2.9,

$$\sum_{t=o}^{n-1} (R_t - V_t - iPP_t) + (A_o - L_o)$$

$$= \sum_{o}^{n-1} R_t - \sum_{o}^{n-1} V_t - i\sum_{o}^{n-1}(A_t - L_t) + \sum_{o}^{n-1} iU_t + (A_o - L_o)$$

$$= \sum_{o}^{n-1} R_t - i\sum_{o}^{n-1}(A_t - L_t)$$

since

$$\sum_{o}^{n-1} V_t = (A_o - L_o) + \sum_{o}^{n-1} iU_t$$

(i.e. total repayments = capital repayment + annual interest on outstanding capital)

Also, from 4.2.9,

$$\sum_{o}^{n-1} (R_t - iPP'_t) = \sum_{o}^{n-1} R_t - i\sum_{o}^{n-1} (A_t - L_t)$$

Therefore,

$$\sum_{o}^{n-1} (R_t - V_t - iPP_t) + (A_o - L_o) = \sum_{o}^{n-1} (R_t - iPP'_t)$$

QED

5.2.3 It follows immediately from this result that:

If the costing actuarial assumptions are borne out in practice and the initial surplus is amortized, then the sum over the amortization period of the net pension costs is the same irrespective of the method of amortization adopted.

5.3 Methods of surplus amortization

5.3.1 Paragraph 80 of SSAP 24 states that surplus should be amortized over the expected remaining working lifetime of the active membership, or alternatively over the expected average remaining working lifetime of the active membership. No guidance is given, however, regarding the method of amortization that should be used, and experience to date indicates that auditors are prepared to accept any reasonable method.

5.3.2 The results in 5.2.2 and 5.2.3 imply that the long term effect on a company's profits is the same irrespective of the method of amortization used, and indeed whether it is amortized or not. It follows that:

a) if it is considered to be "true and fair" to place the initial surplus into past profits (i.e. on the balance sheet); and

b) if it is considered to be "true and fair" to adopt a method which spreads the initial surplus furthest into the future (i.e. the percentage of salaries method – see below – which is perhaps the most intuitive method for actuaries);

then it must be "true and fair" to adopt any method in between. We do question, however, the validity of the percentage of salaries method in 5.3.14 to 5.3.16.

5.3.3 We shall concentrate first on amortization over the expected *average* remaining working lifetime as this appears to be almost universally adopted in practice. We comment on the use of the full expected working lifetime in paragraphs 5.3.17 to 5.3.19.

5.3.4 Three principle methods of amortization have arisen in practice, these being:

★ as a constant percentage of salaries;

★ as level amounts of interest plus capital (the "mortgage" method);

★ as level amounts of capital with interest on the reducing balance (the "straight line" method).

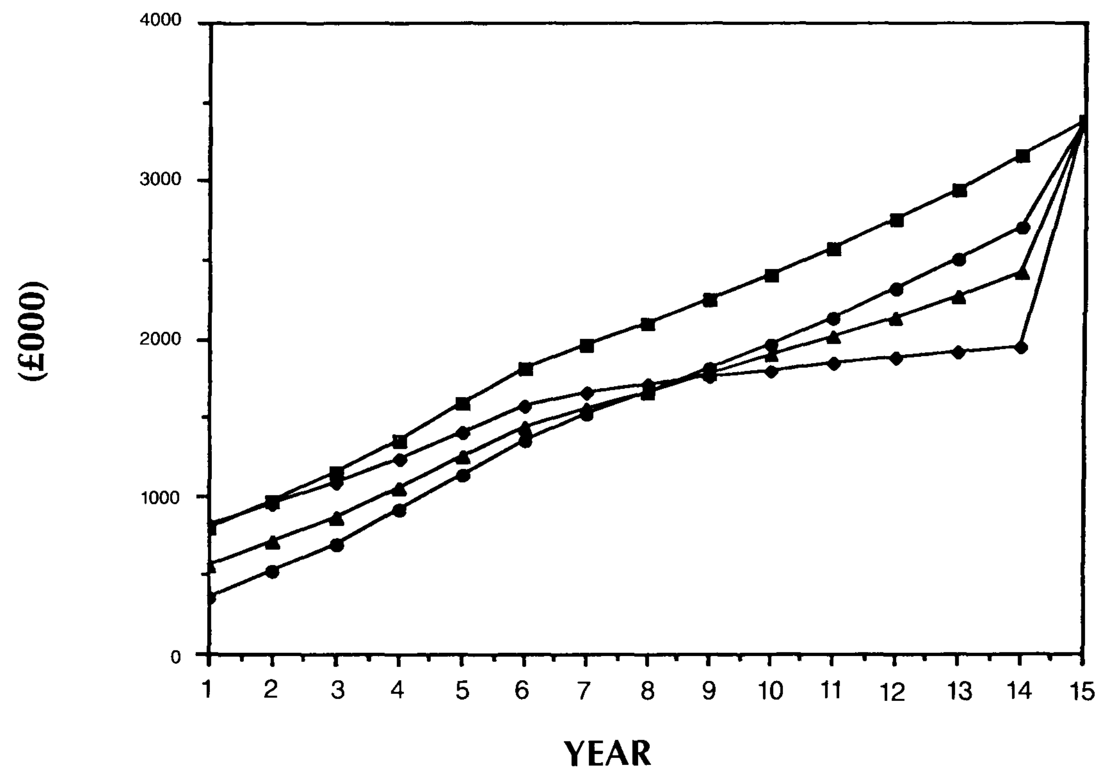
5.3.5 In 4.3.3, we showed that the variation in regular cost element of pension cost effectively needs to be calculated at the end of the accounting year. It follows that this variation element, V_t, for the year commencing at time t in respect of an initial surplus, S, is given by:

Method	$\mathbf{V_t}$
Percentage of salaries	$S[(1+s)^{t+1}/a^{k}_{\overline{n}|}]$ where s is the assumed rate of increase in salaries and $1 + k = \dfrac{1+i}{1+s}$
Mortgage	$S/a^{i}_{\overline{n}|}$
Straight line	$[S/n] + [iS(n-t)/n]$ (i.e. equal amounts of capital plus interest on the reducing balance)

(In each case, n is the expected average remaining working lifetime of the active membership at the date of first compliance with SSAP 24 and i is the assumed investment return.)

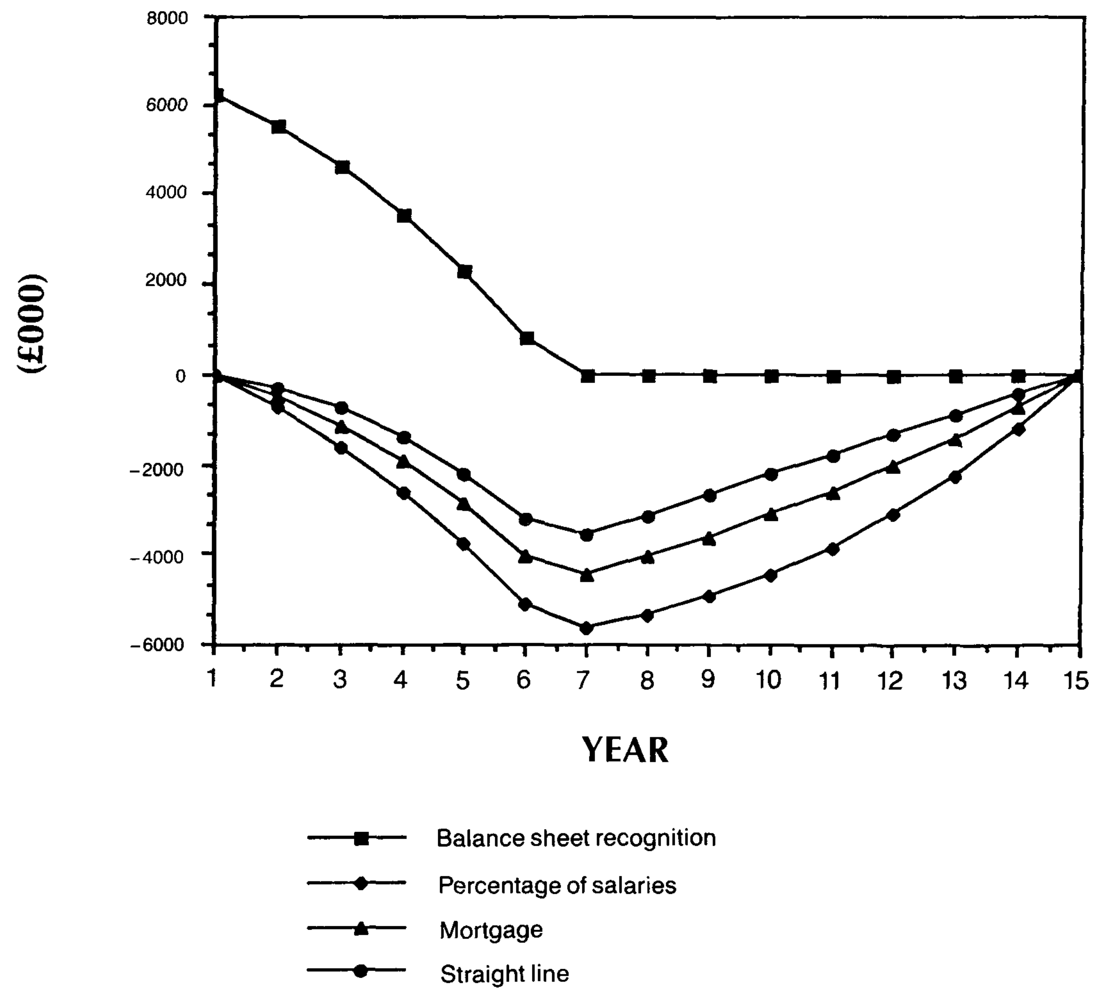
5.3.6 For a scheme which is in surplus, the percentage of salaries method will produce the highest initial pension cost whereas the straight line method will produce the lowest initial pension cost, the converse being the case for a scheme in deficiency. Naturally there are cross-over points in later years which can be seen on the graph at the top of the next page. The graph is based on projections of an actual case for which the essential data was as follows:

PENSION COST



BALANCE SHEET PREPAYMENT/(PROVISION)

(at beginning of year)



Costing:

Method	projected unit
Assumed investment return	9% per annum
Assumed salary increases	7% per annum
Value of assets	£42,951,000
Value of projected salaries past service liabilities	£36,706,000
Surplus	£6,245,000
First year regular cost (excluding members' contributions but including an expense allowance)	£1,363,000
Expected average working lifetime	14 years

Funding:

As costing but surplus is amortized by a company contribution holiday over 5.5 years.

5.3.7 The graph shows the emergence of pension costs if the surplus is recognised immediately in the balance sheet as well as if it is amortized under the three methods. We are sure that the reader will agree that the differences in the emerging pension costs under these four methods are quite staggering.

5.3.8 The lower graph shows the corresponding emergence of the balance sheet prepayment under the four cases, and again the differences are very wide.

5.3.9 Given these differences, both on the impact on the profit and loss account and the balance sheet, we would suggest that the credibility of SSAP 24 as a "standard" must be called into question. However, until such time as greater standardisation is made in this area (if ever), actuaries will quite rightly advise their client companies of the options available and companies are likely to elect for the option which is to their greatest advantage.

5.3.10 For a company whose scheme is in surplus at the date of SSAP 24 compliance, here are some examples of the options which might be elected depending on the different possible financial characteristics of the company:

- ★ if the company is relatively short term profit orientated, then the straight line amortization method may well be the most attractive;
- ★ if the company is profit (rather than asset) orientated but takes a rather longer term view and is concerned with stability of pension cost from year to year, then the percentage of salaries method of amortization is likely to appeal;
- ★ if the company is asset rather than profit biased, then recognising the initial surplus immediately on the balance sheet may be to its best advantage;
- ★ if the company is US owned, so that it only needs to comply with SSAP 24 for its local UK statutory accounts (the consolidated US accounts requiring pension cost to be calculated under FAS 87), then it may choose to recognise the surplus on the balance sheet immediately in order to increase its UK borrowing powers.

5.3.11 If the scheme were in deficiency, then in some cases the most advantageous option to the company could be quite different.

5.3.12 We should mention that the above are only generalisations and the individual figurework needs to be considered in the circumstances of each particular case.

5.3.13 Whichever method of amortization is adopted at inception, we anticipate that auditors will insist that the same method is adopted consistently in future years, save for exceptional circumstances justifying a change (although we cannot anticipate what such circumstances might be). The same applies in relation to the selection of costing methods and actuarial assumptions, although the actuary is supposed to adopt his "best estimates" for these items (to the extent that this is possible). There are therefore important decisions to be made in the first year of compliance with SSAP 24 which will not only affect the first year's accounts but future years as well.

5.3.14 Before leaving the different amortization methods, we comment on the validity of the percentage of salaries method in certain circumstances. Recognising the initial surplus immediately in the balance sheet does not necessarily produce a higher first year pension cost than adopting the percentage of salaries method of amortization.

5.3.15 This arises because the interest on the initial surplus (which is deducted from the regular cost under immediate surplus recognition) is greater than the percentage of salaries first year variation in regular cost. In other words, under the percentage of salaries method of amortization, the first year variation in regular cost does not necessarily cover the interest on the surplus being amortized. In such circumstances, we believe that this must call into question the validity of this method of amortization in accounting for pension costs.

5.3.16 The extent to which the situation occurs depends on the actuarial assumptions adopted and the length of the amortization period. From 5.3.5, the first year variation will not cover interest on the initial surplus if:

$$i > \frac{(1+s)}{a^{k}_{\overline{n|}}}$$

i.e. $$\text{if } n > \frac{\log i - \log s}{\log(1+i) - \log(1+s)}$$

For example, if i =9% and s = 7%, then the interest on the surplus will not be covered if the expected average working lifetime is greater than 13.6 years.

5.3.17 As mentioned in 5.3.3, the use of expected average working lifetime appears almost universal. However, the use of full working lifetime could appeal to a company faced with amortizing a significant deficiency.

5.3.18 Merely to apply the formulae in 5.3.5 with "n" replaced by the future working lifetime of the youngest scheme member would be unreasonable as this would allocate too much deficiency/surplus to later years when the number of survivors of the existing membership will be relatively few. Presumably auditors would reject such an approach.

5.3.19 It is therefore necessary to weight the amortization payments in some way. The most obvious method is to weight the payments by the expected numbers of surviving members in the relevant years. Under the percentage of salaries amortization method, recognition of salary weightings by age could also be incorporated.

5.4 Surplus arising subsequent to the initial surplus

5.4.1 The standard is not explicit on how surplus (deficiency) arising subsequent to the initial surplus should be treated except to the extent that it should be amortized over the full or average expected remaining working lifetime of the active membership. No mention is made as to whether:

★ surplus arising in the latest year (or valuation period) should be aggregated with all (unamortized) surpluses arising in previous years and then the total spread over the full or average expected remaining working lifetime of the current active membership ("re-spreading"); or

★ surplus arising in each year should be amortized separately over the full or average expected remaining working lifetime of the active membership current at that time ("separate spreading").

5.4.2 Re-spreading has the merit of simplicity but on theoretical grounds it has serious shortcomings. That is to say, if surplus is re-spread each year, there will never come a time when it is fully amortized. We would suggest that it could be argued that this contravenes the accounting objective of SSAP 24 that the employer should recognise the expected cost of providing pensions over the period during which he derives benefit from the employees' services. We understand from the accountancy profession, however, that in their view re-spreading is acceptable.

5.4.3 We develop in 5.4.6 below a simple way of identifying the aggregate unamortized surplus which will be particularly useful where re-spreading is to be adopted. First, however, we require some notation which we shall use in conjunction with the notation of 4.2.7. For the year commencing at time t, let

S_t = Surplus (deficiency) arising in the year calculated at year end

W_t = Element of the variation in regular cost for the year which amortizes surplus (deficiency) arising in previous years (excluding the initial surplus) calculated at the year end

US_t = Unrecognised (or unamortized) surplus (deficiency) at time t arising subsequent to the initial surplus

EA_{t+1} = Expected value of assets at time t + 1 based on the actual value of assets at time t, the costing assumptions, the expected benefit payments in the year and the actual contributions in the year

EL_{t+1} = Expected value of L_t at time t+1 based on the actual value of L_t at time t, the costing assumptions and the expected benefit payments in the year

N.B: We shall consider surplus (deficiency) to include the effects of benefit amendments (apart from immediately expensed pension increases – see below) and changes in actuarial assumptions. As before we shall just refer to surplus with deficiency considered to be negative surplus. We shall refer to surplus arising subsequent to the initial surplus as "subsequent surplus".

5.4.4 Now is a convenient place to introduce the SSAP 24 requirement that the capital cost of pension increases is to be expensed in the year in which they are granted unless an explicit advance provision has been made in the costing assumptions. For the year beginning at time t, let:

PI_t = Capital cost of pension increases granted in the year (and which are required to be expensed in that year) brought forward with interest to the year end.

5.4.5 We now have:

$$E_t = R_t - V_t - W_t + PI_t - iPP_t$$

$$S_t = (A_{t+1} - EA_{t+1}) - (L_{t+1} - PI_t - EL_{t+1})$$

and $$US_{t+1} = US_t - (W_t - iUS_t) + S_t$$

5.4.6 *The unrecognised subsequent surplus at a year end equals the surplus (for costing purposes) at that date, less the unrecognised initial surplus at that date, and less the balance sheet prepayment at that date, i.e.:*

$$US_t = A_t - L_t - U_t - PP_t \text{ for } t = 0,1,...$$

Proof: The result is clearly true for t = 0.
Suppose the result is true for t, then

$$\begin{aligned}
US_{t+1} &= US_t - (W_t - iUS_t) + S_t \\
&= US_t(1+i) - W_t + S_t \\
&= (A_t - L_t - U_t - PP_t)(1+i) - W_t \\
&\quad + (A_{t+1} - EA_{t+1}) - (L_{t+1} - PI_t - EL_{t+1}) \\
&\qquad \text{(by substitution from 5.4.5)} \\
&= (A_t - L_t)(1+i) - (U_t + PP_t)(1+i) - W_t \\
&\quad + (A_{t+1} - L_{t+1}) - [A_t(1+i) + C_t + M_t - B_t] \\
&\quad + [L_t(1+i) + R_t + M_t - B_t] + PI_t \\
&= (A_{t+1} - L_{t+1}) - (U_t + PP_t)(1+i) - W_t - C_t + R_t + PI_t \\
&\qquad \text{(by cancelling a number of terms)} \\
&= (A_{t+1} - L_{t+1}) - (U_{t+1} + V_t) \\
&\quad - [PP_t + C_t - (R_t - W_t + PI_t - iPP_t)] \\
&\qquad \text{(by rearrangement)} \\
&= (A_{t+1} - L_{t+1}) - U_{t+1} \\
&\quad - [PP_t + C_t - (R_t - V_t - W_t + PI_t - iPP_t)] \\
&= (A_{t+1} - L_{t+1}) - U_{t+1} - PP_{t+1}
\end{aligned}$$

Therefore the result is true for t + 1, so is true for all t by induction.

QED

5.4.7 If re-spreading is adopted, then it would seem logical to apply it to any initial surplus being amortized in aggregate with subsequent surplus. The variation in regular cost for the year beginning at time t would therefore be: –

$$V_t + W_t = (U_t + US_t) \times \text{Amortization factor}$$

5.4.8 If separate spreading is to be used, then the variation in regular cost for the year beginning at time t will be $V_t + W_t$, where

$$V_t = (A_o - L_o) \times F(t)$$

$$W_t = \sum_{s=0}^{t-1} S_s \times F(s, t)$$

where F (s,t) is the amortization factor applicable in the year beginning at time t to surplus arising in the year beginning at time s, and F(t) is the amortization factor applicable in the year beginning at time t to the initial surplus.

5.4.9 In the case of separate spreading, it is necessary for the amortization factor to depend on the year the surplus occurred because it will be based on the full or average expected remaining working lifetime of the active membership at that time.

5.4.10 We have now completed the development of a theoretical framework for SSAP 24. The results of this and the last chapter are set out for practical application in the worksheets in Appendix 1 together with a numerical example in Appendix 2. We trust actuaries (and accountants) will find these worksheets useful in their SSAP 24 work. Many actuaries will be familiar with similar worksheets which are available for FAS 87.

6. TREATMENT OF INCENTIVE PAYMENTS RECEIVED UNDER THE SOCIAL SECURITY ACT 1986

6.1 The problem

6.1.1 One point sometimes at issue under SSAP 24 is how to treat any incentive payments received under the Social Security Act 1986 for a newly contracted-out scheme. The payment is an extra contribution from the Department of Social Security directly to the trustees of the pension scheme. We would argue that it cannot be looked upon directly as a company contribution.

6.1.2 If the incentive is being applied purely for the member's benefit, i.e. extra benefits are being granted or benefits are being secured on a money purchase basis, it can properly be ignored for SSAP 24 purposes, provided of course the equal value of the additional benefits is also ignored. However, if it is being used to reduce company pension costs we believe there is no formally correct method.

6.2 Solutions

6.2.1 One method would be to establish the surplus in the scheme taking into account the value of incentive payments likely to be received. However, where a past service costing method is being used, this would be taking into account the value of monies due to be received in the future which is somewhat of a contradiction.

6.2.2 On balance, we prefer to take the value into surplus and then spread it over the employees' average working lifetime, or place the value in the balance sheet if the prior year basis has been adopted. However, the latter could be argued to be imprudent as the sums involved are payments yet to be received and do not really result from past trading. If the payments are used to reduce the regular pension costs for the years they are received, it could be argued this represents a misrepresentation of the company's true long-term pension costs. If this direct reduction route is followed and the effect is material we believe it should be disclosed as giving rise to a future likely change in the level of the company's pension costs (in the same way as a change in cost due to a change in benefit levels would have to be disclosed).

6.2.3 Some actuaries and accountants have decided in some cases that the effect of the rebates is not material. The payments have not been taken into account immediately and they have left the value to emerge as surplus at the next valuation (with the value then being spread over the then average working lifetime).

7. **SSAP 24 AND FAS 87 COMPARED**

7.1 **Introduction**

7.1.1. In this chapter, we consider:

- ★ To what extent SSAP 24 and FAS 87 are the same;
- ★ How SSAP 24 and FAS 87 differ; and
- ★ Whether it is possible to use the same pension cost figure for SSAP 24 and FAS 87.

7.2 **The extent to which SSAP 24 and FAS 87 are the same**

7.2.1 If the actuarial assumptions are borne out in practice, FAS 87 (the U.S. accounting standard for pension costs) essentially defines pension cost under the projected unit method, as follows: –

Regular cost ; less
Interest on current surplus ; less
Amortization of the capital elements of initial and subsequent surplus.

On the face of it, this appears conceptually different to the SSAP 24 pension cost formula developed in chapters 4 and 5. However, the results in 7.2.2 below show that they are, in fact, conceptually the same.

7.2.2 *If the FAS 87 expected investment return assumption is set equal to the discount rate and provision in the assumptions is made for pension increases then FAS 87 pension cost can be expressed in SSAP 24 form. Conversely, SSAP 24 pension cost can be expressed in FAS 87 form.*

Proof: Using the notation of 4.2.7 and 5.4.3, FAS 87 pension cost amounts to:

$$R_t - i(A_t - L_t) - (V_t - iU_t) - (W_t - iUS_t)$$

$$= R_t - V_t - W_t - i(A_t - L_t - U_t - US_t)$$
$$= R_t - V_t - W_t - iPP_t \qquad \text{(from 5.4.6)}$$

which is SSAP 24 pension cost (see 5.4.5).

QED

7.3 **Differences between SSAP 24 and FAS 87**

7.3.1 Despite the fact that SSAP 24 was issued almost two and a half years after FAS 87, one could be forgiven for thinking that the authors of SSAP 24 were not aware of the existence of FAS 87, such are the wide differences between the two standards.

7.3.2 Although FAS 87 has its faults, it is much closer to being a "standard" for determining pension costs compared with the large degree of flexibility inherent in SSAP 24 as discussed in the remainder of this paper. Indeed, why was it felt necessary to build in so much flexibility to SSAP 24? Was it hatred of the rigidity of one actuarial method? Are we in the United Kingdom, afraid so much of expensing overriding funding that we fail to adopt a standard for expensing?

7.3.3 The Canadians, it could be argued, adopted a fairly sensible approach when they issued their CICA standard two years after FAS 87. This standard is very similar to FAS 87 but one of the most heavily critisied features of FAS 87 was "remedied", in that long term actuarial assumptions are required to be used instead of the market related assumptions of FAS 87.

7.3.4 The differences between SSAP 24 and FAS 87 can pose problems for those companies who have to comply with both standards (e.g. UK subsidiaries of US multi-nationals) and who wish to report only one pension cost figure. We therefore set out the differences between SSAP 24 and FAS 87 in this section and then consider in the next section how a single pension cost figure can fulfil the requirements of both standards.

7.3.5 The main differences between the two standards are as follows: –

	SSAP 24	FAS 87
Implementation	Financial years commencing after 30th June 1988.	For non-US schemes, financial years commencing after 14th December 1988, although earlier compliance was encouraged.
Costing method	The method which, taken in conjunction with the assumptions, produces the actuary's best estimate of the cost of the benefits. The regular cost should be a reasonably stable percentage of pensionable payroll.	The projected unit method must be used. In addition benefits which do not accrue with service (e.g lump sum death-in-service benefits) should be costed on an accrued service/service to expected date of payment basis.
Actuarial assumptions	The assumptions, taken as a whole, should be compatible with the costing method and produce the actuary's best estimates of the costs of providing the benefits.	The assumptions are chosen by management, usually in conjunction with the actuary, and must be acceptable to the company's auditors as meeting the requirements of FAS 87. The discount rate used to value the liabilities should be a rate at which the liabilities could be settled at the beginning of the financial year and is therefore likely to reflect (and vary with) long term gilt yields. In addition, a separate assumption is required for the expected long term return on the scheme assets. Each assumption must be a best estimate on an individual (rather than overall) basis.
Asset valuation	As deemed appropriate by the actuary.	Market value, or a smoothed value which recognises differences from market value over a period not longer than five years.
Pension increases	If discretionary pension increases are regularly provided, the preferred treatment is to allow for them in the costing. If they are not allowed for in the the costing, the capital cost must be accounted for in the period in which they are granted.	A 'substantive commitment'' to future pension increases should be allowed for in the costing. Otherwise the cost of each pension increase should be treated as a benefit amendment and amortized as set out below.
Initial surplus/ deficiency	Option to recognise immediately on the balance sheet or amortize over the full or average expected working lifetime of the active membership. Method of amortization is flexible, so long as it is systematic and rational.	Straight line amortization (see 5.3.4) over the expected average working lifetime of the active membership. No option to recognise immediately on balance sheet.
Subsequent surplus/deficiency	To be amortized over the full or average expected working lifetime of the active membership. Method of amortization is flexible although it should be consistent with that adopted for initial surplus/deficiency (if any). Separate spreading or re-spreading in conjunction with initial surplus allowed (see 5.4).	To be amortized over (at most) the average expected working lifetime of the active membership, but option to amortize subsequent surplus/ deficiency only in excess of the ''10% corridor'' (= 10% of greater of value of assets and target fund). Must be spread separately from initial surplus but otherwise re-spreading applies.

Changes in actuarial assumptions	As for subsequent surplus/deficiency.	As for subsequent surplus/deficiency
Benefit amendments	As for subsequent surplus/deficiency.	To be separately identified. The preferred method of amortization is straight line over the full expected working lifetime of the active membership but the straight line method over the average expected working lifetime may be used as an option.
Balance sheet recognition	Apart from the option to recognise initial surplus/deficiency, only the difference between cash contributions and pension cost has to be shown on the balance sheet.	As well as the difference between cash contributions and pension cost, any excess of the current salaries past service liability over the market value of the assets must be shown as an additional balance sheet liability, with possibly an offsetting intangible asset.

7.4 Achieving the same pension cost under SSAP 24 and FAS 87

7.4.1 Although we saw under 7.2 that SSAP 24 and FAS 87 pension costs are conceptually the same, 7.3 highlighted a number of more detailed differences which could pose problems to companies wishing to use the same pension cost figure under both standards.

7.4.2 Most of the problems can be solved as we shall see in 7.4.5. However, there are two hurdles which could be difficult to overcome, these being:

★ The market-related nature of FAS 87 assumptions compared with the inherent long term nature of the assumptions under SSAP 24.

★ If FAS 87 was implemented before SSAP 24, it may be virtually impossible to reconcile the amortizations of surplus.

7.4.3 The main problem with the assumptions is the FAS 87 discount rate. In recent times, long term gilt yields have been between 9% and 10% p.a. which is probably the region in which most UK actuaries' best estimate long term investment return assumption lies. Moreover, to date auditors appear on the whole to have taken a fairly relaxed attitude to the selection of FAS 87 assumptions. However, if long term gilt yields should move away from the 9% to 10% p.a. range and auditors become more strict on the selection of FAS 87 assumptions, then it could be difficult to keep FAS 87 and SSAP 24 assumptions the same. Although SSAP 24 does not expressly prohibit the use of market-related assumptions, the assumptions are required to be the actuary's best estimate and given the long term nature of the assumptions it would seem difficult to justify a different best estimate every year.

7.4.4 The problem of different implementation dates is only likely to occur if FAS 87 was adopted early. If this was the case, then there is very little that can be done except to try and ensure that as far as possible all other aspects are the same, in which case the difference between the FAS 87 and SSAP 24 figures may not be material.

7.4.5 In order to eliminate other differences between SSAP 24 and FAS 87, it is necessary to select certain options/approaches under both SSAP 24 and FAS 87. Again, this may not be possible if FAS 87 has already been adopted because consistency will be required from one year to the next. The options/approaches which should be selected (if possible) to try and achieve the same SSAP 24 and FAS 87 pension costs are as follows: –

Under SSAP 24:

★ Use the projected unit costing method and cost benefits which do not accrue with service in the FAS 87 manner. This should be possible under SSAP 24 provided the age profile can be expected to be reasonably constant from year to year, which is the case for most schemes open to new entrants.

- ★ Value assets using the FAS 87 market-related method (market value at date of compliance). We would anticipate that many actuaries could reconcile this method with the "best estimate" principle but recognise that some advocates of the discounted income asset valuation method may have problems.
- ★ If there is a "substantive commitment" to discretionary pension increases, then make advance provision in the costing.
- ★ Amortize the initial surplus or deficiency over the average working lifetime of the scheme membership using the straight line method.
- ★ Aggregate all subsequent surpluses/deficiencies and effects of changes in actuarial assumptions and re-spread over the average remaining working lifetime of the scheme membership using the straight line method, but continue to amortize the initial surplus/deficiency separately.
- ★ Amortize the costs of benefit changes separately over the average remaining working lifetime of the membership using the straight line method.

Under FAS 87:

- ★ If possible, choose the same assumptions as for SSAP 24 purposes, and set the expected investment return equal to the discount rate (which to date appears to be a practice not questioned by auditors).
- ★ Value assets by the market-related method (market value is required at date of compliance).
- ★ If there is a substantive commitment for discretionary pension increases then the same advance provision should be included in the costing as for SSAP 24.
- ★ Elect not to use the 10% corridor for subsequent surpluses/deficiencies and the effects of changes in valuation assumptions, and aggregate and re-spread over the average working lifetime in accordance with FAS 87.
- ★ Amortize the costs of benefit amendments over the average expected remaining working lifetime.

7.4.6 Most of the obstacles can therefore be overcome in bringing SSAP 24 and FAS 87 pension cost figures together, but problems could arise in the selection of assumptions (more in the medium to long term than the short term) and with different dates of compliance.

7.4.7 Whilst having the same pension cost figures for SSAP 24 and FAS 87 purposes has the appeal of simplicity, this may not be to a company's best advantage. As mentioned in 5.3.10, if a UK company is a subsidiary of a US corporation, then it will only need to report SSAP 24 pension costs for its local UK statutory accounts. If the company's pension scheme is in substantial surplus, then an election to recognise immediately this surplus on the balance sheet when SSAP 24 is first adopted could lead to a significant increase in local borrowing powers. The locally reported profits will be lower as a result of this election, but this may not be considered that relevant since share price will largely be determined by the US corporate accounts for which (a probably lower) pension cost will have been reported under FAS 87.

8. TOO MUCH CHOICE, TOO LITTLE DISCLOSURE?

8.1 Too much choice?

8.1.1 The early indications are that full use will be made of the flexibility permitted. As we have already mentioned, a wide range of actuarial assumptions is being adopted. In the early cases, the projected unit method has been the most common actuarial method used but the entry age and attained age methods have been seen. Both alternatives under the transitional arrangements have been adopted with, where applicable, different methods of spreading being used. We have set out in Appendix 3 a brief survey of the costing methods, transitional arrangements and assumptions that have been adopted.

8.1.2 Different priorities lie behind the choices made. Some managements initially took the attitude that budgeting and profit forecasting had already taken place for the year of adoption and they wished the introduction of the standard to have as little effect as possible. Others have used the flexibility available within the standard to give the maximum short term boost to profits. The results we proved in 5.2 have very relevant implications here for the future. For some companies, especially those in short term contribution holidays, the wish to avoid a provision for expensing costs in the balance sheet is the deciding factor. Some of these companies have decided to follow the prior year route and have placed the surplus in the balance sheet.

8.2 Too little disclosure?

8.2.1 It could be argued that the underlying philosophy of SSAP 24 is as follows. No one actuarial method or set of assumptions is appropriate in all cases and adequate comparisons of pension costs between different companies can be made without this rigidity as long as adequate disclosure is made. We believe that if this philosophy is to hold several quite simple additions to the disclosure requirements are necessary. If this is not done, we believe that in the United Kingdom we may ultimately have to move towards the approach adopted in the United States, i.e. one actuarial method and one method of spreading.

8.2.3 Let us consider the example mentioned in 5.3.6. There is a difference in the first year's net pension cost (and hence declared profits) of just under £0.5 million between spreading the surplus as a percentage of salaries and using the straight line method. Many investors value companies by applying price earnings multiples. Using a price earnings multiple of 15 such investors would be placing a value of approximately £7.5 million more on the company if the straight line method rather than the percentage of salaries method had been used for spreading. The disclosures would have been the same apart from the different net pension costs. In practice the only difference in the true worth is that under the straight line method the total of the profits in subsequent years will be approximately £0.5 million less (not £7.5 million more). This is the practical effect of the results we proved in 5.2.

8.2.4 Many of the disclosures seen to date appear to be deficient in one or two items. However, they have generally contained enough actuarial information for the strength of the assumptions used to be seen. There are two possible exceptions. The first is that sometimes the rate of dividend growth is missing when a discounted income approach has been used for the valuation of assets. The second is that it is not always clear whether a promotional salary scale has been used. Sometimes when a low real return above earnings inflation is being adopted, the overall strength of the assumptions may be the same as when a higher real return has been used in conjunction with an undisclosed promotional salary scale.

8.2.5 The current disclosure requirements demand details of the expected effects on future costs of any material changes in the group's and/or company's pension arrangements. SSAP 24 does not require any disclosure of likely material changes in pension costs due to the way the statement has been adopted. This would seem to be essential if SSAP 24 is to achieve its aims.

8.2.6 Hence for the disclosure requirements to be made adequate yet remain simple we feel the following items need to be added:

- ★ An indication of the expected average remaining working lifetime or expected remaining working lifetime depending which has been used. This would also be useful information, should the reader of the accounts wish to look at the approximate effect of adopting a different set of assumptions.
- ★ An indication of the spread method used. This could be done by mentioning "percentage of salaries", "straight line" or "mortgage" method.

- ★ An indication of which method was used for the transitional arrangements, i.e. prior year or spreading. We suggest this indication should remain until the end of the expected remaining working lifetime or expected average remaining working lifetime at the date of adoption of SSAP 24.
- ★ The present disclosure rules do not require a split of the net pension cost between regular cost and variation. We suggest this should be a requirement. Also if any prepayment or provision is included in the balance sheet, the interest on this item passing through the profit and loss account should be disclosed separately. This has been done in most of the accounts we have seen for companies which have followed the prior year route on adoption of SSAP 24. SSAP 24 itself would appear not specifically to require it.
- ★ An explanation of the treatment of expensing any discretionary pension increases.
- ★ A note as to whether separate spreading or re-spreading of surplus/deficiency has been adopted.

8.2.7 We believe that if the above simple items were added to the disclosure requirements they would be far more meaningful yet remain reasonably brief. An actuary would be able to assess the likely future trend in pension costs, if the assumptions are borne out, and would also be able to see clearly (as at present) the strength of the actuarial method and assumptions adopted. The extra information given would also enable the effect of changes in these assumptions to be estimated more accurately by an actuarial reader of the accounts.

8.2.8 But should a proper analysis of a company's accounts require the input of an actuary? Whilst this might be good news for consulting actuaries, we question whether it is in the public interest. Also, some may argue that after such additions the information disclosed would be too long and complicated. The alternative would be to adopt one spread method and one actuarial method. This would mean a movement towards the American and Canadian Standards. As with the American and Canadian Standards, variations could still occur in the assumptions adopted but they would, as at present, be required to be disclosed. This may happen anyway if, in the long term, a more restrictive international standard for pension costs than International Accounting Standard No. 19 is adopted. If one spread method were to be adopted we suggest that the straight line method should be the one to use. We believe this is justified by our comments in sections 5.3.14 to 5.3.16, and a wish to be consistent with the American and Canadian Standards.

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REFERENCES

1. Financial Accounting Standards No. 87: Recursion formulas and other related matters by B. N. Berin and E. P. Lofgren. Transactions of the Society of Actuaries, Volume XXXIX, 1987.

APPENDIX 1 : SSAP 24 WORKSHEETS

The following worksheets are based on the theoretical development of SSAP 24 set out in chapters 4 and 5. An example is given of their application in Appendix 2.

SSAP 24 WORKSHEETS

1. Amortization of initial surplus/deficiency – separate spreading

Initial surplus (deficiency) ________ (S)

(1) Year commencing	(2) Remaining surplus (deficiency) to be amortized at BOY	(3) Amortization factor	(4) Surplus (deficiency) amortization in year (S) x (3) (To 3 (2))	(5) Remaining surplus (deficiency) to be amortized at EOY [(2)x(1+i)] −(4)

NB: Only complete this worksheet if "separate spreading" of surplus/deficiency is to apply.

2. Amortization of subsequent surplus/deficiency – separate spreading

YEAR: ____

(1)	Values of assets at BOY	________
(2)	Value of target fund at BOY	________
(3)	Surplus (deficiency) at BOY ((1) – (2))	________
(4)	Value of assets at beginning of previous year	________
(5)	Value of target fund at beginning of previous year	________
(6)	((4) – (5)) x (1+i)	________
(7)	Company contributions in previous year	________
(8)	Net regular cost in previous year (5 (6) from previous year)	________
(9)	Expected surplus (deficiency) at BOY ((6)+(7)–(8))	________
(10)	Capital cost of pension increases expensed in previous year (5 (10) from previous year)	________
(11)	Surplus/(deficiency) arising in previous year ((3) – (9) + (10))	________

(12) Year commencing	(13) Remaining surplus (deficiency) to be amortized at BOY	(14) Amortization factor	(15) Surplus (deficiency) amortization in year (11) x (14) (To 3(2))	(16) Remaining surplus (deficiency) to be amortized at EOY [(13)x(1+i)] – (15)
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________
________	________	________	________	________

NB: Only complete this worksheet if "separate spreading" of surplus/deficiency is to apply.

3. Consolidated amortization schedule – separate spreading

(1) Year of recognition	(2) Surplus/deficiency amortization amount (from 1(4) or 2(15)) Year surplus/deficiency arose	(3) Total amortization (Σ(2))

(to 5 (7))

SSAP 24 WORKSHEETS

4. Amortization of aggregate surplus/deficiency – re-spreading

		YEAR: ________
(1)	Value of assets at BOY	________
(2)	Value of target fund at BOY	________
(3)	Prepayment (provision) at BOY (from 6 (1))	________
(4)	Unrecognised surplus (deficiency) at BOY ((1)–(2)–(3))	________
(5)	Amortization factor	________
(6)	Variation in regular cost for year ((4) x (5))	________
		(to 5 (7))

NB: Only complete this worksheet if ''re-spreading'' of surplus/ deficiency is to apply.

5. Net pension cost

YEAR: ________

Regular Cost

(1) Total regular cost at BOY (including members' contributions) ________

(2) Expected members' contributions in year ________

(3) Actual company contributions in year ________

(4) Allowance for administration expenses in year ________

(5) Interest $(i((1) - \frac{1}{2}((2) + (3) - (4))))$ ________

(6) Net regular cost at year end ((1)−(2)+(4)+(5)) ________

Variation in regular cost

(7) Amortization for year (3(3) or 4(6)) ________

Pension increases

(8) Capital cost of pension increases granted in year required to be expensed (calculated at date increases effective) ________

(9) Number of months between effective date of increase and year end ________

(10) Cost of increases at year end $((8)(1 + \frac{i(9)}{12}))$ ________

Interest on prepayment

(11) Prepayment (provision) at beginning of year (6 (1)) ________

(12) i x (11) ________

Net pension cost

(13) (6) − (7) + (10) − (12) ________

6. Balance sheet prepayment/provision

YEAR: ________

(1)	Prepayment (provision) at BOY	________
(2)	Company contributions paid in year	________
(3)	Net pension cost for year (5 (13))	________
(4)	Prepayment (provision) at EOY ((1) + (2) − (3))	________

APPENDIX 2 : EXAMPLE OF USE OF SSAP 24 WORKSHEETS

The following example demonstrates the use of the worksheets. It incorporates the following:

★ The example is for the company financial year beginning 1st January 1990, this being the second year of compliance with the standard.

★ *Separate spreading of surplus has been adopted.*

★ The initial surplus has been amortized.

★ The amortization method is "straight line".

★ Amortization is over the expected average working lifetime which is assumed to be 10 years, both at 1st January 1989 and 1st January 1990.

★ The assumed rate of investment return for costing purposes is 9% p.a.

SSAP 24 WORKSHEETS

1. Amortization of initial surplus/deficiency – separate spreading

Initial surplus (deficiency) 1,000,000 (S)

(1)	(2)	(3)	(4)	(5)
Year commencing	Remaining surplus (deficiency) to be amortized at BOY	Amortization factor	Surplus (deficiency) amortization in year (S) x (3) (To 3 (2))	Remaining surplus (deficiency) to be amortized at EOY [(2)x(1+i)] – (4)
1.1.89	1,000,000	0.190	190,000	900,000
1.1.90	900,000	0.181	181,000	800,000
1.1.91	800,000	0.172	172,000	700,000
1.1.92	700,000	0.163	163,000	600,000
1.1.93	600,000	0.154	154,000	500,000
1.1.94	500,000	0.145	145,000	400,000
1.1.95	400,000	0.136	136,000	300,000
1.1.96	300,000	0.127	127,000	200,000
1.1.97	200,000	0.118	118,000	100,000
1.1.98	100,000	0.109	109,000	0

NB: Only complete this worksheet if "separate spreading" of surplus/deficiency is to apply.

SSAP 24 WORKSHEETS

2. Amortization of subsequent surplus/deficiency – separate spreading

YEAR: 1990

(1)	Values of assets at BOY	21,000,000
(2)	Value of target fund at BOY	20,000,000
(3)	Surplus (deficiency) at BOY ((1) – (2))	1,000,000
(4)	Value of assets at beginning of previous year	20,000,000
(5)	Value of target fund at beginning of previous year	19,000,000
(6)	((4) – (5)) x (1 +i)	1,090,000
(7)	Company contributions in previous year	0
(8)	Net regular cost in previous year (5 (6) from previous year)	500,000
(9)	Expected surplus (deficiency) at BOY ((6)+(7)–(8))	590,000
(10)	Capital cost of pension increases expensed in previous year (5 (10) from previous year)	0
(11)	Surplus/(deficiency) arising in previous year ((3) – (9) + (10))	410,000

(12) Year commencing	(13) Remaining surplus (deficiency) to be amortized at BOY	(14) Amortization factor	(15) Surplus (deficiency) amortization in year (11) x (14) (To 3(2))	(16) Remaining surplus (deficiency) to be amortized at EOY [(13)x(1+i)] –(15)
1.1.90	410,000	0.190	77,900	369,000
1.1.91	369,000	0.181	74,210	328,000
1.1.92	328,000	0.172	70,520	287,000
1.1.93	287,000	0.163	66,830	246,000
1.1.94	246,000	0.154	63,140	205,000
1.1.95	205,000	0.145	59,450	164,000
1.1.96	164,000	0.136	55,760	123,000
1.1.97	123,000	0.127	52,070	82,000
1.1.98	82,000	0.118	48,380	41,000
1.1.99	41,000	0.109	44,690	0

NB: Only complete this worksheet if "separate spreading" of surplus/deficiency is to apply.

SSAP 24 WORKSHEETS

3. Consolidated amortization schedule – separate spreading

(1) Year of recognition	(2) Surplus/deficiency amortization amount (from 1(4) or 2(15)) Year surplus/deficiency arose															Total amortization (Σ(2))
	1989–	1989														
1989	190,000															190,000
1990	181,000	77,900														258,900
1991	172,000	74,210														
1992	163,000	70,520														
1993	154,000	66,830														
1994	145,000	63,140														
1995	136,000	59,450														
1996	127,000	55,760														
1997	118,000	52,070														
1998	109,000	48,380														
1999		44,690														
2000																
2001																
2002																
2003																

(to 5 (7))

5. Net pension cost

YEAR: 1990

Regular Cost

(1)	Total regular cost at BOY (including members' contributions)	850,000
(2)	Expected members' contributions in year	400,000
(3)	Actual company contributions in year	0
(4)	Allowance for administration expenses in year	50,000
(5)	Interest $(i((1) - \frac{1}{2}((2) + (3) - (4))))$	60,750
(6)	Net regular cost at year end ((1)−(2)+(4)+(5))	560,750

Variation in regular cost

(7)	Amortization for year (3(3) or 4(6))	258,900

Pension increases

(8)	Capital cost of pension increases granted in year required to be expensed (calculated at date increases effective)	0
(9)	Number of months between effective date of increase and year end	
(10)	Cost of increases at year end $((8)(1 + \frac{i(9)}{12}))$	0

Interest on prepayment

(11)	Prepayment (provision) at beginning of year (6(1))	(310,000)
(12)	i x (11)	(27,900)

Net pension cost

(13)	(6) − (7) + (10) − (12)	329,750

SSAP 24 WORKSHEETS

6.	**Balance sheet prepayment/provision**	**YEAR:** 1990
1)	Prepayment (provision) at BOY	(310,000)
2)	Company contributions paid in year	0
3)	Net pension cost for year (5 (13))	329,750
4)	Prepayment (provision) at EOY ((1) + (2) − (3))	(639,750)

APPENDIX 3 : A BRIEF SURVEY OF THE COSTING METHODS, TRANSITIONAL ARRANGEMENTS AND ACTUARIAL ASSUMPTIONS THAT HAVE BEEN ADOPTED

The following table sets out the results of a brief survey we have undertaken to ascertain how SSAP 24 has been applied in practice.

Company	Actuarial method	Surplus transitional arrangement adopted	Actuarial assumptions			
			Investment return p.a.	Dividend growth p.a.	Pensionable earnings growth p.a.	Post retirement pension increase p.a.
A	Projected unit	Prior year	10%	5.5%	7%	n/m
B	Projected unit	Extraordinary credit to profit and loss	8%	n/m	6%	4.25%
C	Projected unit	Spread forward	Investment return: 2% over increase in earnings, 4.5% higher than pension increases, 4.5% higher than increase in dividends			
D	Projected unit	No residual surplus	9%	n/m	8%	n/m
E	Projected unit	Spread forward	Investment return: 2% over increase in earnings, 4% over increase in pensions			
F	Projected unit	Spread forward	Investment return: 2% over increase in earnings, 4.0% higher than present and future pensions increases			
G	Attained age	Spread forward	8%	n/m	7%	5%
H	Attained age	Prior year	8.5%	n/m	7.5%	Nil
I	Entry age	Spread forward	10%	n/m	7%	5%
J	Entry age/Aggregate cost	No surplus/deficit	9%	4%	7.5%	n/m

Company	Actuarial method	Surplus transitional arrangement adopted	Actuarial assumptions			
			Investment return p.a.	Dividend growth p.a.	Pensionable earnings growth p.a.	Post retirement pension increase p.a.
K	n/m	Prior year	10%	n/m	8%	n/m
L	n/m	Effect insignificant	10%	5.5%	8%	4%
M	Projected unit	Prior year	Investment return: 1.5% above earnings inflation			
N	Attained age	Prior year	Investment return: 2% above earnings inflation			
O	Projected unit	Spread forward	Investment return: 2% above earnings inflation			
P	Projected unit/ Attained age	Spread forward	Investment return: 2% above earnings inflation			
Q	Projected unit	Spread forward	9%	5%	7%	n/m
R	Projected unit	Prior year	Investment return: 2% above earnings inflation			
S	Attained age	Spread forward	Investment return: 1% above earnings inflation			
T	Projected unit	Prior year	Investment return: 2% above earnings inflation			
U	Projected unit	Spread forward	Investment return: 2% above earnings inflation			
V	Projected unit	Spread forward	Investment return: 2% above earnings inflation			

Notes: n/m means not mentioned