

## Introduction

### Definition of CARVM

AnnuityMaster is a system for calculating reserves according to the Commissioners' Annuity Reserve Valuation Method (CARVM). This is the valuation method specified for deferred annuities by the NAIC Standard Valuation Law. CARVM is a "greatest present value" valuation method. The method consists of four basic steps:

Project the fund (or funds, if the product is variable, has fund buckets, or is dual fund) from the valuation date to the end of the projection period using the guaranteed provisions. This requires the actuary to decide which benefits are guaranteed for purposes of CARVM.

Calculate guaranteed benefits based on the fund or funds. Annuitization guarantees, cash values, and free partial withdrawal guarantees must all be taken into account.

Calculate the present value of each of the future benefits as of the valuation date.

Find the greatest of these present values; it is the reserve. For statutory and tax reserves, this is floored at the Cash Value as of the valuation date. For tax reserves, this is capped by the Statutory Reserve.

### Defining Product Guarantees and Valuation Assumptions in AnnuityMaster

AnnuityMaster allows the user to define:

A variety of guaranteed benefits (including elective and nonelective benefits),  
Timing of the calculations (including eligibility, frequency of calculation, etc.), and  
Interpretations of what CARVM means (including how nonelective benefits are incorporated).

The calculation of Statutory Reserves for annuities (CARVM) requires the accurate projection of future fund values and cash values which reflect all product guarantees. In addition to providing great flexibility with regard to the specification of policy loads and surrender charges, AnnuityMaster provides support for the following product features:

1. Free Partial Withdrawals
2. Return of Premium
3. Alternate Issue Date logic for policy loads, surrender charges, and/or guar/stat/tax interest
4. Guaranteed Interest Bonuses
5. Guaranteed Persistency Bonuses
6. Non-Elective Benefits (valued separately or as single entity)
7. Minimum Death Benefits for Variable Annuities
8. SEC Rule 6E for Variable Annuities
9. Dual Fund Products



10. Bailout Provisions
11. Equity Indexing

For CARVM valuations, the user must consider the Greatest Present Value (GPV) of all possible policyholder benefits that can occur at all future durations. AnnuityMaster provides for the following common *Benefit Types* for defining *CARVM Items*:

1. GPV of Cash Surrender Value at all future durations
2. GPV of Annuitization Option (also requires corresponding Annuitizations coding)
3. 93% Fund Value Floor
4. Maximize PV of Partial Withdrawals
5. Bailouts Without Surrender Charges
6. Bailouts With Surrender Charges
7. CD Annuity
8. Fund Value
9. High Fund Value (Dual Fund Annuities)
10. CD Annuity with Maximized Partials
11. Fund Value (STAT and Tax)
12. Maximize PV of Partials with GROU
13. Maximize PV of Partials with Threshold

In addition, the Month End Cash Value as of the valuation date in the VMF is an “automatic” CARVM Item which is used in the final reserve comparison when the “winner” is determined.

*CARVM Items* are combined to form a *CARVM Group*. Each *AnnuityMaster Plan Code* has a *CARVM Group* assigned to it which determines the reserve calculations to be performed for each policy in the VMF. The results for each *CARVM Item* can be reported as well as the final reserves.

For each *CARVM Item*, the user may specify:

1. Type of Benefit (see above list)
2. Timing of Benefit to present value (BOM, BOY, EOM, EOY)
3. Whether to include Free Partial Withdrawals at the time the benefit is elected
4. Whether to include Return of Premium in the calculations
5. Mortality and Interest Calculation Parameters to use for Stat and Tax
6. Eligibility Age and Durations that benefit can be elected
7. Period to project CARVM Item stated in months (later of max duration or max proj period)



It may be possible for the user to demonstrate that the GPV occurs at a particular point in time. The user can then limit the calculation of certain CARVM Items to a specific time period. For example, assume that GPV of all future Cash Surrender Values occurs at the tenth duration. The user can then limit the calculation of the CV to the first eleven policy years.

## Inputs to AnnuityMaster

There are two sources of input to AnnuityMaster:

The plan assumption coding defined within the AnnuityMaster screen system.  
The Valuation Master File (VMF).

The product guarantees and valuation parameters themselves are contained in several files which can all be coded in the AnnuityMaster screen system. Any number of plans can be defined. All the information that varies by plan, but not at the individual policy level, is coded in the screens.

Policy level information is reflected in the VMF. The VMF is a file which contains one base policy record (“00” record) for each policy in force. Some specialized policy types require more than one record to describe the annuity.

An extract program creates the VMF from your administrative system. The extract program is unique for each user and may be written by you or by PolySystems, Inc. The specifications for the extract program are defined in the Data Dictionary (*See [AnnuityMaster Data Dictionary](#) for more detail*). The VMF contains all the information that AnnuityMaster needs to decide what parameters to use to value each policy. It also contains any information that varies at the policy level, such as the issue age and the amount of the fund on the valuation date.

AnnuityMaster accommodates a wide variety of annuity interest guarantees and surrender charges which are tied to premium payments by taking advantage of the VMF flexible record design and special coding “switches” within the AnnuityMaster system. The Valuation Master File (VMF) is specially formatted to handle the needs of each particular client. Multiple record types are used to capture special product related information.

