# Section 7: Exclusion Testing

## Requirement to Pass the Stochastic Exclusion Tests

Groups of contracts pass the SET if one of the following is met:

1. Stochastic Exclusion Ratio Test (SERT)—Annually within 12 months before the valuation date the company demonstrates that the groups of contracts pass the SERT defined in Section 7.C.
2. Stochastic Exclusion Demonstration Test—In the first year and at least once every three calendar years thereafter, the company provides a demonstration in the PBR Actuarial Report as specified in Section 7.D.
3. SET Certification Method—For groups of contracts that do not have guaranteed living benefits, future hedging strategies, or pension risk transfer business, in the first year and at least every third calendar year thereafter, the company provides a certification by a qualified actuary that the group of contracts is not subject to material interest rate risk, mortality and/or longevity risk, or asset return volatility risk (i.e., the risk on non-fixed-income investments having substantial volatility of returns, such as common stocks and real estate investments).

**Guidance Note:** The qualified actuary should develop documentation to support the actuarial certification that presents his or her analysis clearly and in detail sufficient for another actuary to understand the analysis and reasons for the actuary’s conclusion that the group of contracts is not subject to material interest rate risk, mortality and/or longevity risk, or asset return volatility risk. Examples of methods a qualified actuary could use to support the actuarial certification include, but are not limited to:

* 1. A demonstration that, for the group of contracts, reserves calculated using requirements under VM-A, VM-C, and VM-V are at least as great as the assets required to support the group of contracts and certificates using the company’s cash-flow testing model under each of the 48 scenarios identified in Section 7.C.1 or alternatively each of the New York seven economic scenarios under each of the three mortality adjustment factors identified in Section 7.C.1.
	2. A demonstration that the group of contracts passed the SERT within 36 months prior to the valuation date and the company has not had a material change in its interest rate risk, mortality and/or longevity risk, or asset return volatility risk.
	3. A qualitative risk assessment of the group of contracts that concludes that the group of contracts does not have material interest rate risk, mortality and/or longevity risk, or asset return volatility. Such assessment would include an analysis of product guarantees, the company’s non-guaranteed elements (NGEs) policy, assets backing the group of contracts, the company’s longevity risk, and the company’s investment strategy.

## Stochastic Exclusion Ratio Test

1. In order to exclude a group of contracts from the SR requirements under the stochastic exclusion ratio test (SERT), a company shall demonstrate that the ratio of (b–a)/c is less than the lesser of [x]% and the percentage change that would trigger the company’s materiality standard, where:

a. a = the adjusted scenario reserve described in Section 7.C.2.a below using the baseline economic scenario (“scenario 9), as described in Appendix 1.E of VM-20, and 100% as the adjustment factor for mortality.

b. b = the largest adjusted scenario reserve described in Section 7.C.2.a below under any of the 16 economic scenarios described in Appendix 1.E of VM-20 under [95]%, 100%, and [105]% of anticipated experience mortality excluding margins. Because mortality variability may differ by company, if the magnitude of the company’s margin for mortality exceeds 5%, then the company shall use the baseline mortality and the mortality augmented by plus and minus the company’s margin for this exercise.

c. c = an amount calculated from the baseline economic scenario described in Appendix 1.E of VM-20, and 100% as the adjustment factor for mortality, that represents the present value of benefits for the policies, adjusted for reinsurance by subtracting ceded benefits. For clarity, premium, ceded premium, expense, reinsurance expense allowance, modified coinsurance reserve adjustment and reinsurance experience refund cash flows shall not be considered “benefits,” but items such as death benefits, surrender or withdrawal benefits and policyholder dividends shall be. For this purpose, the company shall use the benefits cash flows from the calculation of quantity “a” and calculate the present value of those cash flows using the same path of discount rates as used for “a.”

**Guidance Note:** Note that the numerator should be the largest adjusted scenario reserve, minus the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality. This is not necessarily the same as the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, or the absolute value of the biggest difference from the adjusted scenario reserve for the baseline economic scenario and 100% as the adjustment factor for mortality, both of which could lead to an incorrect test result. There are 47 (=16x3-1) combined economic and mortality scenarios that should be compared for the determination of b.

2. In calculating the ratio in Section 7.C.1 above:

a. The company shall calculate an adjusted scenario reserve for the group of contracts for each of the 16 economic scenarios using the three levels of mortality adjustment factors that is equal to either (i) or (ii) below:

* + - * 1. The scenario reserve defined in Section 4, but with the following differences:
1. Using anticipated experience assumptions with no margins, with the exception of mortality factors described in Section 7.C.1.b of this section.
2. Using the interest rates and equity return assumptions specific to each scenario.
3. Using NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows.
4. Shall reflect future mortality improvement in line with anticipated experience assumptions.
5. Shall not reflect correlation between longevity and economic risks.

ii. The gross premium reserve developed from the cash flows from the company’s asset adequacy analysis models, using the experience assumptions of the company’s cash-flow analysis, but with the following differences:

a) Using the interest rates and equity return assumptions specific to each scenario.

b) Using the mortality scalars described in Section 7.C.1.b of this section.

c) Using the methodology to determine NAER and discount rates defined in Section 4 specific to each scenario to discount the cash flows, but using the company’s cash-flow testing assumptions for default costs and reinvestment earnings.

b. The company shall use the most current available baseline economic scenario and the 15 othereconomic scenarios published by the NAIC. The methodology for creating these scenarios can be found in Appendix 1 of VM-20.

c. The company shall use assumptions within each scenario that are dynamically adjusted as appropriate for consistency with each tested scenario.

d. The company may not group together contract types with significantly different risk profiles for purposes of calculating this ratio.

e. If the company has reinsurance arrangements that are pro rata coinsurance and do not materially impact the interest rate risk, longevity risk, or asset return volatility in the contract, then the company may elect to conduct the stochastic exclusion ratio test on only a single basis, either pre-reinsurance-ceded or post-reinsurance-ceded.

3. If the ratio calculated in this section is less than [x]% pre-non-proportional reinsurance, but is greater than [x]% post-non-proportional reinsurance, the group of contracts will still pass the SERT if the company can demonstrate that the sensitivity of the adjusted scenario reserve to economic scenarios is comparable pre- and post-non-proportional reinsurance.

**Guidance Note:** Further description of non-proportional reinsurance is provided in Paragraph 16 of SSAP 61R.

a. An example of an acceptable demonstration:

i. For convenience in notation • SERT = the ratio (b–a)/c defined in Section 7.C.1 above

a) The pre-non-proportional reinsurance results are “gross of non-proportional,” with a subscript “gn,” so denoted SERTgn

b) The post-non-proportional results are “net of non-proportional,” with subscript “nn,” so denoted SERTnn

ii. If a block of business being tested is subject to one or more non-proportional reinsurance cessions as well as other forms of reinsurance, such as pro rata coinsurance, take “gross of non-proportional” to mean net of all prorata reinsurance but ignoring the non-proportional contract(s), and “net of non-proportional” to mean net of *all* reinsurance contracts. That is, treat non-proportional reinsurance as the last reinsurance in, and compute certain values below with and without that last component.

iii. So, if SERTgn ≤ [x]% but SERTnn > [x]%, then compute the largest percent increase in reserve (LPIR) = (b–a)/a, both “gross of non-proportional” and “net of non-proportional.”

LPIRgn = (bgn – agn)/agn

LPIRnn = (bnn – ann)/ann

Note that the scenario underlying bgn could be different from the scenario underlying bnn.

If SERTgn *×* LPIRnn/LPIRgn < [x]%, then the block of contracts passes the SERT.

b. Another more qualitative approach is to calculate the adjusted scenario reserves for the 48 combined economic and mortality scenarios both gross and net of reinsurance to demonstrate that there is a similar pattern of sensitivity by scenario.

1. The SERT may not be used for a group of contracts if, using the current year’s data, (i) the stochastic exclusion demonstration test defined in Section 7.D had already been attempted using the method of Section 7.D.2.a or Section 7.D.2.b and did not pass; or (ii) the qualified actuary had actively undertaken to perform the certification method in Section 7.B.3 and concluded that such certification could not legitimately be made.