



InFocus Document
Analysis of Surplus

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1 Scope

The purpose of the Analysis of Surplus (AOS) is to compare the actual results of the current valuation with the expected results of the previous valuation and to breakdown the results between the possible sources of surpluses and deficiencies.

Effectively, the previous valuation must be rolled forward to the current valuation date giving the expected results. These are then compared with the results of the current valuation – the actual results. In doing so, each of the possible sources of surplus/deficiency must have its contribution to the overall surplus/deficiency calculated individually.

Sources of surplus/deficiency can be divided into two types:

1. Cash B Cash receipts/payments during the inter-valuation period which arises from the payment of pensions and contributions; and
2. Changes in reserves required for future cash receipts/payment (i.e. after the current valuation date) arises from the decrements in the inter-valuation period.

2 Data Requirements for the AOS calculations

2.1 Member Data

As the previous valuation results have to be rolled forward to the current valuation date and compared with the current valuation results, all the member data input to the previous and current valuations is required. This data is held at individual member data level within member status (Actives, Deferreds and Pensioners).

The AOS data must include data as at the current valuation date and also as at the previous valuation date. The data required is the same data items for the current valuation and the previous valuation. SuperVal has the functionality to validate and blend files of the current and the previous valuation data called the "Data Merge".

A unique identifier (MEMNO) will be required in both the current and the previous valuation data to proceed with the Data Merge.

The following numeric fields should be present in the valuation data files.

All Modules	Actives	Deferreds	Pensioners
Unique identifier (MEMNO)	Date joined Company (DJS)	Pre 88 GMP (GMP0)	Pre 88 GMP (GMP0)
Name (NAME)	Date joined Scheme (DJF)	Post 88 GMP (GMPE0)	Post 88 GMP (GMPE0)
Category (CAT)	Salary (SAL)	Leaving Date (LD)	Date Pension Commenced (DPC)
Date of Birth (DOB)	Previous Salary (PSAL)		Member or Spouse (MEMORSP)
Sex (SEX)			

The following numeric fields should have entries in the current valuation data.

Actives	Deferreds	Pensioners
Mode of Exit (MOE)	Mode of Exit (MOE)	Mode Ceased Pension (MOT)
Date of Exit (DOE)	Date of Exit (DOE)	Date Ceased Pension (DOT)
Lump sum benefit on Exit (BOE)	Benefit upon Termination (BOT)	Benefit upon Termination (BOT)
		Total Pension Paid (TPP)
		Types of Pension (TOP)

2.2 Steps to follow for “Data Merge”

- 1) Two data files, one with current valuation data and one with previous valuation data. These files need to be saved as .csv files in the input folder. The filenames of the data files should be saved without spaces. These files should be saved in the same format as data files for regular valuations. The first row contains the names of the variables and the second row contains the data format (character, numeric or date format).
- 2) There needs to be a unique identifier in both data files so as to match the records. This column MUST be named as MEMNO.
- 3) Log onto SuperVal and select Data > Data Merge
- 4) The Data Merge form will ask you for:
 - a. the current valuation data file (.csv).
 - b. the previous valuation data file (.csv).
 - c. the membership type of the data (Actives, Deferreds or Pensioners)
 - d. the name of the merge file to be created.

The screenshot shows a software window with a menu bar containing 'File' and 'Help'. The main area contains four dropdown menus for file selection:

- Current Input Data File: Pensaosdata.csv
- Previous Input Data File: Pensaosdata2.csv
- Input Data Type: Actives
- Merged Output Data File: Pensaosdatamerge.csv

At the bottom left, the text '[unnamed]' is displayed. At the bottom right, there are five buttons: 'Run', 'Save As', 'Save', 'Quit', and 'Help'.

- 5) Please note the new .csv file that has been created will have data from the current valuation and previous valuation merged. The columns created from the previous valuation data file will have the names of the variables prefixed by '#'. An example of the Active data file is shown in Appendix 1.
- 6) Once the Data Merge is complete a Data Build is required to get the data ready for an AOS valuation.

3 AOS Parameter Set Up

3.1 Actives set up

The AOS parameters can be accessed from: Bases>Scheme>Analysis of Surplus>Actives Parameters. Here there are four Modes of Exit available, namely:

- Retirement
- Death in Service
- Ill Health Retirement
- Withdrawal

The Modes of Exit will be set according to what has been entered in the data file. For instance, the example in Appendix 1 shows that the Modes of Exit were as follows:

D – Death in Service

I – Ill Health Retirement

R – Normal Retirement

W – Withdrawal

E – Early Retirement

These letters are not hard coded, they are user defined. The Modes of Exit should be defined as a single character. You can have multiple Modes of Exit defined in a particular field e.g. an Early Retirement (E) and a Normal Retirement (R) can be defined in the Retirement Mode of Exit field by double clicking on the field as highlighting the two characters E and R.

3.2 Deferreds set up

In the AOS Parameters Setup for the Deferreds Module there are two Modes of Termination available namely:

Retirement

Death In Deferment

3.3 Pensioners set up

In the AOS Parameters Setup for the Pensioners Module there is one Mode of Termination available which is Death.

4 Valuation Run

Once the data and the basis are ready in SuperVal, the valuation run can be set up. Under Scheme Details (File>Properties), the user must first specify that Analysis of Surplus Calculations are required.

The screenshot shows the 'Data' tab of the 'Scheme Details' window. The 'Dates' section has 'Current Valuation Date' set to 31/12/2011 and 'Previous Valuation Date' set to 31/12/2008. The 'Data Files' section has three rows: 'Main Actives Data File', 'Main Deferreds Data File', and 'Main Pensioners Data File', each with a corresponding 'Format of Main' dropdown menu. The 'Defaults' section has three checkboxes: 'PPF Calculations required' (checked), 'Non-PPF Capped Calculations required' (checked), and 'Analysis of Surplus Calculations required' (checked and highlighted with a red box). There is also an unchecked checkbox 'Use single character Basis Category when Saving Bases'. At the bottom right are 'Save', 'Quit', and 'Help' buttons.

To set up the valuation run: check the Analysis of Surplus box in the Batch Setup (Valuation>Batch Run>Add Runs).

The screenshot shows the 'Valuation Run Options' dialog box. It has several sections: 'Sex Selection' (Both), 'Test Valuation Run' (No), 'Control Period' (1 years), 'Target Accrued Benefit' (Past Service Liability), 'New Entrant Model Parameters' (empty), and 'Valuation Date' (Current). There are several checkboxes: 'Interpolated Exact Age Results' (unchecked), 'Aggregate Benefits before Valuing' (unchecked), 'Insured Benefits in Normal Cost' (unchecked), 'New Entrant Model Replacement' (unchecked), 'Analysis of Surplus' (checked and highlighted with a red box), 'Cap Accrued Benefits' (unchecked), and 'S143 Entry Valuation' (unchecked).

5 Results

The aim of the AOS valuation is to analyse the "expected" liability build-up for each member and allowing "actual" accounting information to be blended in with these results.

To enable the calculation of the reserve build-up and the emerging surpluses/strains that are analysed for each member individually, it is necessary to value each member twice; first, at the later of the Previous Valuation Date or the Date of Entry and then at the earlier of the Date of Exit or the Current Valuation Date.

To enable the valuation calculations to be carried out at both dates, the relevant member information must be available at both these dates (although some approximations will be used in certain circumstances). This information is to be held in the one member data record for each member i.e. both current and previous valuation data is held in the one data record (steps followed in Section 2 of this document).

Obviously, this approach must assume that the exact same benefit definitions and valuation assumptions apply at both the current and previous valuation dates. Thus, additional runs are required to evaluate the effect of benefit changes or changes in the valuation assumptions used.

For all modules (Actives, Deferreds and Pensioners), the results of the AOS will be split according to the following groups:

- Starter Enders (in force at both the previous and current valuation date),
- New Entrant Enders (inter-valuation new entrants in force at current valuation date),
- Starter Exits (in force at the previous valuation date but exits prior to or on current valuation date), and
- New Entrant Exits (inter-valuation new entrant exits).

Additionally, for Deferreds and Pensioners, the results of the Analysis of Surplus are also split according to the Type of Pension data field. Grouped results are also produced for all the Types of Pension fields specified for each of the causes of exit (as specified in the Analysis of Surplus parameters screen).

These groupings of the results enable the association of results for members transferring between groups of members within the Scheme (for example, an Active member retiring to become a Pensioner). This association is necessary to correctly allocate the surplus, as in the case given a large surplus will emerge in the Active AOS (equal to the reserve required for pension benefits) and a corresponding strain will emerge in the Pensioner AOS.

To calculate the "expected values", a valuation is carried out for each member on the anniversary of the current valuation date either at or immediately prior to the latter of the date of entry or the previous valuation date. For each of the specific groups mentioned above, this valuation involves:

- | | |
|----------------------|---|
| Starter Enders - | projections of amounts at the Previous Valuation Date based on member data effective at that date, or

when the inter-valuation period is a non-integral number of years, projections of amounts (with appropriate linear interpolation in the first "short" year) at the anniversary of the Valuation Date prior to Previous Valuation Date based on member data effective at the Previous Valuation Date, |
| New Entrant Enders - | projections of amounts (with appropriate linear interpolation in the first "short" year) at the anniversary of Valuation Date prior to Entry based on member data assumed effective at the Entry Date, |
| Starter Exits - | as for Old Actives except appropriate linear interpolation will apply in the "short" Year of Exit also, and |
| New Entrant Exits - | as for New Actives except appropriate linear interpolation will apply in the "short" Year of Exit also. |

5.1 Active Results

The specific calculations for Active Members are set out below. Obviously many of the values are based on numbers generated from the valuation, and reference will be made to these values without explanation.

The specification will be illustrated by sample calculations based on the following members (whose results are displayed in Appendix 2, 3 and 4 respectively of this document).

- Starter Ender member valued using the Projected Unit Credit Method,
- New Entrant Ender member valued using the Attained Age Normal Method, and
- Starter Exit member valued using the Projected Unit Credit Method.

5.1.1 Contributions

The amounts of Expected and Actual contributions will be evaluated split into four groups:

- Member contributions,
- "Expected" Company contributions in respect of "Funded" benefits (based on recommended rates),
- Company contributions in respect of "Unfunded" (current cost) death benefits, and
- Company contributions in respect of "Unfunded" (current cost) ill-health benefits.

Additionally, the Company contributions required in respect of "funded" benefits will be evaluated (that is, the theoretically required contribution to maintain reserves).

Expected Contributions

All "Expected" Contributions (Member, Company Funded and Company Death and Ill-Health Current Cost) are based on the expected salary of the member, as projected in the valuation of the member at the later of the Date of Entry or the Previous Valuation Date assuming the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

An approximation may be applied if Expected Contributions are calculated as zero, for example when salary at Entry is not specified. These approximations are discussed in more detail below.

Thus, the calculations for the example members would be as follows (based on the rates of contribution as specified in the Contribution screens):

Starter Ender - Projected Unit Credit (Appendix 2)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Salary	32,508	33,808	35,161	-
Proportion Active	1.00	1.00	1.00	-
Member - 7.5%	2,438	2,536	2,637	7,611
Company - 12.5%	4,064	4,226	4,395	12,685
Current Cost - Death 2.5%	813	845	879	2,537
Current Cost - Ill Health 0%	0	0	0	0
New Entrant - Attained Age Normal (Appendix 3)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Salary	19,500	20,280	21,091	-
Proportion Active	0.25	1.00	1.00	-
Member - 7.5%	365	1,521	1,582	3,468
Company - 12.5%	609	2,535	2,636	5,780
Current Cost - Death 2.5%	122	507	527	1,156
Current Cost - Ill Health 0%	0	0	0	0

Note: Contributions are pro – rated in the year of Exit.

The "Required" rate of Company Contribution (which equals the theoretical contribution rate required to maintain reserves net of Member contributions) is calculated as part of the valuation process. This contribution rate also depends on the particular valuation method being used:

Projected Unit Credit -	Equal to the expected additional contributions (net of Member Contributions) for each year of additional service accrued (that is, the theoretically total contribution required for "funded" benefits net of member contributions, or effectively a projection of one year Normal Costs under the Projected Unit Credit method).
Attained Age Normal -	Equal to the PUC Normal Cost (see above).

Defined Accrued Benefit - Equal to the expected additional Company contributions (net of Member Contributions) required to maintain a reserve equal to the Defined Accrued Benefit, that is, the Reserve under this method.

The projection of Required Company Contributions are derived in the valuation of the member at the later of the date of entry or the previous valuation date assuming the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

Required Contributions are pro-rated in the year of Entry or Exit.

Actual Contributions

The Actual Member contributions are calculated by differencing the following data items, Accumulated Employee Contributions without Interest at the Previous Valuation Date (or Entry) and Current Valuation Date (or Exit).

The Actual Company contributions are calculated by differencing the following data items, Accumulated Employer Contributions without Interest at the Previous Valuation Date (or Entry) and Current Valuation Date (or Exit).

An approximation may be applied if Actual Contributions are calculated as zero or negative, for example, when an Accumulation of Contributions without Interest field at Exit is not specified. These approximations are discussed in more detail below.

Note that it is not mandatory that these Accumulated Contributions without Interest data fields be specified as the total Scheme amount of Actual member and Company contributions can be blended with the consolidated Analysis of Surplus results (replacing the approximate figure estimated by the system).

The Actual Company Current Cost Contributions in respect of Death and Ill-Health are derived from the Actual Member Contributions by applying the ratio of the Expected Rate of Current Cost Contribution over the Expected Rate of Member Contribution.

Contributions - Approximations

The following sets out the approximations made by system in respect of the calculation of Expected and Actual Contributions. Note that these calculations are generally designed to overcome insufficient member data, either on an overall Scheme level (for example, a Contributions without Interest data field that is not specified) or for specific members (such as missing data for New Entrants at Entry or for Exits at Date of Exit).

The approximation calculated may not be required as the corresponding amount may be available in the Scheme accounts or a more appropriate approximation may be possible based on other amounts in the Accounts or the Analysis.

The approximations are made in the order set out below (although some or all may be skipped if not required) and thus some approximations may be based on previous approximations.

1. Actual Member Contributions, if they are evaluated as being less than or equal to zero, are set equal to Expected Member Contributions (to cope with no specification of Accumulated Employee Contributions without Interest data field or missing value at Exit).
2. Expected Member Contributions, if they are evaluated as being equal to zero, are set equal to Actual Member Contributions (to cope with no salary at Entry).
3. Actual Company Contributions, if they are evaluated as being less than or equal to zero, are set equal to Actual Member Contributions multiplied by the ratio of the Expected Company Contribution Rate over the Expected Member Contribution Rate (to cope with no specification of Accumulated Employer Contributions without Interest data field or missing value at Exit).

In the common circumstance where both Accumulated Contributions without Interest data fields are not specified or values are missing at Exit, this approximation will result in Actual Company Funded Contributions equal to Expected Company Funded Contributions.

The Expected Contribution Rates (Member and Company) are calculated as:

- the average rate of Expected Contribution over the inter-valuation period (calculated as the sum of Expected Member Contributions divided by the sum of the Expected 1% of Salary based on the projection from the Previous Valuation Date), or (if this is zero)
 - the average rate of Expected Contribution over a future inter-valuation period (as projected from the valuation at the Current Valuation Date or Date of Exit), or (if this is zero)
 - the average rate of Expected Contribution over a future inter-valuation period (as projected from the valuation at the Current Valuation Date or Date of Exit but assuming a future salary level of 1 per annum).
4. Required Company Contributions, if they are evaluated as being equal to zero, are set equal to Actual Company Contributions (to cope with no salary at entry or exit).
 5. Expected Company Contributions, if they are evaluated as being equal to zero, are set equal to Actual Company Contributions (to cope with no salary at entry or exit).
 6. Actual Current Cost Company Contributions are set equal to Actual Company Contributions multiplied by the ratio of the Expected Company Current Cost Contribution Rate over the Expected Company Contribution Rate.

7. Expected Current Cost Company Contributions, if they are evaluated as being equal to zero, are set equal to Actual Current Cost Company Contributions (to cope with no salary at entry).

Typically, these approximations should only be required for new entrants and exits where the salary information is not supplied at entry or exit. The result of these assumptions is that a New Entrant Exit without any salary information will have a reserve at exit calculated as the sum of the Actual member and Company contributions plus Expected Interest on these amounts.

Contributions Profits

Thus, the calculation of the contribution profits for the example members would be as follows (based on the rates of contribution as specified in the Contribution screens):

Starter Ender - Projected Unit Credit (Appendix 2)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Member Conts	2,438	2,536	2,637	7,611
Actual Member Conts	19,076 - 11,043			8,033
Excess Member Conts				-422
Expected Company Conts	4,064	4,226	4,395	12,685
Actual Company Conts	8,033 * 12.5 / 7.5			13,388
Excess Company Conts				-703
Expected Death Current Cost Conts	813	845	879	,537
Actual Death Current Cost Conts	13,388 * 2.5 / 12.5			2,678
Excess Death Current Cost Conts				-141
Expected Ill Health Current Cost Conts	0	0	0	0
Actual Ill Health Current Cost Conts	13,388 * 0.0 / 12.5			0
Excess Ill Health Current Cost Conts				0

New Entrant - Attained Age Normal (Appendix 3)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Member Conts	365	1,521	1,582	3,468
Actual Member Conts	4,157 - 0			4,157
Excess Member Conts				689
Expected Company Conts	609	2,535	2,636	5,780
Actual Company Conts	4,157 * 12.5 / 7.5			6,928
Excess Company Conts				1,148
Expected Death Current Cost Conts	122	507	527	1,156
Actual Death Current Cost Conts	6,928 * 2.5 / 12.5			1,386
Excess Death Current Cost Conts				230
Expected Ill Health Current Cost Conts	0	0	0	0
Actual Ill Health Current Cost Conts	6,928 * 0.0 / 12.5			0
Excess Ill Health Current Cost Conts				0

Starter Exit - Projected Unit Credit (Appendix 4)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Member Conts	5,365	5,580	1,450	12,395
Actual Member Conts	15,755 - 3,236			12,519
Excess Member Conts				124

Expected Company Conts	8,942	9,300	2,416	20,658
Actual Company Conts	12,519 * 12.5 / 7.5			20,865
Excess Company Conts	207			
Expected Death Current Cost Conts	1,788	1,860	483	4132
Actual Death Current Cost Conts	20,865 * 2.5 / 12.5			4,173
Excess Death Current Cost Conts	41			
Expected Ill Health Current Cost Conts	0	0	0	0
Actual Ill Health Current Cost Conts	20,865 * 0.0 / 12.5			0
Excess Ill Health Current Cost Conts	0			

5.1.2 Funding Level Profits

The difference between the rate of Company contribution actually paid and the theoretically required rate of Company contributions represents a Funding Level profit (that is, a surplus is being created if the Company is paying more than is required).

Thus, the calculation of the funding level profit for the example members would be as follows:

Starter Ender - Projected Unit Credit (Appendix 2)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active	1.00	1.00	1.00	-
Expected Company Conts	4,064	4,226	4,395	12,685
Required Company Conts	3,482	3,796	4,137	11,414
Funding Level Profit	582	430	258	1,271

New Entrant - Attained Age Normal (Appendix 3)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active	0.25	1.00	1.00	-
Expected Company Confs	609	2,535	2,636	5,780
Required Company Confs	361	1,589	1,744	3,695
Funding Level Profit	248	946	892	2,085

Note: Contributions are pro-rated in the year of Entry. Due to technical reasons (which is because a valuation of the member is performed prior to entry - when Past Service, in this case, is - 0.75 years!), the Required Company Contributions in the year of Entry are understated and leads to an error in the Reserve build-up.

Starter Exit - Projected Unit Credit (Appendix 4)				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active	1.00	1.00	0.25	-
Expected Company Confs	8,942	9,300	2,416	20,658
Required Company Confs	8,340	9,082	2,470	19,892
Funding Level Profit	602	218	-54	766

Note: Contributions are pro-rated in the year of Exit and are equal to the Expected Contributions due to the valuation method.

5.1.3 Reserves and Salary Increase Strain

The difference between the Actual Reserve at the Current Valuation Date (or Exit) and the Expected Reserve at this date is considered a strain due to salary increases.

The Actual Reserve is calculated as part of the valuation process and the method of calculation depends on the particular valuation method being used:

Projected Unit Credit - Equal to a Retrospective Reserve of the PUC Projected Benefit Obligation

Attained Age Normal - Equal to a Retrospective Reserve of the present value of accrued portion (that is, the portion of each benefit that has been accrued by virtue of completion of membership or payment of contributions in the Scheme) of all Benefits (usually referred to as the Past Service Liability)

If the Actual Reserve is calculated as zero (due to a lack of member information at the Current Valuation Date), the Actual Reserve is set equal to the Expected Reserve at the Current Valuation Date.

The Expected Reserves are projected as part of the valuation process at anniversary of the valuation date at or immediately prior to the latter of Entry or the Previous Valuation Date assuming the member remains in force until the earlier of the Date of Exit or the Current Valuation Date. The calculation of the reserve at that date of valuation is identical to that described above for the Current Reserve.

The process involved in the projection of reserves is set out below for each of the two types of reserve calculation.

Prospective Reserve - The prospective reserve is equal to the present value of the future Total Benefit Liability (occurring after the projected future date) less the present value of the future Member and Company "Funded" Contributions (after the future date). This produces an accurate projection of all benefits and contributions.

Retrospective Reserve - The retrospective reserve is equal to the present value of the projected Past Service Liability (basically equal to the Past Service Liability at the valuation date plus a proportion of the Future Service Liability with appropriate allowance for inflation and discounting). The Future Service Liability is assumed to accrue uniformly between the date of the valuation and date of the benefit emerging and thus the pro-ration is based on the service completed since the valuation date compared to the potential service at the assumed date of exit (the same as pro-ration for the Projected Unit Credit Normal Cost).

This method of pro-ration will accurately project liabilities related to service (or pro-rated in the Past Service Liability by service), but is an approximation to other benefits such as:

- "greater of" benefits such as those subject to the contributions underpin, and
- benefits based on a return of contributions.

For all methods using a Retrospective approach, the reserve is set equal to zero at Entry for an inter-valuation new entrant.

For members who attain an age beyond the assumed retirement age, the Expected Reserve is projected by rolling up the Reserve at the Retirement Age with interest at the valuation rate.

When the Reserve projected from the Previous Valuation Date is zero (for example, when salary at Entry is not specified), the Expected Reserve at the Current Valuation Date is assumed to be the sum of Actual Member Contributions and Actual Company "Funded" Contributions plus Interest at the valuation rate.

Thus, the calculation of the salary increase strain for the example members would be as follows:

	Starter Ender - Projected Unit Credit	New Entrant - Attained Age Normal	Starter Exit - Projected Unit Credit
Current Actual Reserve	122,457	8,761	51,962
Projected Expected Reserve	109,766	7,739	45,233
Salary Increase Strain	12,691	1,022	6,729

5.1.4 Reserves and Salary Increase Strain

The profit emerging from members exiting the Scheme is calculated as the difference between the Actual Release of Reserves for members actually leaving the Scheme over the inter-valuation period and the Expected Release of Reserves based on the valuation assumptions.

The release of Expected Reserves takes account only of those benefits that have been "funded" (as no Reserve is held for those benefits paid for on a Current Cost basis). Thus the amount of the Expected Current Cost Company contributions are also released, offsetting the strain from allowing for "insured" benefits paid from the Scheme.

Actual Release of Reserve

The Actual Release of Reserve (for exiting members only) is calculated as the difference between the Actual Reserve at the date of exit and the amount of the immediate Cash Benefit (if any) paid to the exiting member including any "insured" cash benefit, but excluding the value of any ("insured" or "funded") pension benefits paid.

For inter-valuation Exits, the immediate Cash Benefit paid at Exit is read from the data field in the member data record which is specified as Lump Sum Benefit on Exit (BOE) .

The Actual Release will be allocated to one of the four causes of decrement

- Retirement
- Death in Service
- Ill-Health
- Withdrawal

According to the Mode of Exit for the member matching one of the modes of exit specified (in the Analysis of Surplus Parameters screen) that relate to the particular cause of exit (for example, Retirement may include "E" for early, "N" for Normal and "L" for Late Retirement).

If the Mode of Exit does not match one of those specified (or is blank), it will be allocated to the "Unspecified" cause of exit (for which there is no Expected Release of Reserve). This may be used in the situation where members have been retrenched by the Employer - a situation not "expected" on the valuation basis.

The results of the Analysis (in terms of Actual Releases on the 4 causes of exit) will then be broken down by each of the modes of exit specified and then grouped together to give the overall release for that cause of exit.

Note that the value of any pension benefits will be revealed as a surplus but this surplus will be offset by a new entrant strain emerging in the pensioner of deferred member Analysis of Surplus.

As only the example Starter Exit member did exit, the Actual Release upon Exit calculation for him would be as follows:

	Starter Exit - Projected Unit Credit
Actual Reserve at Exit	51,962
Cash Benefit at Exit	60,000
Actual Reserve Release at Exit	-8,038

Note: Depending on the marital status of the deceased member a spouse's pension is payable and the value of this benefit (evaluated in the Pensioners Analysis of Surplus) will be an additional strain in respect of this exit. The Type of Pension code will provide the link with the Exit code from the Actives analysis.

Expected Release of Reserve

The release upon exit for each of the assumed exit decrements (all released at the assumed point of exit, that is, mid-year except for normal retirement which is assumed to take place at the start of the year) is calculated as:

the projected reserve (at the end of year of assumed exit discounted back to the middle of the year, except normal retirement where start year (that is, point of exit) reserve is utilised)

less "foregone" contributions, that is, the expected non-receipt of half of the Expected Contributions (Member and Required Company) receivable for the year anticipated by the exit event (zero for normal retirement as exit occurs at start of year)

less the expected "funded" benefit payment.

These calculations are carried out at the latter of the anniversary of the valuation date at or prior to Entry or the Previous Valuation Date and assume the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

The expected release is calculated for each of the four causes of decrement:

- Withdrawal
- Death
- Ill-Health and
- Retirement.

Thus, the calculations for the expected release upon death for the example members would be as follows:

Starter Ender - Projected Unit Credit				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active (t)	1.00	1.00	1.00	-
Expected Reserve - End Year	83,678	96,058	109,766	-
Probability of Exit – Qdeath	0.00178	0.00196	0.00219	-
Expected Member Contributions	2,438	2,536	2,637	7,611
Required Company Contributions	3,482	3,796	4,137	11,414
Total Benefit – Death	94,329	103,238	112,374	-
Discounted Reserve $\text{Reserve}_1 / 1.07^{(0.5 \times t)}$	80,895	92,863	106,115	-
Reserve Release - Disc. Reserve x QDeath x t	144	182	232	558
Foregone Contributions $0.5 \times (\text{MC} + \text{CC}) \times \text{QDeath} \times t$	5	6	7	18
Benefit Paid Total Benefit x QDeath x t	168	202	246	616
Expected Release	-29	-27	-21	-76

New Entrant - Attained Age Normal				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active (t)	0.25	1.00	1.00	-
Expected Reserve - End Year	752	4,020	7,739	-
Probability of Exit – Qdeath	0.00073	0.00078	0.00084	-
Expected Member Contributions	365	1,521	1,582	3,468
Required Company Contributions	361	1,589	1,744	3,695

Total Benefit – Death	0	3,891	9,296	-
Discounted Reserve $\text{Reserve}_1 / 1.07^{(0.5 \times t)}$	727	3,886	7,482	-
Reserve Release - Disc. Reserve x QDeath x t	0	3	6	9
Foregone Contributions $0.5 \times (\text{MC} + \text{CC}) \times \text{QDeath} \times t$	0	1	1	2
Benefit Paid Total Benefit x QDeath x t	0	3	8	11
Expected Release	0	-1	-3	-4

Starter Exit - Projected Unit Credit				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active (t)	1.00	1.00	0.25	-
Expected Reserve - End Year	23,652	40,470	58,625	-
Probability of Exit – Qdeath	0.00233	0.00259	0.00289	-
Expected Member Contributions	5,365	5,580	1,450	2,395
Required Company Contributions	8,340	9,082	2,470	19,892
Total Benefit – Death	17,490	33,037	49,059	-
Discounted Reserve $\text{Reserve}_1 / 1.07^{(0.5 \times t)}$	22,865	39,124	58,131	-
Reserve Release - Disc. Reserve x QDeath x t	53	101	42	196
Foregone Contributions $0.5 \times (\text{MC} + \text{CC}) \times \text{QDeath} \times t$	16	19	1	36

Benefit Paid Total Benefit x QDeath x t	41	86	35	162
Expected Release	-3	-3	6	-1

5.1.5 Release of Current Cost Contributions

As discussed above, for the Death and Ill-Health decrements (when the funding method adopted for some or all of the benefit is current cost), the amount of the Expected Current Cost Company contributions are released. As no Reserve is held for these "insured" benefits, the Release of these contributions offsets the payment of Actual "Insured" Benefits (either as a Cash Benefit or via a pension paid from the Scheme).

	Starter Ender - Projected Unit Credit	New Entrant - Attained Age Normal	Starter Exit - Projected Unit Credit
Actual Reserve Release	0	0	-8,038
Expected Reserve Release	-76	-4	-1
Expected Current Cost Contributions	2,537	1,156	4,132
Exit Profit	2,613	1,160	-3,905

5.1.6 Expected Interest

Interest is calculated at the rate expected on the valuation assumptions on all items that contribute to the build-up of the reserve.

Thus, the Expected Interest is calculated as follows:

the Reserve at the start of the year times the valuation rate of interest in that year
plus the sum of the Expected Releases of Reserves for each of the four causes of exit plus the Required Company and Member Contributions for the year times half a year's interest at the valuation rate (that is, the square root of the valuation rate).

When the Expected Interest projected from the Previous Valuation Date is zero (for example, when salary at Entry is not specified), the Expected Interest is calculated as the Expected Interest that would have been payable on the build-up on the sum of Actual Member Contributions and Actual Company Funded Contributions at the valuation interest rate.

Thus, the calculations for the example members would be as follows:

Starter Ender - Projected Unit Credit				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active (t)	1.00	1.00	1.00	-
Expected Reserve - Start Year	72,509	83,678	96,058	109,766
Expected Member Contributions - Mid Year	2,438	2,536	2,637	7,611
Required Company Contributions - Mid Year	3,482	3,796	4,137	11,414
Expected Release (All Causes of Exit) - Mid Year	-29	-27	-21	-77
Expected Interest - Start Year = Reserve * 0.07 * t	5,076	5,857	6,724	17,657
Expected Interest -Mid Year =(MC+CC+Rel)*(1.07^(0.5*t))-1	203	217	232	652
Total Expected Interest	5,279	6,074	6,956	18,309
Reserve Build-Up =Res ₀ +MC+CC+Rel+Int	83,678	96,508	109,766	
Error In Reserve Build-Up	0	0	0	0

New Entrant - Attained Age Normal				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active (t)	0.25	1.00	1.00	-
Expected Reserve - Start Year	0	752	4,020	7,739
Expected Member Contributions - Mid Year	365	1,521	1,582	3,468
Required Company Contributions - Mid Year	361	1,589	1,744	3,695
Expected Release (All Causes of Exit) - Mid Year	0	-1	-3	-4
Expected Interest - Start Year = Reserve * 0.07 * t	0	53	281	334
Expected Interest -Mid Year = (MC+CC+Rel)*(1.07^(0.5*t))-1	6	107	114	227
Total Expected Interest	6	160	395	561
Reserve Build-Up = Res ₀ +MC+CC+Rel+Int	732	4,020	7,739	
Error In Reserve Build-Up	-20	0	0	-20

Note: As a valuation of the member is performed prior to entry - when Past Service, in this case, is -0.75 years!), the Required Company Contributions in the year of Entry are understated and leads to an error in the Reserve build-up.

Starter Exit - Projected Unit Credit				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Proportion Active (t)	1.00	1.00	0.25	-
Expected Reserve - Start Year	8,858	23,652	40,470	45,233

Expected Member Contributions - Mid Year	5,365	5,580	1,450	12,395
Required Company Contributions - Mid Year	8,340	9,082	2,470	19,892
Expected Release (All Causes of Exit) - Mid Year	-3	-3	6	-1
Expected Interest - Start Year = Reserve * 0.07 * t	620	1,656	708	2,984
Expected Interest -Mid Year $= (MC + CC + Rel) * (1.07^{(0.5 * t)}) - 1$	471	504	33	1,008
Total Expected Interest	1,091	2,160	741	3,992
Reserve Build-Up $= Res_0 + MC + CC + Rel + Int$	23,652	40,470	45,137	
Error in Reserve Build-Up	0	0	-96	-96

Note: The error in this example is due to the use of linear interpolation for the Expected Reserve value at Exit (and the Reserve Build-Up is probably a better representation of the "true" Expected Reserve at Exit).

5.1.7 Approximations in the Analysis of Surplus System

The following is a list of approximations made by the Analysis of Surplus system:

- for the projection of Retrospective Reserves (as used in AAN and PUC) benefits accruing in the future are assumed to be uniformly accrued to the date of payment,
- calculations made using any time-related elements in the valuation basis will be carried out on the assumption that the time-related factors commence at both valuation dates at which the calculations are being made (which, of course, should not be the case if they vary with time),
- valuation periods of a non-integral number of years are catered for by carrying out calculations for a valuation period of the next highest number of years and interpolating the figures at the Previous Valuation Date,

- iv. calculations for inter-valuation new entrants are carried out at the anniversary of the valuation date prior to entry (that is, a valuation period of the number of years of membership rounded up is assumed) and the figures at Entry are interpolated (thus all salaries figures specified are assumed to be those applying at this prior date),
- v. if a zero reserve is calculated for Exits at the Date of Exit (that is, salaries and contributions at Exit were not specified), the reserve and actual contribution amounts will be assumed equal to the "expected" values (projected from the Previous Valuation Date or Date of Entry). Thus, the Salary Profit will be zero.
- vi. if the Expected Member Contributions are equal to zero (for example, when salary at Entry is not specified) they are set equal to the amount of Actual Member Contributions.

5.1.8 Circumstances not automatically allowed for in the Analysis of Surplus System

The following is a list of circumstances which the system will not cope with automatically along with the suggested solution to derive the required numbers:

- i. change in member information such as date of birth or date of entry,
Solution: Value member on both old and new information and carry forward the resulting surplus.
- ii. change in member's benefit category,
Solution: Value member in both old and new category and carry forward the resulting surplus.
- iii. change in valuation basis,
Solution: Value members on both the old and new valuation basis (either at the current or previous valuation date) and carry forward the resulting surplus.
- iv. time-related items in the valuation basis (such as short-term interest and inflation rates, time related weights on withdrawal),
Solution: Treat as for a change in Valuation basis.

5.2 Pensioners Results

The specific calculations for Pensioner Members are set out below. Obviously many of the values are based on numbers generated from the valuation, which have been documented elsewhere, and reference will be made to these values without explanation.

The specification will be illustrated by sample calculations based on the following members (whose results are displayed in Appendix 6 to this note):

- a Start Ender married pensioner with 1 year remaining in the Guarantee Period,
- a New Entrant single pensioner, and
- a Starter Exit married pensioner.

All three members are males born on at 31 December 1940 and the other relevant pension payment details are:

- a 50% Reversionary Pension is also payable (if applicable);
- 5% p.a. increases are payable on the pension.

5.2.1 "Contributions" - Pension Payments

The amounts of Expected and Actual pension payments are evaluated.

Expected Pension Payments

"Expected" Pension Payments are based on the expected pension payments to the pensioner, as projected in the valuation of the pensioner at the later of the Date Pension Commenced or the Previous Valuation Date assuming the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

An approximation may be applied if Expected Pension Payments are calculated as zero, for example when Pension at Entry is not specified. These approximations are discussed in more detail below.

Thus, the calculations for the example pensioners would be as follows:

Start Ender				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Pension	1,025	1,076	1,130	-
Proportion Active	1.00	1.00	1.00	-
Expected Pension Payment	1,025	1,076	1,130	3,231

New Entrant				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Pension	1,100	1,100	1,100	-
Proportion Active	0.25	1.00	1.00	-
Expected Pension Payment	275	1,100	1,100	2,475

Note: Pension Payments are pro-rated in the year of Entry.

Starter Exit				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	Total
Expected Pension	1,025	1,076	1,130	-
Proportion Active	1.00	1.00	0.25	-
Expected Pension Payment	1,025	1,076	283	2,384

Note: Pension Payments are pro-rated in the year of Exit.

Actual Pension Payments

The Actual Pension Payments are obtained from the data item, Total Pension Paid. Note that this is the sum of all Pension amounts paid to the pensioner over the inter-valuation period.

An approximation may be applied if Total Pension Paid is evaluated as zero, for example, when the Total Pension Paid field is not specified. These approximations are discussed in more detail below.

Note that it is not mandatory that the Total Pension Paid data field be specified as the total Scheme amount of Actual Pension paid can be blended with the consolidated Analysis of Surplus results (replacing the approximate figure estimated by the system).

Pension Payments - Approximations

The following sets out the approximations made by system in respect of the calculation of Expected and Actual Pension Payments. Note that these calculations are generally designed to overcome insufficient member data, either on an overall Scheme level (for example, the Total Pension Paid data field is not specified) or for specific members (such as missing data for New Entrants at Entry or for Exits at Date of Exit).

The approximation calculated may not be required as the corresponding amount may be available in the Scheme accounts or a more appropriate approximation may be possible based on other amounts in the Accounts or the Analysis.

The approximations are made in the order set out below (although some or all may be skipped if not required).

1. Expected Pension Payments, if they are evaluated as being equal to zero, are set equal to Actual Pension Payments (to cope with no pension specified at Entry).
2. Actual Pension Payments, if they are evaluated as being equal to zero, are set equal to Expected Pension Payments (to cope with no specification of the Total Pension Paid data field).

Typically, these approximations should only be required for new entrants and exits where the pension information is not supplied at entry or exit.

Pension Payments Profits

Thus, the calculation of the pension payments profits for the example members would be as follows:

	Starter Ender	New Entrant	Starter Exit
Expected Pension Paid	3,230	2,475	2,380
Actual Pension Paid	3,250	2,500	2,500
Pension Payments Profit	-20	-25	-120

5.2.2 Reserves & Pension Increase Profits

The difference between the Actual Reserve at the Current Valuation Date (or Exit) and the Expected Reserve at this date is considered a strain due to pension increases.

The Actual Reserve is calculated as part of the valuation process. If the Actual Reserve is calculated as zero (due to a lack of pensioner information at the Current Valuation Date), the Actual Reserve is set equal to the Expected Reserve at the Current Valuation Date.

The Expected Reserves are projected as part of the valuation process at anniversary of the valuation date at or immediately prior to the latter of Entry or the Previous Valuation Date assuming the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

When the Reserve projected from the Previous Valuation Date is zero (for example, when pension at Entry is not specified), the Expected Reserve at the Current Valuation Date is assumed equal to the Actual Reserve at that date.

Thus, the calculation of the pension increase profit for the example members would be as follows:

	Starter Ender	New Entrant	Starter Exit
Projected Expected Reserve	14,331	10,750	14,226
Current Actual Reserve	14,484	10,750	14,226
Pension Increase Profit	-153	0	0

5.2.3 New Entrant Strain

The Actual Reserve at the Date of Entry for New Entrants is considered a strain. This strain is required to offset a corresponding surplus that will have emerged from either the Active members Analysis of Surplus or the Deferred members Analysis of Surplus.

This Actual Reserve is calculated as part of the valuation process at anniversary of the valuation date at or immediately prior to the Date of Entry.

When the Actual Reserve calculated at the Previous Valuation Date is zero (for example, when pension at Entry is not specified), the Reserve is assumed equal to the Actual Reserve at the Current Valuation Date plus Actual Pension Payments less Expected Interest Earned.

Thus, the calculation of the new entrant strain for the example members would be as follows:

	Starter Ender	New Entrant	Starter Exit
Actual Reserve at Entry	n/a	11,056	n/a
New Entrant Strain	0	11,056	0

5.2.4 Release of Reserve upon Exit

The profit emerging from pensioners exiting the Scheme is calculated as the difference between the Actual Release of Reserves for pensioners actually leaving the Scheme over the inter-valuation period and the Expected Release of Reserves based on the valuation assumptions.

Actual Release of Reserve

The Actual Release of Reserve (for exiting pensioners only) is calculated as the difference between the Actual Reserve at the date of exit and the amount of the immediate Cash Benefit (if any) paid to the exiting pensioner.

For inter-valuation Exits, the immediate Cash Benefit paid at Exit is read from the Benefit at Exit data field (BOT) in the pensioner data record.

The Actual Release will be allocated to the Death Release if the Mode of Exit for the pensioner matches the mode of exit specified on the AOS tab.

If the Mode of Exit does not match one of those one specified (or is blank), it will be allocated to the "Unspecified" cause of exit (for which there is no Expected Release of Reserve). This may be used in the situation where pensioners have commuted their pension - a situation not "expected" on the valuation basis.

As only the example Starter Exit member did exit, the Actual Release upon Exit calculation for him would be as follows:

	Starter Exit
Actual Reserve at Exit	14,226
Cash Benefit at Exit	5,500
Actual Reserve Release at Exit	8,726

A release upon assumed exit (released at the assumed point of exit, that is, mid-year) is calculated for each of the following:

- the reserve in respect of the single life pension
- the reserve in respect of the reversionary pension

These calculations are carried out at the latter of the anniversary of the valuation date at or prior to Entry or the Previous Valuation Date and assume the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

5.2.5 Exit Profit

The resultant profit revealed from Exits is the difference between Actual Release on Exit and the Expected Release for that cause of Exit.

Thus, the calculation of the Exit Profit in respect of deaths for the example members would be as follows:

	Starter Ender	New Entrant	Starter Exit
Actual Reserve Release	0	0	9,181
Expected Reserve Release	817	0	597
Exit Profit	-817	0	8,584

5.2.6 Expected Interest

Interest is calculated at the rate expected on the valuation assumptions on all items that contribute to the build-up of the reserve.

Thus, the Expected Interest is calculated as follows:

the Reserve at the start of the year times the valuation rate of interest in that year
plus the sum of the Expected Releases of Reserves less the Expected Pension Payments for the year times half a year's interest at the valuation rate (that is, the square root of the valuation rate).

5.2.7 Approximations in the Analysis of Surplus System

The following is a list of approximations made by the Pensioner Analysis of Surplus system:

- calculations made using any time-related elements in the valuation basis will be carried out on the assumption that the time-related factors commence at both valuation dates at which the calculations are being made (which, of course, should not be the case if they vary with time),

- valuation periods of a non-integral number of years are catered for by carrying out calculations for a valuation period of the next highest number of years and interpolating the figures at the Previous Valuation Date,
- calculations for inter-valuation new entrants are carried out at the anniversary of the valuation date prior to entry (that is, a valuation period of the number of years of membership rounded up is assumed) and the figures at Entry are interpolated (thus all salaries figures specified are assumed to be those applying at this prior date),
- if a zero reserve is calculated for Exits at the Date of Exit (that is, pensions at Exit were not specified), the reserve and actual pension amounts will be assumed equal to the "expected" values (projected from the Previous Valuation Date or Date of Entry). Thus, the Pension Increase Profit will be zero!

5.2.8 Circumstances not automatically allowed for in Analysis of Surplus System

The following is a list of circumstances which the system will not cope with automatically along with the suggested solution to derive the required numbers:

- change in member information such as date of birth or date of entry,
Solution: Value member on both old and new information and carry forward the resulting surplus.
- change in member's benefit category,
Solution: Value member in both old and new category and carry forward the resulting surplus.
- change in valuation basis,
Solution: Value members on both the old and new valuation basis (either at the current or previous valuation date) and carry forward the resulting surplus.
- time-related items in the valuation basis (such as short-term interest and inflation rates, time related weights on withdrawal),
Solution: Treat as for a change in Valuation basis.

5.3 Deferreds Results

The specific calculations for Deferred Members are set out below. Obviously many of the values are based on numbers generated from the valuation, which have been documented elsewhere, and reference will be made to these values without explanation.

The specification will be illustrated by sample calculations based on the following members (whose results are displayed in Appendix 7 to this note):

- Starter Ender Member
- New Entrant Ender
- Starter Exit Member

5.3.1 Reserve & Pension Increases Profits

The difference between the Actual Reserve at the Current Valuation Date (or Exit) and the Expected Reserve at this date is considered a strain due to pension increases.

The Actual Reserve is calculated as part of the valuation process. If the Actual Reserve is calculated as zero (due to a lack of deferred information at the Current Valuation Date), the Actual Reserve is set equal to the Expected Reserve at the Current Valuation Date.

The Expected Reserves are projected as part of the valuation process at anniversary of the valuation date at or immediately prior to the latter of Entry or the Previous Valuation Date assuming the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

When the Reserve projected from the Previous Valuation Date is zero (for example, when pension at Entry is not specified), the Expected Reserve at the Current Valuation Date is assumed equal to the Actual Reserve at that date.

5.3.2 New Entrant Strain

The Actual Reserve at the Date of Entry for New Entrants is considered a strain. This strain is required to offset a corresponding surplus that will have emerged from the Active members Analysis of Surplus.

This Actual Reserve is calculated as part of the valuation process at anniversary of the valuation date at or immediately prior to the Date of Entry.

When the Actual Reserve calculated at the Previous Valuation Date is zero (for example, when pension at Entry is not specified), the Reserve is assumed equal to the Actual Reserve at the Current Valuation Date plus Actual Pension Payments less Expected Interest Earned.

5.3.3 Release of Reserve upon Exit

The profit emerging from members exiting the Scheme is calculated as the difference between the Actual Release of Reserves for members actually leaving the Scheme over the inter-valuation period and the Expected Release of Reserves based on the valuation assumptions.

Actual Release of Reserve

The Actual Release of Reserve (for exiting pensioners only) is calculated as the difference between the Actual Reserve at the date of exit and the amount of the immediate Cash Benefit (if any) paid to the exiting member.

For inter-valuation Exits, the immediate Cash Benefit paid at Exit is read from the data field in the member data record which is specified as Lump Sum Benefit on Exit (BOE).

The Actual Release will be allocated to one of the four causes of decrement

- Retirement
- Death Before Retirement

According to the Mode of Exit for the member matching one of the modes of exit specified (in the Analysis of Surplus Parameters screen) that relate to the particular cause of exit (for example, Retirement may include "E" for early, "N" for Normal and "L" for Late Retirement).

If the Mode of Exit does not match one of those specified (or is blank), it will be allocated to the "Unspecified" cause of exit (for which there is no Expected Release of Reserve).

The results of the Analysis (in terms of Actual Releases on the 2 causes of exit) will then be broken down by each of the modes of exit specified and then grouped together to give the overall release for that cause of exit.

Note that the value of any pension benefits will be revealed as a surplus but this surplus will be offset by a new entrant strain emerging in the pensioner member Analysis of Surplus.

Expected Release of Reserve

The release upon exit for each of the assumed exit decrements is released at the assumed point of exit i.e. mid-year except for normal retirement which is assumed to take place at the start of the year.

The calculations are carried out at the latter of the anniversary of the valuation date at or prior to Entry or the Previous Valuation Date and assume the member remains in force until the earlier of the Date of Exit or the Current Valuation Date.

The expected release is calculated for each of the four causes of decrement:

- Retirement
- Death

5.3.4 Exit Profit

The resultant profit revealed from Exits is the difference between Actual Release on Exit and the Expected Release for that cause of Exit.

5.3.5 Expected Interest

Interest is calculated at the rate expected on the valuation assumptions on all items that contribute to the build-up of the reserve.

Thus, the Expected Interest is calculated as follows:

the Reserve at the start of the year times the valuation rate of interest in that year
plus the sum of the Expected Releases of Reserves less the Expected Pension Payments for the year times half a year's interest at the valuation rate (that is, the square root of the valuation rate).k

5.3.6 Approximations in the Analysis of Surplus System

The following is a list of approximations made by the Deferred Analysis of Surplus system:

- calculations made using any time-related elements in the valuation basis will be carried out on the assumption that the time-related factors commence at both valuation dates at which the calculations are being made (which, of course, should not be the case if they vary with time),
- valuation periods of a non-integral number of years are catered for by carrying out calculations for a valuation period of the next highest number of years and interpolating the figures at the Previous Valuation Date,
- calculations for inter-valuation new entrants are carried out at the anniversary of the valuation date prior to entry (that is, a valuation period of the number of years of membership rounded up is assumed) and the figures at Entry are interpolated (thus all salaries figures specified are assumed to be those applying at this prior date),
- if a zero reserve is calculated for Exits at the Date of Exit (that is, pensions at Exit were not specified), the reserve and actual pension amounts will be assumed equal to the "expected" values (projected from the Previous Valuation Date or Date of Entry).

5.3.7 Circumstances not automatically allowed for in Analysis of Surplus System

The following is a list of circumstances which the system will not cope with automatically along with the suggested solution to derive the required numbers:

- change in member information such as date of birth or date of entry,

Solution: Value member on both old and new information and carry forward the resulting surplus.

- change in member's benefit category,

Solution: Value member in both old and new category and carry forward the resulting surplus.

- change in valuation basis,

Solution: Value members on both the old and new valuation basis (either at the current or previous valuation date) and carry forward the resulting surplus.

- time-related items in the valuation basis (such as short-term interest and inflation rates, time related weights on withdrawal),

Solution: Treat as for a change in Valuation basis.

6 APPENDICES

6.1 Appendix 1

Example of an active data merge file ready for Data Build.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S
	MEMNO	NAME	SEX	CAT	DOB	DJS	DJF	SAL	PSAL	GMP0	GMPE0	MOE	DOE	#GMP0	#GMPE0			
1	C	C	C	C	dd/mm/yyyy	dd/mm/yyyy	dd/mm/yyyy	N	N	N	N	C	dd/mm/yyyy	N	N			
2	1	Member 1	M	A	01/01/1955	01/01/1980	01/01/1980	15000	10000	0	0			0	0	M		
3	2	Member 2	M	A	01/01/1955	01/01/1975	01/01/1980	15000	10000	0	0			0	0	M		
4	3	Member 3	M	A	01/01/1955	01/01/1980	01/01/1980	15000	10000	0	0	R	01/01/2008	0	0	M		
5	4	Member 4	M	A	01/01/1955	01/01/1975	01/01/1980	15000	10000	0	0			0	0	M		
6	5	Member 5	M	A	01/01/1955	01/01/1970	01/01/1980	15000	10000	0	0			0	0	M		
7	6	Member 6	M	A	01/01/1955	01/01/1965	01/01/1980	15000	10000	0	0	I	01/01/2008	0	0	M		
8	7	Member 7	M	A	01/01/1955	01/01/1960	01/01/1980	15000	10000	0	0	D	01/01/2008	0	0	M		
9	8	Member 8	M	A	01/01/1955	01/01/1955	01/01/1980	15000	10000	0	0	W	01/01/2008	0	0	M		
10	9	Member 9	M	A	01/01/1955	01/01/2007	01/01/2007	15000	10000	0	0					M		
11	9	Member 9	M	A	01/01/1955	01/01/2007	01/01/2007	15000	10000	0	0	D	01/01/2008			M		

Active data from current
valuation

Active data from previous
valuation.

The names of the variables
are prefixed by # as they are
from the previous valuation.

6.2 Appendix 2

TOTAL INDIVIDUAL MEMBER LISTING														
Client: AOS 21 February 2012 9:27 AM Member Details: Name: Starter En Sex: M DoB:01/12/1963 DJC:01/05/1996 DJS:01/05/1996 GMP's - Pre-88: æ 0 Post-88: æ 0														
AGE	TPX	FINAL		FUTURE STERLING VALUES OF BENS ON 1 Year Normal Cost of Bens								CONTS	ACCRUED	PUC
		SALARY	AVERAGE	(AC)j	RET.	DEATH	ILL H.	LEAVING	RET.	DEATH	ILL H.	LEAVE	IN DEF	BENEFIT
45	1.00000	32,508	32,508	0	0	94,329	0	0	0	6	0	0	0	156
46	0.99822	33,808	33,808	2,438	0	103,238	0	0	0	13	0	0	0	164
47	0.99626	35,161	35,161	4,974	0	112,374	0	0	0	14	0	0	0	173
48	0.99408	36,567	36,567	7,611	0	121,739	0	0	0	14	0	0	0	183
49	0.99166	38,030	38,030	10,353	0	131,292	0	0	0	15	0	0	0	193
50	0.98895	39,551	39,551	13,206	0	141,055	0	0	0	16	0	0	0	205
51	0.98593	41,133	41,133	16,172	0	151,003	0	0	0	17	0	0	0	217
52	0.98255	42,778	42,778	19,257	0	161,135	0	0	0	18	0	0	0	231
53	0.97877	44,489	44,489	22,465	0	171,401	0	0	0	19	0	0	0	244
54	0.97454	46,269	46,269	25,802	0	181,816	0	0	0	20	0	0	0	258
55	0.96982	48,120	48,120	29,272	0	192,350	0	0	0	21	0	0	0	271
56	0.96458	50,045	50,045	32,881	0	202,994	0	0	0	22	0	0	0	284
57	0.95876	52,046	52,046	36,634	0	213,688	0	0	0	23	0	0	0	297
58	0.95234	54,128	54,128	40,538	0	224,440	0	0	0	23	0	0	0	297
59	0.94552	56,293	56,293	44,598	0	235,212	0	0	0	23	0	0	0	296
60	0.93833	56,293	56,293	48,820	442,057	0	0	5,450	0	0	0	0	0	69,041
TOTALS					(SUM=	5,718)		5,450	267	0	0	0	72,509	
Present Value of a Contribution of 1% of Salary														3,810

INDIVIDUAL MEMBER ANALYSIS OF SURPLUS LISTING				
Client: AOS 21 February 2012 9:27 AM Member Details: Name: Starter En Sex: M DoB:01/12/1963 DJC:01/05/1996 DJS:01/05/1996 GMP's - Pre-88: æ 0 Post-88: æ 0				
Year Commencing	31/12/2008	31/12/2009	31/12/2010	31/12/2011
Expected Reserves - Valuation Anniversaries	72,509	83,678	96,058	109,766
Expected Interest - Reserve at Previous Valn	5,076	5,431	5,811	6,318
Expected Interest - Expected Reserve at Exit	0	0	0	0
Actual Reserve - Current Valuation/Exit	0	0	0	122,457
Expected Interest - Actual Reserve at Exit	0	0	0	0
Benefit Paid - Exit	0	0	0	0
Expected Interest - Benefit at Exit	0	0	0	0
Probability of Survival	1.00000	0.99822	0.99626	0.99408
Probability of Retirement	0.00000	0.00000	0.00000	0.00000
Probability of Death in Service	0.00178	0.00196	0.00219	0.00000
Probability of Ill-Health Retirement	0.00000	0.00000	0.00000	0.00000
Probability of Leaving Service	0.00000	0.00000	0.00000	0.00000
Expected Total Retirement Benefit Value	0	0	0	0
Expected Total Death Benefit Value	94,329	103,238	112,374	0
Expected Total Ill-Health Benefit Value	0	0	0	0
Expected Total Leavers Benefit Value	0	0	0	0
Expected Releases - Normal Retirement	0	0	0	0
Expected Releases - Early Retirement	0	0	0	0
Expected Releases - Death in Service	-29	-27	-21	-77
Expected Releases - Ill-Health	0	0	0	0
Expected Releases - Leaving Service	0	0	0	0
Expected Interest - Normal Ret. Release	0	0	0	0
Expected Interest - Early Ret. Release	0	0	0	0
Expected Interest - Death Release	-1	-3	-5	-9
Expected Interest - Ill-Health Release	0	0	0	0
Expected Interest - Leaving Release	0	0	0	0
Expected Salary - Member Contributions	32,508	33,808	35,161	36,567
Expected Salary - Company Contributions	32,508	33,808	35,161	36,567
Required Contribution - Company Funded	3,482	3,796	4,137	11,414
Expected Contribution - Member	2,438	2,536	2,637	7,611
Expected Contribution - Company Funded	4,064	4,226	4,395	12,685
Expected Contribution - Insured Death	813	845	879	2,537
Expected Contribution - Insured Ill-Health	0	0	0	0
Expected Interest - Required Company Cont	120	383	687	1,189
Expected Interest - Expected Member Cont	84	264	463	811
Expected Interest - Expected Company Cont	140	440	772	1,352
Expected Interest - Expected Insured Death	28	88	154	270
Expected Interest - Expected Ins. Ill-Health	0	0	0	0
Actual Salary - Member Contributions	0	0	0	40,800
Actual Salary - Company Contributions	0	0	0	40,800

Year Commencing	31/12/2008	31/12/2009	31/12/2010	31/12/2011
Actual Contribution - Member	11,043	0	0	8,033
Actual Contribution - Company Funded	0	0	0	13,388
Actual Contribution - Insured Death	0	0	0	2,678
Actual Contribution - Insured Ill-Health	0	0	0	0
Expected Interest - Actual Member Cont	0	0	0	856
Expected Interest - Actual Company Cont	0	0	0	1,426
Expected Interest - Actual Insured Death	0	0	0	285
Expected Interest - Actual Ins. Ill-Health	0	0	0	0
Expected 1% of Salary	325	338	352	1,015
Average Contribution Rate - Member	7.500%			
Average Contribution Rate - Company	12.500%			

6.3 Appendix 3

		Page 5		Claybrook Computing 8.50				Valuation Date 31 December 2011					
Client: AOS		TOTAL INDIVIDUAL MEMBER LISTING											
21 February 2012 9:45 AM													
Member Details:		Name: New Entran	Sex: M	DoB:01/05/1972	DJC:01/10/2009	DJS:01/10/2009	GMP's -	Pre-88: æ	0	Post-88: æ	0		

Page 11		Claybrook Computing 8.50		Valuation Date 31 December 2011	
Client: AOS		INDIVIDUAL MEMBER ANALYSIS OF SURPLUS LISTING			
21 February 2012 9:45 AM					
Member Details: Name: New Entran Sex: M DoB:01/05/1972 DJC:01/10/2009 DJS:01/10/2009 GMP's - Pre-88: æ 0 Post-88: æ					
Year Commencing	31/12/2008	31/12/2009	31/12/2010	31/12/2011	
Expected Reserves - Valuation Anniversaries	0	752	4,020	7,739	
Expected Interest - Reserve at Previous Valn	0	0	0	0	
Expected Interest - Expected Reserve at Exit	0	0	0	0	
Actual Reserve - Current Valuation/Exit	0	0	0	8,761	
Expected Interest - Actual Reserve at Exit	0	0	0	0	
Benefit Paid - Exit	0	0	0	0	
Expected Interest - Benefit at Exit	0	0	0	0	
Probability of Survival	1.00000	0.99927	0.99849	0.99765	
Probability of Retirement	0.00000	0.00000	0.00000	0.00000	
Probability of Death in Service	0.00073	0.00078	0.00084	0.00000	
Probability of Ill-Health Retirement	0.00000	0.00000	0.00000	0.00000	
Probability of Leaving Service	0.00000	0.00000	0.00000	0.00000	
Expected Total Retirement Benefit Value	0	0	0	0	
Expected Total Death Benefit Value	0	3,891	9,296	0	
Expected Total Ill-Health Benefit Value	0	0	0	0	
Expected Total Leavers Benefit Value	0	0	0	0	
Expected Releases - Normal Retirement	0	0	0	0	
Expected Releases - Early Retirement	0	0	0	0	
Expected Releases - Death in Service	0	-1	-3	-4	
Expected Releases - Ill-Health	0	0	0	0	
Expected Releases - Leaving Service	0	0	0	0	
Expected Interest - Normal Ret. Release	0	0	0	0	
Expected Interest - Early Ret. Release	0	0	0	0	
Expected Interest - Death Release	0	0	0	0	
Expected Interest - Ill-Health Release	0	0	0	0	
Expected Interest - Leaving Release	0	0	0	0	
Expected Salary - Member Contributions	19,500	20,280	21,091	21,935	
Expected Salary - Company Contributions	19,500	20,280	21,091	21,935	
Required Contribution - Company Funded	361	1,589	1,744	3,695	
Expected Contribution - Member	365	1,521	1,582	3,468	
Expected Contribution - Company Funded	609	2,535	2,636	5,780	
Expected Contribution - Insured Death	122	507	527	1,156	
Expected Contribution - Insured Ill-Health	0	0	0	0	
Expected Interest - Required Company Cont	3	80	202	286	
Expected Interest - Expected Member Cont	3	78	192	273	
Expected Interest - Expected Company Cont	5	130	320	456	
Expected Interest - Expected Insured Death	1	26	64	91	
Expected Interest - Expected Ins. Ill-Health	0	0	0	0	
Actual Salary - Member Contributions	0	0	0	24,078	
Actual Salary - Company Contributions	0	0	0	24,078	
Year Commencing	31/12/2008	31/12/2009	31/12/2010	31/12/2011	
Actual Contribution - Member	0	0	0	4,157	
Actual Contribution - Company Funded	0	0	0	6,928	
Actual Contribution - Insured Death	0	0	0	1,386	
Actual Contribution - Insured Ill-Health	0	0	0	0	
Expected Interest - Actual Member Cont	0	0	0	328	
Expected Interest - Actual Company Cont	0	0	0	546	
Expected Interest - Actual Insured Death	0	0	0	109	
Expected Interest - Actual Ins. Ill-Health	0	0	0	0	
Expected 1% of Salary	49	203	211	462	
Average Contribution Rate - Member	7.500%				
Average Contribution Rate - Company	12.500%				

6.4 Appendix 4

		Claybrook Computing 8.50										Valuation Date 31 December 2011			
Client: AOS		Page 5		TOTAL INDIVIDUAL MEMBER LISTING											
21 February 2012 9:59 AM															
Member Details: Name: Starter Ex		Sex: M	DoB:01/07/1961	DJC:01/05/2008	DJS:01/05/2008	GMP's - Pre-88: æ	0	Post-88: æ	0						

		Claybrook Computing 8.50			Valuation Date 31 December 2011			
Page 11								
Client: AOS		INDIVIDUAL MEMBER ANALYSIS OF SURPLUS LISTING						
21 February 2012 9:59 AM								
Member Details: Name: Starter Ex Sex: M DoB:01/07/1961 DJC:01/05/2008 DJS:01/05/2008 GMP's - Pre-88: æ 0 Post-88: æ								
Year Commencing		31/12/2008	31/12/2009	31/12/2010	31/12/2011			
Expected Reserves - Valuation Anniversaries		8,858	23,652	40,470	45,233			
Expected Interest - Reserve at Previous Valn		620	663	710	1,994			
Expected Interest - Expected Reserve at Exit		0	0	2,355	2,355			
Actual Reserve - Current Valuation/Exit		0	0	0	51,962			
Expected Interest - Actual Reserve at Exit		0	0	0	2,705			
Benefit Paid - Exit		0	0	0	60,000			
Expected Interest - Benefit at Exit		0	0	0	3,124			
Probability of Survival		1.00000	0.99767	0.99508	0.99221			
Probability of Retirement		0.00000	0.00000	0.00000	0.00000			
Probability of Death in Service		0.00233	0.00259	0.00289	0.00000			
Probability of Ill-Health Retirement		0.00000	0.00000	0.00000	0.00000			
Probability of Leaving Service		0.00000	0.00000	0.00000	0.00000			
Expected Total Retirement Benefit Value		0	0	0	0			
Expected Total Death Benefit Value		17,490	33,037	49,059	0			
Expected Total Ill-Health Benefit Value		0	0	0	0			
Expected Total Leavers Benefit Value		0	0	0	0			
Expected Releases - Normal Retirement		0	0	0	0			
Expected Releases - Early Retirement		0	0	0	0			
Expected Releases - Death in Service		-3	-3	6	-1			
Expected Releases - Ill-Health		0	0	0	0			
Expected Releases - Leaving Service		0	0	0	0			
Expected Interest - Normal Ret. Release		0	0	0	0			
Expected Interest - Early Ret. Release		0	0	0	0			
Expected Interest - Death Release		0	0	0	-1			
Expected Interest - Ill-Health Release		0	0	0	0			
Expected Interest - Leaving Release		0	0	0	0			
Expected Salary - Member Contributions		71,536	74,397	77,373	80,468			
Expected Salary - Company Contributions		71,536	74,397	77,373	80,468			
Required Contribution - Company Funded		8,340	9,082	2,470	19,892			
Expected Contribution - Member		5,365	5,580	1,450	12,395			
Expected Contribution - Company Funded		8,942	9,300	2,416	20,658			
Expected Contribution - Insured Death		1,788	1,860	483	4,132			
Expected Contribution - Insured Ill-Health		0	0	0	0			
Expected Interest - Required Company Cont		287	916	1,454	2,658			
Expected Interest - Expected Member Cont		185	580	908	1,673			
Expected Interest - Expected Company Cont		308	967	1,514	2,789			
Expected Interest - Expected Insured Death		62	193	303	558			
Expected Interest - Expected Ins. Ill-Health		0	0	0	0			
Actual Salary - Member Contributions		0	0	0	85,000			
Actual Salary - Company Contributions		0	0	0	85,000			

Year Commencing	31/12/2008	31/12/2009	31/12/2010	31/12/2011
Actual Contribution - Member	3,236	0	0	12,519
Actual Contribution - Company Funded	0	0	0	20,865
Actual Contribution - Insured Death	0	0	0	4,173
Actual Contribution - Insured Ill-Health	0	0	0	0
Expected Interest - Actual Member Cont	0	0	0	1,690
Expected Interest - Actual Company Cont	0	0	0	2,817
Expected Interest - Actual Insured Death	0	0	0	563
Expected Interest - Actual Ins. Ill-Health	0	0	0	0
Expected 1% of Salary	715	744	193	1,653
Average Contribution Rate - Member	7.500%			
Average Contribution Rate - Company	12.500%			

6.5 Appendix 5

Analysis of Surplus Results Summary

Client: AOS
Valn Method: PUC (Control Period 1 year inc Insured Cost)
Valn Dates: 31/12/2008 and 31/12/2011
Basis File: C:\Superval\AOS\For document\Contribution\AOS ACTIVS.APF

		All Members				
		Starter	New	Starter	New	Total
		Enders	Entrant	Exits	Entrant	
		1	1	1	0	3
Select	Number of Members					
New Entrant Profits						
Non-zero Reserve at Entry						
	Reserve at Entry		0		0	0
	plus Expected Interest to Valuation Date		0		0	0
	New Entrant Profit (inc Expected Interest)		0		0	0
Exit Profits						
Retirements						
	Actual Reserve at Exit			51,962	0	51,962
	plus Expected Interest to Valuation Date			2,705	0	2,705
less	Cash Benefit Paid at Exit			60,000	0	60,000
	plus Expected Interest to Valuation Date			3,124	0	3,124
	Actual Release at Exit (inc Expected Interest)			-8,457	0	-8,457
less	Expected Release	0	0	0	0	0
	plus Expected Interest to Valuation Date	0	0	0	0	0
	Total Retirements Profit (inc Expected Interest)	0	0	-8,457	0	-8,457
Deaths in Service						
	Actual Reserve at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
less	Cash Benefit Paid at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
	Actual Release at Exit (inc Expected Interest)				0	0
less	Expected Release	-77	-4		-1	-82
	plus Expected Interest to Valuation Date	-9	-0		-1	-10
plus	Expected Insured Cost Contributions	2,537	1,156		4,132	7,825
	plus Expected Interest to Valuation Date	270	91		558	919
	Total Deaths in Service Profit (inc Expected Interest)	2,893	1,251		4,691	8,835
III-Health Retirements						
	Actual Reserve at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
less	Cash Benefit Paid at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
	Actual Release at Exit (inc Expected Interest)				0	0
less	Expected Release	0	0		0	0
	plus Expected Interest to Valuation Date	0	0		0	0
plus	Expected Insured Cost Contributions	0	0		0	0
	plus Expected Interest to Valuation Date	0	0		0	0
	Total III-Health Retirements Profit (inc Expected Interest)	0	0		0	0

Leavers						
	Actual Reserve at Exit			0	0	0
	plus Expected Interest to Valuation Date			0	0	0
less	Cash Benefit Paid at Exit			0	0	0
	plus Expected Interest to Valuation Date			0	0	0
	Actual Release at Exit (inc Expected Interest)			0	0	0
less	Expected Release	0	0	0	0	0
	plus Expected Interest to Valuation Date	0	0	0	0	0
	Total Leavers Profit (inc Expected Interest)	0	0	0	0	0
Unspecified Exits						
	Actual Reserve at Exit			0	0	0
	plus Expected Interest to Valuation Date			0	0	0
less	Cash Benefit Paid at Exit			0	0	0
	plus Expected Interest to Valuation Date			0	0	0
	Actual Release at Exit (inc Expected Interest)			0	0	0
less	Expected Release	0	0	0	0	0
	plus Expected Interest to Valuation Date	0	0	0	0	0
	Total Unspecified Exits Profit (inc Expected Interest)	0	0	0	0	0
Salary Increases Profits						
Reserve Release						
	Expected Reserve at Valn Date/Exit	109,766	7,739	45,233	0	162,739
	plus Expected Interest to Valuation Date			2,355	0	2,355
less	Actual Reserve at Valn Date/Exit	122,457	8,761	51,962	0	183,180
	plus Expected Interest to Valuation Date			2,705	0	2,705
	Total Reserve Release (inc Expected Interest)	-12,690	-1,022	-7,080	0	-20,792
Member Contributions						
	Expected Rate of Member Contributions	7.50%	7.50%	7.50%	0.00%	
	Actual Member Contributions	8,033	4,157	12,519	0	24,709
	plus Expected Interest to Valuation Date	856	328	1,690	0	2,874
less	Expected Member Contributions	7,611	3,468	12,395	0	23,474
	plus Expected Interest to Valuation Date	811	273	1,673	0	2,758
	Member Contributions Profit (inc Expected Interest)	467	743	141	0	1,351
Company Contributions						
	Expected Rate of Company Contributions	12.50%	12.50%	12.50%	0.00%	
	Actual Company Contributions	13,388	6,928	20,865	0	41,182
	plus Expected Interest to Valuation Date	1,426	546	2,817	0	4,789
less	Expected Company Contributions	12,685	5,780	20,658	0	39,123
	plus Expected Interest to Valuation Date	1,352	456	2,789	0	4,596
	Company Contributions Profit (inc Expected Interest)	779	1,238	235	0	2,252
Death Insured Contributions						
	Expected Rate of Death Insured Contributions	2.50%	2.50%	2.50%	0.00%	
	Actual Death Insured Contributions	2,678	1,386	4,173	0	8,236
	plus Expected Interest to Valuation Date	285	109	563	0	958
less	Expected Death Insured Contributions	2,537	1,156	4,132	0	7,825
	plus Expected Interest to Valuation Date	270	91	558	0	919
	Death Insured Contributions Profit (inc Expected Interest)	156	248	47	0	450
III-Health Insured Contributions						
	Expected Rate of III-Health Insured Contributions	0.00%	0.00%	0.00%	0.00%	
	Actual III-Health Insured Contributions	0	0	0	0	0
	plus Expected Interest to Valuation Date	0	0	0	0	0
less	Expected III-Health Insured Contributions	0	0	0	0	0
	plus Expected Interest to Valuation Date	0	0	0	0	0
	III-Health Insured Contributions Profit (inc Expected Interest)	0	0	0	0	0
Funding Level Profit						
	Required Rate of Company Contributions	11.25%	7.99%	12.04%	0.00%	
	Expected Company Contributions	12,685	5,780	20,658	0	39,123
	plus Expected Interest to Valuation Date	1,352	456	2,789	0	4,596
less	Required Company Contributions	11,414	3,695	19,892	0	35,001
	plus Expected Interest to Valuation Date	1,189	286	2,658	0	4,133
	Funding Level Profit (inc Expected Interest)	1,432	2,256	897	0	4,585

Calculation Error

Calculated Reserve at Valn Date/Exit	109,766	7,718	45,113	0	162,597
Expected Reserve at Valn Date/Exit	109,766	7,739	45,233	0	162,739
Error in Reserve Build-Up	-0	-22	-120	0	-142
% Error in Reserve Build-Up	0.000%	-0.282%	-0.265%	0.000%	-0.087%

Summary

Sum of Profits

New Entrant Profit (inc Expected Interest)	0	0	0	0	0
Total Retirements Profit (inc Expected Interest)	0	0	-8,457	0	-8,457
Total Deaths in Service Profit (inc Expected Interest)	2,893	1,251	4,691	0	8,835
Total Ill-Health Retirements Profit (inc Expected Interest)	0	0	0	0	0
Total Leavers Profit (inc Expected Interest)	0	0	0	0	0
Total Unspecified Exits Profit (inc Expected Interest)	0	0	0	0	0
Total Reserve Release (inc Expected Interest)	-12,690	-1,022	-7,080	0	-20,792
Member Contributions Profit (inc Expected Interest)	467	743	141	0	1,351
Company Contributions Profit (inc Expected Interest)	779	1,238	235	0	2,252
Death Insured Contributions Profit (inc Expected Interest)	156	248	47	0	450
Ill-Health Insured Contributions Profit (inc Expected Interest)	0	0	0	0	0
Funding Level Profit (inc Expected Interest)	1,432	2,256	897	0	4,585
Error in Reserve Build-Up	-0	-22	-120	0	-142
Total Profit (inc Expected Interest)	-6,964	4,693	-9,645	0	-11,916

Cross-Check

Reserves at Previous Valuation Date	72,509		8,858		81,367
plus Expected Interest to Valuation Date	16,318		1,994		18,311
less Reserves at Current Valuation Date	122,457	8,761	0	0	131,218
plus Actual Contributions Paid	24,099	12,471	37,557	0	74,127
plus Expected Interest to Valuation Date	2,568	983	5,070	0	8,621
less Actual Benefits Paid	0	0	60,000	0	60,000
plus Expected Interest to Valuation Date	0	0	3,124	0	3,124
Total Profit (inc Expected Interest)	-6,964	4,693	-9,645	0	-11,916

6.6 Appendix 6

AOS Summary Listing

Analysis of Surplus Results Summary

Client: AOS Pensioners
Valn Method: NPN
Valn Dates: 31/12/2008 and 31/12/2011
Basis File: C:\Superval\AOS\For document\Pensioners\PENSAOSDATA.NPF

		All Members				
		Starter	New	Starter	New	Total
		Enders	Entrant	Exits	Entrant	
		1	1	1	0	3
Select	Number of Members					
New Entrant Profits						
	Reserve at Entry		11,056		0	11,056
	plus Expected Interest to Valuation Date		2,367		0	2,367
	New Entrant Profit (inc Expected Interest)		-13,422		0	-13,422
Exit Profits						
<u>Deaths on Pension</u>						
	Actual Reserve at Exit			14,226	0	14,226
	plus Expected Interest to Valuation Date			741	0	741
less	Cash Benefit Paid at Exit			5,500	0	5,500
	plus Expected Interest to Valuation Date			286	0	286
	Actual Release at Exit (inc Expected Interest)			9,181	0	9,181
less	Expected Release	817	0	597	0	1,414
	plus Expected Interest to Valuation Date	84	0	79	0	163
	Total Deaths on Pension Profit (inc Expected Interest)	-901	0	8,504	0	7,604
<u>Unspecified Exits</u>						
	Actual Reserve at Exit			0	0	0
	plus Expected Interest to Valuation Date			0	0	0
less	Cash Benefit Paid at Exit			0	0	0
	plus Expected Interest to Valuation Date			0	0	0
	Actual Release at Exit (inc Expected Interest)			0	0	0
less	Expected Release	0	0	0	0	0
	plus Expected Interest to Valuation Date	0	0	0	0	0
	Total Unspecified Exits Profit (inc Expected Interest)	0	0	0	0	0
Pension Increases Profits						
<u>Reserve Release</u>						
	Expected Reserve at Valn Date/Exit	14,331	10,750	14,226	0	39,307
	plus Expected Interest to Valuation Date			741	0	741
less	Actual Reserve at Valn Date/Exit	14,484	10,750	14,226	0	39,460
	plus Expected Interest to Valuation Date			741	0	741
	Total Reserve Release (inc Expected Interest)	-153	0	0	0	-153
<u>Pension Payments</u>						
	Expected Pension Payments	3,230	2,475	2,383	0	8,088
	plus Expected Interest to Valuation Date	343	198	321	0	861
	Actual Pension Payments	3,250	2,500	2,500	0	8,250
	plus Expected Interest to Valuation Date	345	200	337	0	881
	Pension Payments Profit (inc Expected Interest)	-22	-27	-133	0	-182
Calculation Error						
	Calculated Reserve at Valn Date/Exit	14,331	10,750	14,225	0	39,306
	Expected Reserve at Valn Date/Exit	14,331	10,750	14,226	0	39,307
	Error in Reserve Build-Up	-0	0	-1	0	-1
	% Error in Reserve Build-Up	0.000%	0.000%	-0.007%	0.000%	-0.002%
Summary						
<u>Sum of Profits</u>						
	New Entrant Profit (inc Expected Interest)	0	-13,422	0	0	-13,422
	Total Deaths on Pension Profit (inc Expected Interest)	-901	0	8,504	0	7,604
	Total Unspecified Exits Profit (inc Expected Interest)	0	0	0	0	0
	Total Reserve Release (inc Expected Interest)	-153	0	0	0	-153

Pension Payments Profit (inc Expected Interest)	-22	-27	-133	0	-182
Error in Reserve Build-Up	-0	0	-1	0	-1
Total Profit	-1,075	-13,450	8,370	0	-6,155
Cross-Check					
Reserves at Previous Valuation Date	13,880		13,872		27,752
plus Expected Interest to Valuation Date	3,124		3,122		6,245
less Reserves at Current Valuation Date	14,484	10,750	0	0	25,234
less Actual Pensions Paid	3,250	2,500	2,500	0	8,250
plus Expected Interest to Valuation Date	345	200	337	0	881
less Actual Benefits Paid	0	0	5,500	0	5,500
plus Expected Interest to Valuation Date	0	0	286	0	286
Total Profit (inc Expected Interest)	-1,075	-13,450	8,370	0	-6,155

6.7 Appendix 7

AOS Summary Listing

Analysis of Surplus Results Summary

Client: test defs AOS

Valn Method: NDF

Valn Dates: 31/12/2008 and 31/12/2011

Basis File: C:\Superval\AOS\For document\Deferreds\AOS DEF.EPF

All Members						
Select	Number of Members	Starter	New	Starter	New	Total
		Enders	Entrant	Exits	Entrant	
		1	1	1	0	3
New Entrant Profits						
	Reserve at Entry		0		0	0
	plus Expected Interest to Valuation Date		0		0	0
	New Entrant Profit (inc Expected Interest)		0		0	0
Exit Profits						
Retirements						
	Actual Reserve at Exit			132,155	0	132,155
	plus Expected Interest to Valuation Date			6,881	0	6,881
less	Cash Benefit Paid at Exit			0	0	0
	plus Expected Interest to Valuation Date			0	0	0
	Actual Release at Exit (inc Expected Interest)			139,036	0	139,036
less	Expected Release	0	0	0	0	0
	plus Expected Interest to Valuation Date	0	0	0	0	0
	Total Retirements Profit (inc Expected Interest)	0	0	139,036	0	139,036
Deaths in Deferment						
	Actual Reserve at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
less	Cash Benefit Paid at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
	Actual Release at Exit (inc Expected Interest)				0	0
less	Expected Release	-518	0	904	0	387
	plus Expected Interest to Valuation Date	-55	0	114	0	58
	Total Deaths in Deferment Profit (inc Expected Interest)	573	0	-1,018	0	-445
Unspecified Exits						
	Actual Reserve at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
less	Cash Benefit Paid at Exit				0	0
	plus Expected Interest to Valuation Date				0	0
	Actual Release at Exit (inc Expected Interest)				0	0
less	Expected Release	0	0		0	0
	plus Expected Interest to Valuation Date	0	0		0	0
	Total Unspecified Exits Profit (inc Expected Interest)	0	0		0	0
Pension Increases Profits						
Reserve Release						
	Expected Reserve at Valn Date/Exit	239,266	0	133,100	0	372,365
	plus Expected Interest to Valuation Date			6,930	0	6,930
less	Actual Reserve at Valn Date/Exit	222,491	184,093	132,155	0	538,740
	plus Expected Interest to Valuation Date			6,881	0	6,881
	Total Reserve Release (inc Expected Interest)	16,774	-184,093	993	0	-166,326
Calculation Error						
	Calculated Reserve at Valn Date/Exit	239,266	0	133,049	0	372,314
	Expected Reserve at Valn Date/Exit	239,266	0	133,100	0	372,365
	Error in Reserve Build-Up	0	0	-51	0	-51
	% Error in Reserve Build-Up	0.000%	0.000%	-0.038%	0.000%	-0.014%

Summary

Sum of Profits

New Entrant Profit (inc Expected Interest)	0	0	0	0	0
Total Retirements Profit (inc Expected Interest)	0	0	139,036	0	139,036
Total Deaths in Deferment Profit (inc Expected Interest)	573	0	-1,018	0	-445
Total Unspecified Exits Profit (inc Expected Interest)	0	0	0	0	0
Total Reserve Release (inc Expected Interest)	16,774	-184,093	993	0	-166,326
Error in Reserve Build-Up	0	0	-51	0	-51
Total Profit	17,347	-184,093	138,961	0	-27,785

Cross-Check

Reserves at Previous Valuation Date	195,780		113,433		309,213
plus Expected Interest to Valuation Date	44,059		25,527		69,586
less Reserves at Current Valuation Date	222,491	184,093	0	0	406,585
less Actual Benefits Paid	0	0	0	0	0
plus Expected Interest to Valuation Date	0	0	0	0	0
Total Profit (inc Expected Interest)	17,347	-184,093	138,961	0	-27,785