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PBR: Reserve Credits for YRT Reinsurance
A Field Test of Three Amendment Proposal Forms (APFs),
Time Zero and Projected Reserves

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A Report to Jason Kehrberg, Chairperson
Life Valuation Committee
American Academy of Actuaries

by
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With the introduction of principle-based reserving (PBR) by the National Association of Insurance Commissioners (NAIC), insurers will be required to hold the higher of (a) formulaic reserves based on prescribed factors and (b) modeled reserves based on cashflow projections that consider a wide range of future economic conditions and use assumptions that depend on experience and credibility specific to an insurer, such as mortality, policyholder behavior, and expenses. As PBR is implemented, the NAIC is monitoring the PBR Actuarial Reports filed by insurers for evidence of problems that might require changes to the Valuation Manual.

In its 2017 reviews of Life PBR Actuarial Reports, the NAIC's Valuation Analysis (E) Working Group (VAWG) found that modeling of yearly renewable term (YRT) reinsurance premiums varied significantly across companies. These differences in modeling yielded material differences in the reinsurance reserve credits claimed by companies. As a result, several alternative Amendment Proposal Forms (APFs) have been proposed for additional consistency in this area. The NAIC's Life Actuarial (A) Task Force (LATF) would like to see results of a field test of these APFs to support its decision of which, if any, of the APFs to adopt.

Between December 2019 and April 2020, the Academy administered a field test in which it asked participating companies to model reserves and reinsurance credits for the formulaic interim solution adopted by the NAIC in 2019 and for all of the proposed APFs currently under consideration by LATF at the NAIC. The specific instructions for the field test were developed by the Life Valuation Committee jointly with representatives of the staff and regulators from the NAIC, as well as staff and members from the American Council of Life Insurers (ACLI). The field test was supported by Oliver Wyman under an agreement with the Academy; Oliver Wyman is also doing analytical work to complement the field test results under agreements with the NAIC and the ACLI. A copy of the instructions for the field test are attached to this report as Appendix A.

In August 2019, 187 companies (for the purposes of this report, "companies" refer to legal entities unless otherwise specified), identified by the NAIC staff as those likely to be subject to PBR when it becomes mandatory, were invited to join a field test of three APFs: 2019-40, 2019-41 and 2019-42. Some companies responded that they did not believe they would be subject to PBR either because they had ceased selling new policies or because they met the conditions of one of the exemptions available for PBR. Many indicated that they could not participate due to lack of time and resources. Sixteen companies indicated that they would participate. For various reasons, five of the 16 withdrew without submitting results, leaving us with 11 entities participating. Within the universe of companies subject to PBR, our participants include both smaller and larger companies; all are direct issuers, none are reinsurers.

This report presents results from submissions by 11 participating companies. The set of results presented here include results from seven companies reporting on term policies, and eight reporting on universal life with secondary guarantee (ULSG) policies (four companies reported separately for both policy types). For both term and ULSG policies, one company provided time zero but not projected reserves. While all results have been examined for consistency, only those

companies that included projected reserves have been summarized in this report: six for term and seven for ULSG.

For term and ULSG policies, respectively, we present four sets of results: 1) the first set shows the distribution of time zero and projected reserve credits for two baseline cases: a) calculated for the interim solution adopted by the NAIC (1/2 cx), and b) calculated for the model where premiums for YRT are assumed to remain unchanged; 2) the second set shows the distribution of time zero and projected reserves for APF 2019-40 calculated for four scenarios specified in the field test instructions; 3) the third set shows the distribution of time zero and projected reserves for APF 2019-41 for three scenarios specified in the instructions; and 4) the fourth set shows the distribution of time zero and projected reserves for APF 2019-42 for four scenarios specified in the field test instructions.

In all cases, results have been reported as a ratio of a reserve credit in dollars to the projected ceded net amounts at risk (NAAR) in thousands of dollars. In every case, the projected ceded NAAR serves as the denominator.

YRT Reserves, Field Test

Companies: 6

**Term
Two Baselines**

Reserve credits equal 1/2 Cx					
Year	25th PCT	75th PCT	Median	Mean	
0	(0.4)	(0.2)	(0.4)	(0.3)	Reserve Credits: Dollars per Thousand Dollars of projected ceded NAAR
1	(0.6)	(0.1)	(0.4)	(0.3)	
2	(0.7)	(0.3)	(0.6)	(0.5)	
3	(0.8)	(0.4)	(0.6)	(0.6)	
4	(0.9)	(0.5)	(0.7)	(0.7)	
5	(0.9)	(0.2)	(0.6)	(0.7)	
10	(1.1)	(0.3)	(0.8)	(1.1)	
20	(1.8)	(0.3)	(0.8)	(2.8)	
30	(3.0)	(0.3)	(0.5)	(2.0)	
No change in YRT premium rates					
Year	25th PCT	75th PCT	Median	Mean	
0	(2.4)	1.3	0.0	(0.5)	
1	(2.5)	1.3	0.1	(0.4)	
2	(3.2)	1.7	(0.0)	(0.4)	
3	(3.0)	1.7	(0.0)	(0.3)	
4	(2.9)	1.7	(0.0)	(0.2)	
5	(2.0)	1.5	0.7	0.1	
10	(1.0)	2.2	0.8	0.5	
20	(1.4)	1.8	0.6	0.2	
30	(0.6)	0.5	(0.6)	0.1	

YRT Reserves, Field Test

Companies: 6

Term

APF 2019-40

2019-40 w/ Action A				
Year	25th PCT	75th PCT	Median	Mean
0	(2.4)	1.3	(0.0)	(0.6)
1	(2.6)	0.8	0.1	(0.5)
2	(2.4)	0.7	(0.0)	(0.5)
3	(2.3)	0.8	(0.0)	(0.4)
4	(2.2)	0.8	(0.1)	(0.3)
5	(2.0)	1.4	0.6	0.0
10	(1.0)	2.5	1.1	0.8
20	(1.4)	1.8	(0.8)	(0.1)
30	(0.6)	0.5	(0.6)	0.1
2019-40 w/ Action B				
Year	25th PCT	75th PCT	Median	Mean
0	(0.6)	2.5	1.1	0.7
1	(0.7)	2.3	1.2	0.7
2	(0.8)	2.3	(0.0)	0.5
3	(0.8)	2.3	(0.0)	0.6
4	(0.9)	2.4	(0.0)	0.7
5	(0.5)	2.9	1.3	1.3
10	0.3	3.4	2.1	2.0
20	(0.9)	3.7	0.6	1.3
30	(0.6)	1.4	(0.6)	0.7
2019-40 w/ Action C				
Year	25th PCT	75th PCT	Median	Mean
0	(0.9)	1.3	0.0	0.2
1	(0.9)	0.8	0.0	0.2
2	(0.0)	0.8	0.0	0.2
3	(0.0)	1.1	0.0	0.3
4	(0.0)	1.2	0.0	0.4
5	(0.0)	1.4	0.7	0.7
10	0.1	2.9	1.4	1.6
20	0.6	2.7	0.9	1.5
30	(0.3)	0.1	0.0	(0.1)
2019-40 w/ Action D				
Year	25th PCT	75th PCT	Median	Mean
0	(0.9)	1.9	0.8	0.9
1	(0.9)	0.9	0.1	0.6
2	(1.0)	1.0	(0.0)	0.7
3	(0.8)	1.1	(0.0)	0.7
4	(0.5)	1.2	(0.0)	0.8
5	(0.2)	1.4	0.7	1.1
10	0.1	3.3	1.4	1.8
20	0.6	3.3	1.0	1.7
30	(0.6)	(0.2)	(0.6)	(0.3)

**Reserve Credits:
Dollars per
Thousand Dollars
of projected
ceded NAAR**

YRT Reserves, Field Test

Companies: 6

Term

APF 2019-41

2019-41 w/ 0% Future Mortality Improvement (FMI)				
Year	25th PCT	75th PCT	Median	Mean
0	(1.0)	0.3	(0.3)	(0.3)
1	(0.6)	0.4	(0.1)	(0.2)
2	(0.7)	0.3	(0.3)	(0.3)
3	(0.7)	0.4	(0.5)	(0.3)
4	(0.8)	0.5	(0.7)	(0.2)
5	(0.8)	1.4	(0.1)	0.2
10	(1.2)	2.4	0.3	0.8
20	(1.9)	3.7	2.8	0.5
30	(0.7)	1.1	(0.6)	0.4
2019-41 w/ 0.5% FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(0.2)	0.7	0.0	0.3
1	0.1	0.9	0.4	0.4
2	(0.0)	0.6	0.3	0.4
3	(0.0)	0.5	0.3	0.5
4	(0.0)	0.3	0.3	0.5
5	0.0	1.7	0.3	0.9
10	0.1	2.5	0.6	1.5
20	(0.2)	4.0	0.6	0.6
30	(0.7)	1.5	(0.6)	0.8
2019-41 w/ 1.0% FMI				
Year	25th PCT	75th PCT	Median	Mean
0	0.0	1.2	0.4	0.8
1	0.2	1.4	1.1	0.9
2	(0.2)	1.2	1.1	0.9
3	(0.2)	1.3	1.1	1.1
4	0.3	1.3	0.9	1.1
5	0.8	2.3	1.2	1.5
10	(0.5)	3.2	2.1	2.1
20	(3.0)	4.2	1.4	0.6
30	(0.6)	1.9	(0.6)	1.0

**Reserve Credits:
Dollars per
Thousand Dollars
of projected
ceded NAAR**

YRT Reserves, Field Test

Companies: 6

Term

APF 2019-42

2019-42 w/ 0% Future Mortality Improvement (FMI)				
Year	25th PCT	75th PCT	Median	Mean
0	(0.4)	1.3	0.4	0.3
1	(0.4)	0.9	0.5	0.4
2	(0.3)	0.8	0.0	0.4
3	(0.2)	0.9	0.0	0.5
4	(0.2)	1.0	0.0	0.6
5	(0.2)	1.9	0.6	1.0
10	0.7	3.0	1.7	1.7
20	(0.9)	3.8	3.1	1.8
30	(0.6)	1.5	(0.6)	0.8
2019-42 w/ 10-years FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(0.2)	1.5	0.5	0.6
1	(0.2)	1.2	0.6	0.7
2	0.0	1.2	0.1	0.8
3	0.0	1.3	0.2	0.9
4	0.2	1.4	0.3	1.0
5	0.4	2.2	1.2	1.4
10	0.7	3.1	2.5	2.1
20	(0.3)	4.2	1.8	2.0
30	(0.6)	2.0	(0.6)	1.1
2019-42 w/ 15-years FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(0.1)	1.6	0.5	0.8
1	(0.0)	1.4	0.7	0.9
2	0.3	1.4	0.3	1.0
3	0.4	1.5	0.8	1.2
4	0.5	1.6	1.3	1.3
5	0.9	2.3	1.8	1.7
10	1.2	3.7	3.0	2.5
20	0.5	4.2	0.6	2.2
30	(0.6)	2.4	(0.6)	1.4
2019-42 w/ 20-years FMI				
Year	25th PCT	75th PCT	Median	Mean
0	0.0	1.6	0.6	0.9
1	0.1	1.5	0.8	1.0
2	0.5	1.5	0.8	1.2
3	0.6	1.6	1.3	1.3
4	0.7	1.9	1.8	1.5
5	1.1	2.5	2.2	1.9
10	1.4	4.4	3.0	2.8
20	(0.6)	4.2	1.2	2.5
30	(0.6)	2.9	(0.6)	1.7

**Reserve Credits:
Dollars per
Thousand Dollars
of projected
ceded NAAR**

YRT Reserves, Field Test

Companies: 7

ULSG

Two Baselines

Reserve credits equal 1/2 Cx					
Year	25th PCT	75th PCT	Median	Mean	
0	(0.3)	(0.1)	(0.2)	(0.6)	Reserve Credits:
1	(1.0)	(0.3)	(0.4)	(0.9)	Dollars per
2	(1.5)	(0.5)	(0.6)	(1.1)	Thousand Dollars
3	(1.6)	(0.6)	(0.7)	(1.3)	of projected
4	(1.8)	(0.7)	(0.9)	(1.4)	ceded NAAR
5	(1.7)	(0.5)	(1.1)	(1.4)	
10	(3.4)	(2.1)	(2.8)	(3.0)	
20	(12.8)	(5.7)	(8.4)	(9.4)	
30	(37.3)	(12.1)	(25.4)	(25.8)	
No change in YRT premium rates					
Year	25th PCT	75th PCT	Median	Mean	
0	(40.1)	(8.9)	(25.3)	(24.0)	
1	(38.7)	(9.3)	(27.3)	(24.1)	
2	(42.6)	(19.8)	(34.2)	(29.7)	
3	(45.3)	(21.2)	(36.9)	(31.6)	
4	(48.2)	(22.6)	(39.8)	(33.6)	
5	(50.1)	(11.7)	(37.8)	(30.5)	
10	(67.7)	(13.4)	(56.1)	(40.0)	
20	(128.5)	(23.2)	(116.3)	(74.2)	
30	(225.8)	(41.6)	(191.8)	(127.9)	

YRT Reserves, Field Test

Companies: 7

ULSG

APF 2019-40

2019-40 w/ Action A					
Year	25th PCT	75th PCT	Median	Mean	
0	(27.2)	(0.4)	(3.3)	(13.3)	Reserve Credits:
1	(28.1)	(1.9)	(3.2)	(15.0)	Dollars per
2	(36.8)	(1.8)	(10.0)	(18.1)	Thousand Dollars
3	(39.0)	(1.7)	(10.3)	(19.1)	of projected
4	(41.4)	(1.6)	(10.6)	(20.1)	ceded NAAR
5	(35.3)	(0.2)	(3.8)	(18.0)	
10	(46.1)	(1.0)	(1.4)	(22.5)	
20	(78.1)	(1.2)	(2.2)	(37.2)	
30	(126.1)	(0.3)	(17.0)	(60.4)	
2019-40 w/ Action B					
Year	25th PCT	75th PCT	Median	Mean	
0	(17.2)	7.0	4.2	(4.3)	
1	(16.7)	4.3	0.8	(3.2)	
2	(18.8)	2.6	(6.3)	(8.3)	
3	(19.2)	2.9	(6.6)	(8.4)	
4	(19.4)	3.1	(6.9)	(8.4)	
5	(18.7)	7.6	1.2	(2.4)	
10	(28.5)	11.7	0.8	(4.7)	
20	(40.0)	19.8	(1.6)	(9.8)	
30	(51.2)	23.0	(0.5)	(19.1)	
2019-40 w/ Action C					
Year	25th PCT	75th PCT	Median	Mean	
0	(12.2)	0.2	(2.7)	(6.9)	
1	(11.9)	(1.2)	(4.0)	(7.8)	
2	(13.3)	(2.5)	(7.1)	(9.6)	
3	(13.9)	(2.6)	(7.3)	(9.9)	
4	(14.6)	(2.7)	(7.4)	(10.3)	
5	(13.7)	(0.6)	(5.2)	(8.4)	
10	(18.0)	1.0	(8.9)	(9.5)	
20	(31.3)	3.6	(14.6)	(11.6)	
30	(43.7)	(15.5)	(29.9)	(17.4)	
2019-40 w/ Action D					
Year	25th PCT	75th PCT	Median	Mean	
0	(11.3)	4.9	(2.2)	(4.9)	
1	(10.9)	(0.6)	(3.8)	(5.3)	
2	(12.3)	(1.4)	(6.4)	(8.9)	
3	(12.8)	(1.4)	(6.6)	(9.3)	
4	(13.4)	(1.4)	(6.8)	(9.6)	
5	(12.5)	0.3	(4.9)	(7.7)	
10	(16.4)	2.2	(8.5)	(8.6)	
20	(29.1)	4.2	(19.2)	(11.2)	
30	(43.1)	(6.2)	(14.2)	(11.7)	

YRT Reserves, Field Test

Companies: 7

ULSG

APF 2019-41

2019-41 w/ 0% Future Mortality Improvement (FMI)				
Year	25th PCT	75th PCT	Median	Mean
0	(19.0)	4.3	1.4	(7.0)
1	(19.4)	3.1	2.3	(8.2)
2	(23.3)	3.9	(5.6)	(10.3)
3	(24.5)	4.4	(5.9)	(10.8)
4	(25.7)	4.7	(6.2)	(11.3)
5	(23.7)	6.2	3.8	(9.0)
10	(30.7)	9.7	4.6	(10.3)
20	(53.9)	18.4	3.3	(14.8)
30	(86.5)	24.4	(2.4)	(18.1)
2019-41 w/ 0.5% FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(13.1)	7.6	5.9	(2.4)
1	(13.3)	7.6	6.3	(2.6)
2	(16.8)	8.4	(0.6)	(4.3)
3	(17.7)	9.1	(0.4)	(4.4)
4	(18.6)	9.9	(0.2)	(4.5)
5	(16.6)	11.3	10.3	(2.0)
10	(23.0)	16.0	13.9	(1.7)
20	(45.1)	28.9	16.8	(2.3)
30	(71.3)	39.8	22.7	(1.2)
2019-41 w/ 1.0% FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(7.6)	9.9	4.8	1.7
1	(7.5)	12.2	4.9	1.9
2	(10.8)	11.9	1.3	0.5
3	(11.3)	12.9	1.5	0.6
4	(12.0)	13.9	1.7	0.8
5	(10.0)	17.6	7.7	3.6
10	(15.7)	22.6	13.2	5.2
20	(35.0)	32.7	28.3	7.4
30	(56.3)	47.0	43.0	12.3

ULSG

APF 2019-42

2019-42 w/ 0% Future Mortality Improvement (FMI)				
Year	25th PCT	75th PCT	Median	Mean
0	(18.4)	(0.2)	(4.3)	(9.4)
1	(18.9)	(1.2)	(7.5)	(10.5)
2	(24.7)	(7.6)	(9.2)	(13.7)
3	(26.3)	(8.1)	(9.8)	(14.5)
4	(28.0)	(8.6)	(10.4)	(15.3)
5	(24.2)	0.0	(9.9)	(12.4)
10	(33.6)	1.5	(15.6)	(15.7)
20	(61.9)	5.9	(30.6)	(25.3)
30	(89.5)	18.8	(24.0)	(27.9)
2019-42 w/ 10-years FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(14.9)	1.7	(3.1)	(6.9)
1	(15.3)	0.9	(6.2)	(7.9)
2	(20.9)	(5.5)	(6.7)	(10.8)
3	(22.3)	(5.8)	(7.1)	(11.5)
4	(23.7)	(6.1)	(7.6)	(12.1)
5	(19.8)	3.0	(8.2)	(9.1)
10	(28.5)	5.2	(13.2)	(11.7)
20	(56.5)	11.3	(27.0)	(19.8)
30	(84.0)	23.6	(13.7)	(21.3)
2019-42 w/ 15-years FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(12.1)	3.4	(2.3)	(4.8)
1	(13.0)	2.7	(3.5)	(5.6)
2	(18.0)	(3.1)	(4.7)	(8.3)
3	(19.2)	(3.2)	(5.0)	(8.9)
4	(20.4)	(3.4)	(5.4)	(9.4)
5	(16.7)	5.6	(5.6)	(6.4)
10	(24.3)	8.5	(10.8)	(8.2)
20	(52.0)	15.9	(23.3)	(15.0)
30	(79.6)	27.4	(3.3)	(15.5)
2019-42 w/ 20-years FMI				
Year	25th PCT	75th PCT	Median	Mean
0	(9.9)	4.4	(0.3)	(3.1)
1	(10.7)	4.2	(1.7)	(3.7)
2	(15.3)	(1.0)	(3.2)	(6.3)
3	(16.3)	(1.0)	(3.6)	(6.7)
4	(17.3)	(1.1)	(4.0)	(7.1)
5	(14.1)	7.8	(4.0)	(4.2)
10	(21.1)	11.2	(8.9)	(5.5)
20	(47.1)	20.0	(19.5)	(10.7)
30	(75.4)	32.3	4.3	(10.3)

**Reserve Credits:
Dollars per
Thousand Dollars
of projected
ceded NAAR**

Appendix A

YRT Field Test for PBR/VM-20

This appendix includes the instructions distributed to participants in the field test on December 18, 2019 (“Participant Field Test Instructions”) and which reference in Appendix 4 an earlier set of instructions distributed on October 22, 2019 (“Model Prep Instructions”). Those earlier instructions immediately follow.

YRT Field Test for PBR/VM-20

Participant Field Test Instructions

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Introduction and General Testing Instructions

Thank you for participating in the YRT Reinsurance Field Test for PBR/VM-20 (field test). Your participation is critical to the success of the field test. Anonymized results from the field test will be used to inform regulators as they work to resolve the issue of how companies should determine the YRT reinsurance reserve credit for VM-20 modeled reserves.

Regulators have received multiple Amendment Proposal Forms (APFs) proposing various solutions to the issue. This document contains instructions for testing the three APFs selected for the field test:

- APF 2019-40 – Actuarial judgement with clarified modeling principles/guidance
- APF 2019-41 – Remove margins from YRT claims, i.e. from mortality rates (q_x)
- APF 2019-42 – Add margins to YRT premiums.

Each APF proposes different changes to the language in VM-20 Section 8 Reinsurance. Review during field test design resulted in revisions to the APFs and ensured they work with the 2020 version of the Valuation Manual (VM). When testing, please use the 2020 VM along with the specific proposed language for each APF (with field test revisions) as provided in Appendices 1, 2 and 3.

As a reminder, on 10/22/2019 participants received Model Prep Instructions for the field test with important information such as key modeling capabilities, the time zero valuation date and yield curve, inforce file creation, treatment of non-YRT reinsurance, assumptions and scenarios for inner and outer loops, key output to capture, and the two YRT modeling approaches for generating baseline results:

- Baseline 1 – The current $\frac{1}{2}$ Cx interim solution
- Baseline 2 – No change to current YRT premiums.

Participants should complete model prep and generate results for the two baselines before testing the three APFs. The instructions that follow presume starting with those baseline models. For reference, a copy of the Model Prep Instructions is provided in Appendix 4.

Finally, please review the timeframe for the field test, which was provided with the Model Prep Instructions:

Mid October	<ul style="list-style-type: none">• Participants receive model prep instructions containing guidance on preparing their baseline models for the field test.
Early November	<ul style="list-style-type: none">• Participants receive field test instructions for using their baseline models to perform focused testing of three potential long-term APF solutions.• Participants receive a brief survey to collect information on how they intend to model three potential long-term APF solutions.
Mid November	<ul style="list-style-type: none">• Participants receive an output template for collecting and submitting field test results.
End of December	<ul style="list-style-type: none">• Completed output template due to the Academy.• Since some participants may be new to the nested modeling needed to project VM-20 reserves, late submissions of projected reserves will be accepted until the end of February.

APF 2019-40 Testing Instructions

Instructions for field testing APF 2019-40

1. The company should perform a VM-20 reserve calculation, and if possible, projection of future reserve results, using the 2020 *Valuation Manual*, except modified by APF 2019-40 under four counterparty action scenarios which apply equally to ceding and assuming companies.
 - a. Model current YRT rates for all projection years; Apply the APF only with regards to other counterparty actions such as default, recapture or other terminations.
 - b. Model a prudent estimate of all counterparty actions; Apply the APF with no additional restrictions or guidance.
 - c. Model prudent estimate of rate changes only after reaching the Loss ratio trigger. The Loss ratio is calculated by reviewing cumulative projected reinsurance cash flows from the assuming company perspective. When the Loss ratio exceeds 115% a rate change should be modeled;
 - d. Model prudent estimate of rate changes only after reaching Consecutive Years of Loss trigger. The Losses are calculated by reviewing annual projected reinsurance cash flows from the assuming company perspective. When Losses are observed in 5 consecutive years, a rate change should be modeled;

APF 40 Sections 8.C.8 through 12 require a review of the reinsurance treaty cashflows, and subsequent assumptions regarding counterparty actions.

Disclosures to be provided when field testing APF 2019-40

1. For each scenario result (b, c and d), disclose whether YRT rates were modeled to change, by how much and/or how often as well as (in the case of scenario b) the trigger for such action. Disclose sensitivity test results and rationale for selecting modeled rate change assumptions.
2. For each scenario result (a, b, c, d), disclose whether, and if so in what time period, the company assumed recapture/contract termination would occur. Disclose sensitivity test results and rationale for selecting modeled assumption.
3. If any actions are modeled with respect to Sections 8.C.8, 14, 15 or 16 please disclose.
4. If there are features of the YRT reinsurance treaty or rates that you believe make the trigger outlined in scenario c or d unreasonable, please describe.
5. Disclose any material modeling simplifications and/or approximations applied.

APF 2019-41 Testing Instructions

Instructions for field testing APF 2019-41

1. The company should perform a VM-20 reserve calculation, and if possible, projection of future reserve results, using the 2020 *Valuation Manual*, except modified by APF 2019-41. For the purpose of this field test, there is one modification to APF 2019-41 — rather than using the company's best estimate of future mortality improvement as described in Section 8.C.8.b of the APF, calculate the VM-20 reserve three times using the following three mortality improvement scenarios: 0%, 0.5%, and 1% annual future mortality improvement applied for 15 years after the valuation date.
2. The future mortality improvement scenarios of 0%, 0.5%, 1% for 15 years after the valuation date should only be applied for projected reinsurance claim settlements, not the actual pre-reinsurance death claims.

Disclosures to be provided when field testing APF 2019-41

1. For each scenario result (0%, 0.5%, 1.0% improvement for 15 years), disclose whether, and if so in what time period, the company assumed recapture would occur.
2. Disclose any material modeling simplifications and/or approximations applied.
3. For each scenario result (0%, 0.5%, 1.0% improvement for 15 years), disclose whether the improvement is higher or lower than that assumed by the company for the same block of business as part of CFT. In addition, disclose the "company's best estimate of mortality improvement" (both the improvement level and length).

APF 2019-42 Testing Instructions

Instructions for field testing APF 2019-42

1. The company should perform a VM-20 reserve calculation, and if possible, projection of future reserve results, using the 2020 *Valuation Manual*, except modified by APF 2019-42 under four mortality improvement scenarios: 5, 10, 15, and 20 years of future mortality improvement.
2. For the purposes of the field testing reserve calculations, the company should not make any modification to the standard assumption based on Section 8.C.18.c. Instead, the impact of Section 8.C.18.c will be assessed through narrative response.

Disclosures to be provided when field testing APF 2019-42

1. Separately for each scenario (5, 10, 15, and 20 years), disclose whether, and if so in what time period, the company would assume recapture would occur if the company were to follow Section 8.C.18.c.
2. Separately for each scenario (5, 10, 15, and 20 years), if the company were to follow Section 8.C.18.c, disclose whether a different variation in the reinsurance premium assumption under VM-20 Section 8.C.18.c would be applied, and if so describe the variation and reasoning. Also disclose whether this treatment has been discussed with the domiciliary commissioner and their response to the treatment.

3. Disclose whether the minimum credibility (80%) and/or the minimum SDP (10 years) were applied due to being higher than the company's calculated credibility and SDP under VM-20. If possible, results with and without these minimums should be provided, to ensure that they are functioning as intended, which was to avoid unfair and unrealistic high reinsurance premium margins on small companies or new blocks of business. If a full retesting is not possible, a qualitative assessment of the impact of these minimums is requested.
4. For each scenario result (5, 10, 15, and 20 years), disclose whether the length of projected mortality improvement is longer or shorter than that assumed by the company for the same block of business as part of CFT.
5. Disclose whether the mortality improvement rates of Section 9.C.3.g are higher or lower annual rates overall than those assumed by the company for the same block of business as part of CFT. [For the purposes of this response, compare annual rates only – disregarding the length of time that mortality improvement is applied.]
6. Disclose any material modeling simplifications and/or approximations applied.

Participant Field Test Instructions

APPENDICES

Appendix 1A – APF 2019-40 Revised Language (clean)

VM-20 Section 8: Reinsurance [Replace section]

A. General Considerations

1. In this section, reinsurance includes retrocession, and assuming company includes retrocessionaire.

Guidance Note: In determining reserves, one party to a reinsurance transaction may make use of reserve calculations of the other party. In this situation, if the company chooses assumptions that differ from those used by the other party, the company must either rerun the reserve calculation or be prepared to demonstrate that appropriate adjustments to the other party's calculations have been made.

2. The company shall assume that the laws and regulations in place as of the valuation date regarding credit for reinsurance remain in effect throughout the projection period.
3. A company shall include a reinsurance agreement or amendment in calculating the minimum reserve if, under the terms of the AP&P Manual, the agreement or amendment qualifies for credit for reinsurance.
4. If a reinsurance agreement or amendment does not qualify for credit for reinsurance but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the minimum reserve by the absolute value of such reductions in surplus.

Guidance Note: Section 8.A.3 provides that, in general, if a treaty does not meet the requirements for credit for reinsurance, it should not be allowed to reduce the reserve. Thus, it should not be allowed a reinsurance credit to the NPR, and its cash flows should not be included in the cash-flow models used to calculate the deterministic or stochastic reserve. Section 8.A.4 introduces the exception that if allowing a net premium credit and including the treaty cash flows in the cash-flow models would produce a more conservative result, then that more conservative result should prevail.

5. The company shall base its company and counterparty action assumptions relating to YRT reinsurance consistent with the moderately adverse environment as applicable to the valuation of all life policyholders.

Guidance Note: This consideration is intended to preclude assuming that other reinsured blocks have positive experience that would offset the statutory conservatism prescribed in the mortality assumption.

6. The company shall base its company and counterparty action assumptions relating to YRT reinsurance treaty changes reflecting that, in general, there is no relevant company or industry experience currently available upon which to base the anticipated experience assumption.

Guidance Note: Although some companies may have experience with adverse mortality on particular reinsured blocks, this would not be directly relevant to the scenario where industry mortality is adverse, as per the prescribed scenario. Assumptions and margins related to treaty provisions are therefore subject to Sections 9.A.6.c and 9.B.2 and the sensitivity tests required in Section 9.A.6.d. With respect to Section 9.B.2 “margin” should be interpreted to mean the degree of conservatism reflected in predicting future counterparty actions.

7. Although YRT treaties permanently transfer mortality risk to the assuming company, the assuming company shall not be assumed to incur indefinite losses if treaty terms allow adjustment of the underlying economics.
8. The relationship between assuming companies and the company is between knowledgeable counterparties, and should be expected to result in negotiated contractual changes, subject to provisions of the treaty(ies), and after reflecting the output of modeled policyholder cashflows.
9. In addition, it should not be assumed that assuming reinsurers would take rate increase actions that are not a realistic reflection of the likely timing and magnitude of the rate actions that would unfold under the prescribed mortality scenario, based solely on the reinsurer’s foreknowledge that the prescribed mortality assumption does not allow mortality improvement beyond the valuation date.

B. Determination of a Credit to the NPR to Reflect Reinsurance Ceded

1. Determination of the credit to the NPR to reflect reinsurance shall be done in accordance with *SSAP No. 61R—Life, Deposit-Type and Accident and Health Reinsurance* in the AP&P Manual.

Guidance Note: The credit taken under a coinsurance arrangement shall be calculated using the same methodology and assumptions used in determining its NPR, but only for the percentage of the risk that was reinsured. If the reinsurance is on a YRT basis, the credit shall be calculated using the assumptions used in determining the NPR, but for the net amount at risk.

2. If a company cedes a portion of a policy under more than one reinsurance agreement, then the company shall calculate a credit separately for each such agreement. The credit for reinsurance ceded for the policy shall be the sum of the credits for all such agreements.
3. The credit for reinsurance ceded applied to a group of policies shall be the sum of the credit for reinsurance ceded for each of the policies of the group.

C. Reflection of Reinsurance Cash Flows in the Deterministic Reserve or Stochastic Reserve

In calculations of the deterministic reserve or stochastic reserve pursuant to Section 4 and Section 5:

1. The company shall use anticipated experience assumptions and margins that are appropriate for each company pursuant to a reinsurance agreement. In such instance, the ceding and assuming companies are not required to use the same assumptions and margins for the reinsured policies unless they are affiliated.

2. To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk, the company shall do one of the following:
 - a. Stochastically model the risk factors directly in the cash-flow model when calculating the stochastic reserve.
 - b. Perform a separate stochastic analysis outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The company shall use the results of this analysis to adjust prudent estimate assumptions or to determine an amount to adjust the stochastic reserve to adequately make provision for the risks of the reinsurance features.

<p>Guidance Note: An example of reinsurance provisions where a single deterministic valuation assumption will not adequately capture the risk is stop-loss reinsurance.</p>
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3. The company shall determine cash flows for reinsurance ceded subject to the following:
 - a. The company shall include the effect of projected cash flows received from or paid to assuming companies under the terms of ceded reinsurance agreements in the cash flows used in calculating the deterministic reserve in Section 4 and stochastic reserves in Section 5.
 - b. If cash flows received from or paid to assuming companies under the terms of any reinsurance agreement are dependent upon cash flows received from or paid to assuming companies under other reinsurance agreements, the company shall first determine reinsurance cash flows for reinsurance agreements with no such dependency and then use the reinsurance cash flows from these independent agreements to determine reinsurance cash flows for the remaining dependent agreements.
 - c. The company shall use prudent estimate assumptions to project cash flows to and from assuming companies that are consistent with other assumptions used by the company in calculating the deterministic or stochastic reserve for the reinsured policies and that reflect the terms of the reinsurance agreements.
4. The company shall determine cash flows for reinsurance assumed subject to the following:
 - a. The company shall include the effect of cash flows projected to be received from and paid to ceding companies under the terms of assumed reinsurance agreements in the cash flows used in calculating the deterministic reserve in Section 4 and the stochastic reserve in Section 5.
 - b. If cash flows received from or paid to ceding companies under the terms of any reinsurance agreement are dependent upon cash flows received from or paid to ceding companies under other reinsurance agreements, the company shall first determine reinsurance cash flows for reinsurance agreements with no such dependency and then use the reinsurance cash flows from these independent agreements to determine reinsurance cash flows for the remaining dependent agreements.

5. If a company assumes a policy under more than one reinsurance agreement, then the company may treat each agreement separately for the purposes of calculating the reserve.
6. An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement.
7. The company shall assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and likely to exercise the terms of the agreement to their respective advantage, taking into account the context of the agreement in the entire economic relationship between the parties. In setting assumptions for the reinsurance cash flows, the company shall include, but not be limited to, the following:
 - a. The usual and customary practices associated with such agreements.
 - b. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
 - c. Any limits placed upon either party's ability to exercise contractual options in the reinsurance agreement.
 - d. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.
 - e. Actions that might be taken by a party if the counterparty is in financial difficulty.

Guidance note: It should be assumed that if any treaty produces a pattern of projected losses to the counter party, that the risk of financial difficulty will increase commensurate with the magnitude of projected losses. The risk of default by the assuming company is addressed in item 14 below. The risk of default by the ceding company is addressed in item 15 below.

8. The company shall account for any actions that the ceding company and, if different, the direct-writing company have taken or are likely to take that could affect the expected cash flows of the reinsured business in determining prudent estimate assumptions for the modeled reserve. Note that these assumptions are in addition to, rather than in lieu of, assumptions as to the behavior of the underlying policyholders.

Guidance Note: Examples of NGE actions the direct-writing company could take include: 1) instituting internal replacement programs or special underwriting programs, both of which could change expected mortality rates; or 2) changing NGE in the reinsured policies, which could affect mortality, policyholder behavior, and possibly expense and investment assumptions. Examples of actions the ceding company could take include: 1) the exercise of contractual options in a reinsurance agreement to influence the setting of NGEs in the reinsured policies; or 2) the ability to participate in claim decisions.

9. The company shall account for any actions that the assuming company has taken or is likely to take that could affect the expected cash flows of the reinsured business in determining prudent estimate assumptions. Appropriate assumptions for these elements may depend on the scenario being tested. The company shall take into account all likely consequences of

the assuming company changing an element of the reinsurance agreement, including any potential impact on the probability of recapture by the ceding company.

Guidance Note: Examples of such actions include, but are not limited to, changes to the current scale of reinsurance premiums and changes to expense allowances.

10. In addition to exercising the terms of the agreement and implementing changes to an agreement, it is appropriate for the actuary to assume that knowledgeable counterparties may renegotiate terms of the agreement to the mutual benefit of both parties or to reflect risk sharing of adverse experience. To the extent that experience is limited in deriving the terms of a renegotiated agreement, or the timing of such renegotiation, the sensitivity tests required in Section 9.A.6.d are required to inform the selection of the assumption set at the conservative end of the plausible range.
11. The company shall take into account any ceding company option to recapture reinsured business. Appropriate assumptions may depend on the scenario being tested (analogous to interest-sensitive lapses).

Guidance Note: Cash flows associated with recapture include recapture fees or other termination settlements.

Guidance Note: To the extent that experience is limited in determining the timing of recapture, the sensitivity tests required in Section 9.A.6.d are required to inform the selection of the assumption set at the conservative end of the plausible range.

Guidance Note: The actions assumed by counterparties with respect to exercising treaty provisions need not all be modeled as some will be mutually exclusive. Exercise of treaty provisions shall be considered and discussed in the PBR actuarial Report.

12. The company shall take into account an assuming company's right to terminate in-force reinsurance business. In the case in which the assuming company's right to terminate is limited to cases of non-payment of amounts due by the ceding company or other specific, limited circumstances, the company may assume that the termination option would be expected to have insignificant value to either party and, therefore, may exclude recognition of this right to terminate in the cash-flow projections. However, if a reinsurance agreement contains other termination provisions with material impact, the company shall set appropriate assumptions for these provisions consistent with the particular scenario being tested.

Guidance Note: To the extent that experience is limited in determining the timing of contract termination, the sensitivity tests required in Section 9.A.6.d are required to inform the selection of the assumption set at the conservative end of the plausible range.

13. If, under the terms of the reinsurance agreement, some of the assets supporting the reserve are held by the counterparty or by another party, the company shall:
 - a. Consider the following in order to determine whether to model such assets for purposes of projecting cash flows:
 - i. The degree of linkage between the portfolio performance and the calculation of the reinsurance cash flows.

- ii. The sensitivity of the valuation result to the asset portfolio performance.
- b. If the company concludes that modeling is unnecessary, document the testing and logic leading to that conclusion.
- c. If the company determines that modeling is necessary, comply with the requirements in Section 7.E and Section 9.F, taking into account:
 - i. The investment strategy of the company holding the assets, as codified in the reinsurance agreement or otherwise based on current documentation provided by that company.
 - ii. Actions that may be taken by either party that would affect the net reinsurance cash flows (e.g., a conscious decision to alter the investment strategy within the guidelines).

Guidance Note: In some situations, it may not be necessary to model the assets held by the other party. An example would be modeling by an assuming company of a reinsurance agreement containing provisions, such as experience refund provisions, under which the cash flows and effective investment return to the assuming company are the same under all scenarios.

Guidance Note: Special considerations for modified coinsurance: Although the modified coinsurance (ModCo) reserve is called a reserve, it is substantively different from other reserves. It is a fixed liability from the ceding company to the assuming company in an exact amount, rather than an estimate of a future obligation. The ModCo reserve is analogous to a deposit. This concept is clearer in the economically identical situation of funds withheld. Therefore, the value of the modified coinsurance reserve generally will not have to be determined by modeling. However, the projected ModCo interest may have to be modeled. In many cases, the ModCo interest is determined by the investment earnings of an underlying asset portfolio, which, in some cases, will be a segregated asset portfolio or in others the ceding company's general account. Some agreements may use a rate not tied to a specific portfolio.

- 14. If a ceding company has knowledge that an assuming company is financially impaired, the ceding company shall establish a margin for the risk of default by the assuming company. In the absence of knowledge that the assuming company is financially impaired, the ceding company shall review the projected future profitability (after consideration of the assuming and ceding company actions modeled) of each group of reinsurance agreements by assuming company and establish a margin for the risk of default by the assuming company that is a function of the profitability of those agreements.

15. If an assuming company has knowledge that a ceding company is financially impaired, the assuming company shall establish a margin for the risk of default by the ceding company. Such margin may be reduced or eliminated if the assuming company has a right to terminate the reinsurance upon non-payment by the ceding company. In the absence of knowledge that a ceding company is financially impaired, the assuming company is not required to establish a margin for the risk of default by the ceding company.
16. In setting any margins required by Section 8.C.14 and Section 8.C.15 to reflect potential uncertainty regarding the receipt of cash flows from a counterparty, the company shall take into account the ratings, RBC ratio or other available information related to the probability of the risk of default by the counterparty, as well as any security or other factor limiting the impact on cash flows.

Appendix 1B – APF 2019-40 Revised Language (redline vs. 2020 VM)

VM-20 Section 8: Reinsurance [Replace section]

A. General Considerations

1. In this section, reinsurance includes retrocession, and assuming company includes retrocessionaire.

Guidance Note: In determining reserves, one party to a reinsurance transaction may make use of reserve calculations of the other party. In this situation, if the company chooses assumptions that differ from those used by the other party, the company must either rerun the reserve calculation or be prepared to demonstrate that appropriate adjustments to the other party's calculations have been made.

2. The company shall assume that the laws and regulations in place as of the valuation date regarding credit for reinsurance remain in effect throughout the projection period.
3. A company shall include a reinsurance agreement or amendment in calculating the minimum reserve if, under the terms of the AP&P Manual, the agreement or amendment qualifies for credit for reinsurance.
4. If a reinsurance agreement or amendment does not qualify for credit for reinsurance but treating the reinsurance agreement or amendment as if it did so qualify would result in a reduction to the company's surplus, then the company shall increase the minimum reserve by the absolute value of such reductions in surplus.

Guidance Note: Section 8.A.3 provides that, in general, if a treaty does not meet the requirements for credit for reinsurance, it should not be allowed to reduce the reserve. Thus, it should not be allowed a reinsurance credit to the NPR, and its cash flows should not be included in the cash-flow models used to calculate the deterministic or stochastic reserve. Section 8.A.4 introduces the exception that if allowing a net premium credit and including the treaty cash flows in the cash-flow models would produce a more conservative result, then that more conservative result should prevail.

5. The company shall base its company and counterparty action assumptions relating to YRT reinsurance consistent with the moderately adverse environment as applicable to the valuation of all life policyholders.

Guidance Note: This consideration is intended to preclude assuming that other reinsured blocks have positive experience that would offset the statutory conservatism prescribed in the mortality assumption.

6. The company shall base its company and counterparty action assumptions relating to YRT reinsurance treaty changes reflecting that, in general, there is no relevant company or industry experience currently available upon which to base the anticipated experience assumption.

Guidance Note: Although some companies may have experience with adverse mortality on particular reinsured blocks, this would not be directly relevant to the scenario where industry mortality is adverse, as per the prescribed scenario. Assumptions and margins related to treaty provisions are therefore subject to Sections 9.A.6.c and 9.B.2 and the sensitivity tests required in Section 9.A.6.d. With respect to Section 9.B.2 “margin” should be interpreted to mean the degree of conservatism reflected in predicting future counterparty actions.

7. Although YRT treaties permanently transfer mortality risk to the assuming company, the assuming company shall not be assumed to incur indefinite losses if treaty terms allow adjustment of the underlying economics.
8. The relationship between assuming companies and the company is between knowledgeable counterparties, and should be expected to result in negotiated contractual changes, subject to provisions of the treaty(ies), and after reflecting the output of modeled policyholder cashflows.
9. In addition, it should not be assumed that assuming reinsurers would take rate increase actions that are not a realistic reflection of the likely timing and magnitude of the rate actions that would unfold under the prescribed mortality scenario, based solely on the reinsurer’s foreknowledge that the prescribed mortality assumption does not allow mortality improvement beyond the valuation date.

B. Determination of a Credit to the NPR to Reflect Reinsurance Ceded

1. Determination of the credit to the NPR to reflect reinsurance shall be done in accordance with SSAP No. 61R—Life, Deposit-Type and Accident and Health Reinsurance in the AP&P Manual.

Guidance Note: The credit taken under a coinsurance arrangement shall be calculated using the same methodology and assumptions used in determining its NPR, but only for the percentage of the risk that was reinsured. If the reinsurance is on a YRT basis, the credit shall be calculated using the assumptions used in determining the NPR, but for the net amount at risk.

2. If a company cedes a portion of a policy under more than one reinsurance agreement, then the company shall calculate a credit separately for each such agreement. The credit for reinsurance ceded for the policy shall be the sum of the credits for all such agreements.
3. The credit for reinsurance ceded applied to a group of policies shall be the sum of the credit for reinsurance ceded for each of the policies of the group.

C. Reflection of Reinsurance Cash Flows in the Deterministic Reserve or Stochastic Reserve

In calculations of the deterministic reserve or stochastic reserve pursuant to Section 4 and Section 5:

1. The company shall use anticipated experience assumptions and margins that are appropriate for each company pursuant to a reinsurance agreement. In such instance, the ceding and assuming companies are not required to use the same assumptions and margins for the reinsured policies unless they are affiliated.
2. To the extent that a single deterministic valuation assumption for risk factors associated with certain provisions of reinsurance agreements will not adequately capture the risk, the company shall do one of the following:

- a. Stochastically model the risk factors directly in the cash-flow model when calculating the stochastic reserve.
- b. Perform a separate stochastic analysis outside the cash-flow model to quantify the impact on reinsurance cash flows to and from the company. The company shall use the results of this analysis to adjust prudent estimate assumptions or to determine an amount to adjust the stochastic reserve to adequately make provision for the risks of the reinsurance features.

Guidance Note: An example of reinsurance provisions where a single deterministic valuation assumption will not adequately capture the risk is stop-loss reinsurance.

3. The company shall determine cash flows for reinsurance ceded subject to the following:
 - a. The company shall include the effect of projected cash flows received from or paid to assuming companies under the terms of ceded reinsurance agreements in the cash flows used in calculating the deterministic reserve in Section 4 and stochastic reserves in Section 5.
 - b. If cash flows received from or paid to assuming companies under the terms of any reinsurance agreement are dependent upon cash flows received from or paid to assuming companies under other reinsurance agreements, the company shall first determine reinsurance cash flows for reinsurance agreements with no such dependency and then use the reinsurance cash flows from these independent agreements to determine reinsurance cash flows for the remaining dependent agreements.
 - c. The company shall use prudent estimate assumptions to project cash flows to and from assuming companies that are consistent with other assumptions used by the company in calculating the deterministic or stochastic reserve for the reinsured policies and that reflect the terms of the reinsurance agreements.
4. The company shall determine cash flows for reinsurance assumed subject to the following:
 - a. The company shall include the effect of cash flows projected to be received from and paid to ceding companies under the terms of assumed reinsurance agreements in the cash flows used in calculating the deterministic reserve in Section 4 and the stochastic reserve in Section 5.
 - b. If cash flows received from or paid to ceding companies under the terms of any reinsurance agreement are dependent upon cash flows received from or paid to ceding companies under other reinsurance agreements, the company shall first determine reinsurance cash flows for reinsurance agreements with no such dependency and then use the reinsurance cash flows from these independent agreements to determine reinsurance cash flows for the remaining dependent agreements.
5. If a company assumes a policy under more than one reinsurance agreement, then the company may treat each agreement separately for the purposes of calculating the reserve.
6. An assuming company shall use assumptions to project cash flows to and from ceding companies that reflect the assuming company's experience for the business segment to which the reinsured policies belong and reflect the terms of the reinsurance agreement.
7. The company shall assume that the counterparties to a reinsurance agreement are knowledgeable about the contingencies involved in the agreement and likely to exercise the terms of the agreement to their respective advantage, taking into account the context of

the agreement in the entire economic relationship between the parties. In setting assumptions for the reinsurance cash flows, the company shall include, but not be limited to, the following:

- a. The usual and customary practices associated with such agreements.
- b. Past practices by the parties concerning the changing of terms, in an economic environment similar to that projected.
- c. Any limits placed upon either party's ability to exercise contractual options in the reinsurance agreement.
- d. The ability of the direct-writing company to modify the terms of its policies in response to changes in reinsurance terms.
- e. Actions that might be taken by a party if the counterparty is in financial difficulty.

Guidance note: It should be assumed that if any treaty produces a pattern of projected losses to the counter party, that the risk of financial difficulty will increase commensurate with the magnitude of projected losses. The risk of default by the assuming company is addressed in item 14 below. The risk of default by the ceding company is addressed in item 15 below.

8. The company shall account for any actions that the ceding company and, if different, the direct-writing company have taken or are likely to take that could affect the expected cash flows of the reinsured business in determining prudent estimate assumptions for the modeled reserve.
- ~~9.~~ Note that these assumptions are in addition to, rather than in lieu of, assumptions as to the behavior of the underlying policyholders.

Guidance Note: Examples of NGE actions the direct-writing company could take include: 1) instituting internal replacement programs or special underwriting programs, both of which could change expected mortality rates; or 2) changing NGE in the reinsured policies, which could affect mortality, policyholder behavior, and possibly expense and investment assumptions. Examples of actions the ceding company could take include: 1) the exercise of contractual options in a reinsurance agreement to influence the setting of NGEs in the reinsured policies; or 2) the ability to participate in claim decisions.

- ~~10.9.~~ The company shall account for any actions that the assuming company has taken or is likely to take that could affect the expected cash flows of the reinsured business
- ~~11.~~ in determining prudent estimate assumptions. Appropriate assumptions for these elements may depend on the scenario being tested. The company shall take into account all likely consequences of the assuming company changing an element of the reinsurance agreement, including any potential impact on the probability of recapture by the ceding company.

Guidance Note: Examples of such actions include, but are not limited to, changes to the current scale of reinsurance premiums and changes to expense allowances.

10. In addition to exercising the terms of the agreement and implementing changes to an agreement, it is appropriate for the actuary to assume that knowledgeable counterparties may renegotiate terms of the agreement to the mutual benefit of both parties or to reflect risk sharing of adverse experience. To the extent that experience is limited in deriving the terms of a renegotiated agreement, or the timing of such renegotiation, the sensitivity tests required in Section 9.A.6.d are required to inform the selection of the assumption set at the conservative end of the plausible range.

~~12~~.11. The company shall take into account any ceding company option to recapture reinsured business. Appropriate assumptions may depend on the scenario being tested (analogous to interest-sensitive lapses).

Guidance Note: Cash flows associated with recapture include recapture fees or other termination settlements.

Guidance Note: To the extent that experience is limited in determining the timing of recapture, the sensitivity tests required in Section 9.A.6.d are required to inform the selection of the assumption set at the conservative end of the plausible range.

Guidance Note: The actions assumed by counterparties with respect to exercising treaty provisions need not all be modeled as some will be mutually exclusive. Exercise of treaty provisions shall be considered and discussed in the PBR actuarial Report.

~~13~~.12. The company shall take into account an assuming company's right to terminate in-force reinsurance business. In the case in which the assuming company's right to terminate is limited to cases of non-payment of amounts due by the ceding company or other specific, limited circumstances, the company may assume that the termination option would be expected to have insignificant value to either party and, therefore, may exclude recognition of this right to terminate in the cash-flow projections. However, if a reinsurance agreement contains other termination provisions with material impact, the company shall set appropriate assumptions for these provisions consistent with the particular scenario being tested.

Guidance Note: To the extent that experience is limited in determining the timing of contract termination, the sensitivity tests required in Section 9.A.6.d are required to inform the selection of the assumption set at the conservative end of the plausible range.

~~14~~.13. If, under the terms of the reinsurance agreement, some of the assets supporting the reserve are held by the counterparty or by another party, the company shall:

- a. Consider the following in order to determine whether to model such assets for purposes of projecting cash flows:
 - i. The degree of linkage between the portfolio performance and the calculation of the reinsurance cash flows.
 - ii. The sensitivity of the valuation result to the asset portfolio performance.
- b. If the company concludes that modeling is unnecessary, document the testing and logic leading to that conclusion.
- c. If the company determines that modeling is necessary, comply with the requirements in Section 7.E and Section 9.F, taking into account:
 - i. The investment strategy of the company holding the assets, as codified in the reinsurance agreement or otherwise based on current documentation provided by that company.
 - ii. Actions that may be taken by either party that would affect the net reinsurance cash flows (e.g., a conscious decision to alter the investment strategy within the guidelines).

Guidance Note: In some situations, it may not be necessary to model the assets held by the other party. An example would be modeling by an assuming company of a reinsurance

agreement containing provisions, such as experience refund provisions, under which the cash flows and effective investment return to the assuming company are the same under all scenarios.

Guidance Note: Special considerations for modified coinsurance: Although the modified coinsurance (ModCo) reserve is called a reserve, it is substantively different from other reserves. It is a fixed liability from the ceding company to the assuming company in an exact amount, rather than an estimate of a future obligation. The ModCo reserve is analogous to a deposit. This concept is clearer in the economically identical situation of funds withheld. Therefore, the value of the modified coinsurance reserve generally will not have to be determined by modeling. However, the projected ModCo interest may have to be modeled. In many cases, the ModCo interest is determined by the investment earnings of an underlying asset portfolio, which, in some cases, will be a segregated asset portfolio or in others the ceding company's general account. Some agreements may use a rate not tied to a specific portfolio.

- ~~15.14.~~ If a ceding company has knowledge that an assuming company is financially impaired, the ceding company shall establish a margin for the risk of default by the assuming company. In the absence of knowledge that the assuming company is financially impaired, the ceding company shall review the projected future profitability (after consideration of the assuming and ceding company actions modeled) of each group of reinsurance agreements by assuming company and establish a margin for the risk of default by the assuming company that is a function of the profitability of those agreements.
- ~~16.15.~~ If an assuming company has knowledge that a ceding company is financially impaired, the assuming company shall establish a margin for the risk of default by the ceding company. Such margin may be reduced or eliminated if the assuming company has a right to terminate the reinsurance upon non-payment by the ceding company. In the absence of knowledge that a ceding company is financially impaired, the assuming company is not required to establish a margin for the risk of default by the ceding company.
- ~~17.16.~~ In setting any margins required by Section 8.C.14 and Section 8.C.15 to reflect potential uncertainty regarding the receipt of cash flows from a counterparty, the company shall take into account the ratings, RBC ratio or other available information related to the probability of the risk of default by the counterparty, as well as any security or other factor limiting the impact on cash flows.

D. Determination of a Pre-Reinsurance-Ceded Minimum Reserve

1. The minimum reserve pursuant to Section 2 is a post-reinsurance-ceded minimum reserve. The company also shall calculate a pre-reinsurance-ceded reserve as specified in Section 8.D.2 below, for financial statement purposes where such a pre-reinsurance-ceded amount is required. Similarly, where a reserve credit for reinsurance may be required, the credit for reinsurance ceded shall be the pre-reinsurance-ceded minimum reserve, minus the minimum reserve (post-reinsurance-ceded). This credit may be negative. Note that due allowance for reasonable approximations may be used where appropriate.
2. The pre-reinsurance-ceded minimum reserve shall be calculated pursuant to the requirements of VM-20, using methods and assumptions consistent with those used in calculating the minimum reserve, but excluding the effect of ceded reinsurance.
 - d. If, on a pre-reinsurance-ceded basis, a group of policies is not able to pass the exclusion tests pursuant to Section 6, then the required deterministic or stochastic

reserves shall be calculated in determining the pre-reinsurance-ceded minimum reserve, even if not required for the minimum reserve.

- e. The company shall use assumptions that represent company experience in the absence of reinsurance—for example, assuming that the business was managed in a manner consistent with the manner that retained business is managed—when computing such exclusion tests and reserves.
- f. The requirement in Section 7.D.3 regarding the 98% to 102% collar does apply when determining the amount of starting assets excluding the effect of ceded reinsurance.

Appendix 2 – APF 2019-41 Revised Language (clean)

VM-20 Section 8.C [Strike the following language]

~~For policies issued on or after Jan. 1, 2020, and optionally for policies issued on or after Jan. 1, 2017, and before Jan. 1, 2020:~~

~~For non-guaranteed YRT reinsurance ceded or assumed, the cash flow modeling requirements in Sections 8.C.1 through 8.C.14 below do not apply since non-guaranteed YRT reinsurance ceded or assumed does not need to be modeled; see Section 8.C.18 below. YRT shall include other reinsurance arrangements that are similar in effect to YRT.~~

~~18. For policies issued on or after Jan. 1, 2020, and optionally for policies issued on or after Jan. 1, 2017, and before Jan. 1, 2020:~~

~~When the reinsurance ceded or assumed is on a non-guaranteed YRT or similar basis, the corresponding reinsurance cash flows do not need to be modeled. Rather, for a ceding company, the post-reinsurance ceded DR or SR shall be the pre-reinsurance ceded DR or SR pursuant to Section 8.D.2, plus any applicable provision pursuant to Section 8.C.15 and Section 8.C.17, minus the NPR reinsurance credit from Section 8.B. For an assuming company, the DR or SR for the business assumed on a non-guaranteed YRT or similar basis shall be set equal to the NPR from Section 3.B.8, plus any applicable provision pursuant to Section 8.C.16 and Section 8.C.17. In the case where there are also other reinsurance arrangements that are not on a non-guaranteed YRT or similar basis, the reinsurance credit shall include the modeled reinsurance credit reflecting those other reinsurance arrangements. In particular, where there are also other reinsurance arrangements that are dependent on the non-guaranteed YRT or similar arrangements, actuarial judgment shall be used to project cash flows consistent with the above-outlined treatment for non-guaranteed YRT or similar arrangements.~~

Guidance Note: ~~The above method is an interim approach. A longer-term solution to YRT is intended to be adopted by state insurance regulators, after state insurance regulators and industry have had additional time to consider and evaluate the variety of approaches that have been put forward as potential longer-term solutions.~~

VM-20 Section 8.C.8 [New section; insert after 8.C.7; renumber subsequent sections]

8. The company shall use best estimate assumptions with no implicit or explicit margins, except margins pursuant to Section 8.C.16 through Section 8.C.18 [after renumbering subsequent sections; or, 8.C.15 through 8.C.15 in the current 2020 VM], as the prudent estimate assumptions for YRT reinsurance premiums paid and YRT reinsurance claim settlements received, using the following procedure:
 - a. Use the reinsurance rates and provisions from the relevant reinsurance agreement as the initial prudent estimate assumption for YRT reinsurance premiums paid, and project future reinsurance rate increases and recaptures using what the company actually expects will occur, based on treaty provisions, past reinsurance rate increase experience, and ongoing relationship with the reinsurer.
 - b. The mortality rates used to determine the prudent estimate assumptions for YRT reinsurance claim settlements shall equal the company's anticipated experience assumptions adjusted to reflect the company's best estimate of mortality improvement.

Appendix 3 – APF 2019-42 Revised Language (clean)

VM-20 Section 8.C [Strike the following language]

~~For policies issued on or after Jan. 1, 2020, and optionally for policies issued on or after Jan. 1, 2017, and before Jan. 1, 2020:~~

~~For non-guaranteed YRT reinsurance ceded or assumed, the cash flow modeling requirements in Sections 8.C.1 through 8.C.14 below do not apply since non-guaranteed YRT reinsurance ceded or assumed does not need to be modeled; see Section 8.C.18 below. YRT shall include other reinsurance arrangements that are similar in effect to YRT.~~

VM-20 Section 8.C.18 [Replace Section]

18. When projecting non-guaranteed future reinsurance features, the company shall use prudent estimate reinsurance premiums in projecting the reinsurance cash flows. The company shall project reinsurance cash flows pursuant to all provisions within a reinsurance agreement and shall determine the prudent estimate reinsurance premiums using the following procedure:
- a. Use the reinsurance rates and provisions from the relevant reinsurance agreement as the anticipated experience assumption for reinsurance, subject to any modifications in Section 8.C.18.c. No margin is required for years in which the reinsurance features are guaranteed. For years when reinsurance features are not guaranteed, Section 8.C.18.b below sets forth the prescribed reinsurance premium margin.

<p>Guidance Note: While the most commonly considered non-guaranteed reinsurance feature is future YRT premium rates, other non-guaranteed features are also to be considered, such as non-guaranteed expense allowances.</p>

- b. Set the reinsurance premium margin equal to λ times the reinsurance premium rate, where $\lambda = [(i) - (ii)]$ divided by (ii), in which (i) and (ii) are described below.
 - i. “Baseline credibility” prudent estimate mortality, i.e., prudent estimate mortality following Section 9.C.1 through Section 9.C.7, but recalculated (1) with the margins determined under Section 9.C.6.b modified to reflect a credibility percentage equal to the greater of the one originally determined pursuant to Section 9.C.5 and 80% and (2) with grading modified to reflect a value of D equal to the greater of the one originally determined pursuant to Section 9.C.7.b.ii and 10 years.
 - ii. Company experience mortality as provided in Section 9.C.2, but recalculated including mortality improvement for [*Separately test 5, 10, 15 and 20*] years beyond the valuation date. Mortality improvement rates shall equal the mortality improvement rates of Section 9.C.3.g, whether or not the company chose to apply mortality improvement to the industry basic mortality table.

Guidance Note: Simplifications or approximations to estimate the effect of the “baseline credibility” prudent estimate mortality in Section 8.C.18.b.i are permissible if they comply with VM-20 Section 2.G.

For example, in situations where the value of D originally determined pursuant to Section 9.C.7.b.ii was greater than or equal to 10 years, there is a simple approximation. Separately for the 2008 VBT limited underwriting, the 2015 VBT using Limited Fluctuation, and the 2015 VBT using Bühlmann, for a given credibility percentage, X%, the ratio of the margin with X% credibility to the margin with 80% credibility is fairly stable across all attained ages. Thus, the effect of the baseline credibility can be approximated by calculating λ' by following Section 8.C.18.b using prudent estimate mortality rather than “baseline credibility” prudent estimate mortality and then obtaining λ by multiplying λ' by $\Theta/100$ in durations prior to when grading begins, by $(100 + \Theta)/200$ in the grading durations, and by 1.0 in durations after grading is complete, where Θ is:

Θ Values

Credibility	Industry Table = 2015 VBT		Industry Table = 2008 VBT LU
	Bühlmann	Limited Fluctuation	
20%-22%	50	33	39
23%-27%	51	37	39
28%-32%	53	40	39
33%-37%	55	44	39
38%-39%	57	48	39
40%-42%	57	48	64
43%-47%	60	53	64
48%-52%	63	58	64
53%-57%	67	64	64
58%-59%	71	69	64
60%-62%	71	69	86
63%-67%	76	76	86
68%-72%	82	83	86
73%-77%	89	92	86
78%-79%	100	100	86
80%+	100	100	100

Guidance Note: In the case where applicable industry tables are used in lieu of company experience, Section 8.C.18.b.i would be the industry tables, but using company experience margins corresponding to the baseline 80% credibility and grading corresponding to a sufficient data period of 10, graded into that same industry table with industry margins. Similarly, Section 8.C.18.b.ii would be the industry tables, with future mortality improvement applied using the mortality improvement rates in Section 9.C.3.g.

- c. Reinsurance premium prudent estimate assumptions may be modified if, in the company's judgment, the prescribed reinsurance premium prudent estimate assumptions do not appropriately reflect the expected reinsurance premium experience under a moderately adverse scenario. In cases where the reinsurance premium prudent estimate assumptions are modified, the modifications must not result in reinsurance premium anticipated experience assumptions that are lower than those prescribed in Section 8.C.18.a or reinsurance premium margins that are lower than those prescribed in Section 8.C.18.b without prior approval by the domiciliary commissioner. Note that if the reinsurance agreement allows for the ceding company to recapture the ceded business if the reinsurer raises rates, the ceding company may model this explicitly or limit prudent estimate reinsurance premiums such that they do not exceed the prudent estimate mortality following Section 9.C.1 through Section 9.C7, and this modification would not require commissioner approval.

Guidance Note: Examples of reasons to modify the reinsurance premium prudent estimate assumptions include, but are not limited to, counterparty default concerns, reinsurance contract language that contains particularly restrictive or permissive provisions regarding reinsurance rate increases, and potential recapture of the reinsured business.

Appendix 4 – Model Prep Instructions (sent 10/22/19)



20191022 YRT Field
Test - Participant Mod

YRT Field Test for PBR/VM-20

Participant Model Prep Instructions

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Introduction

Thank you for agreeing to participate in the YRT Reinsurance Field Test for PBR/VM-20 (field test). Your participation is critical to the success of the field test. Anonymized field test results will be used to inform regulators as they work to resolve the issue of how companies should determine the YRT reinsurance reserve credit for VM-20 modeled reserves.

Timeframe

The timeframe for your participation in the field test is as follows:

Mid October	<ul style="list-style-type: none">• Participants receive model prep instructions containing guidance on preparing their baseline models for the field test.
Early November	<ul style="list-style-type: none">• Participants receive field test instructions for using their baseline models to perform focused testing of three potential long-term APF solutions.• Participants receive a brief survey to collect information on how they intend to model three potential long-term APF solutions.
Mid November	<ul style="list-style-type: none">• Participants receive an output template for collecting and submitting field test results.
End of December	<ul style="list-style-type: none">• Completed output template due to the Academy.• Since some participants may be new to the nested modeling needed to project VM-20 reserves, late submissions of projected reserves will be accepted until the end of February.

Background

In its 2017 reviews of Life PBR Actuarial Reports, the NAIC's Valuation Analysis (E) Working Group (VAWG) found that modeling of YRT reinsurance premiums varied significantly across companies. As a result, alternative Amendment Proposal Forms (APFs) have been proposed for additional consistency in this area. The NAIC's Life Actuarial (A) Task Force (LATF) would like to see results of a field test of these APFs to inform its consideration of which, if any, of the APFs to adopt.

The field test is being designed jointly by the Academy, the NAIC, and the American Council of Life Insurers (ACLI). Field test responses will be handled initially by Steve Jackson, assistant director for research (public policy) at the Academy, who will be responsible for ensuring the confidentiality of individual company information. After execution of appropriate nondisclosure agreements, confidential information, including company names, may be provided to a third-party consultant, to NAIC and ACLI staff, and to state regulators. Aggregated, anonymized results will be shared with the Academy, NAIC and ACLI staff, Academy committee members, and each participant in the field test.

Goals

Goals for the field test include the following:

1. Compare Yearly Renewable Term (YRT) reinsurance reserve/credit differences by company, cedant/reinsurer perspective, product type, and treaty type for potential long-term solutions

and the one half of the one-year mean reserve using the valuation mortality table ($\frac{1}{2}$ Cx) baseline;

2. Increase confidence in the reasonableness of assumptions used and YRT premiums/claims projected;
3. Gather insight into the sources of deviation between the solutions being considered;
4. Better understand how reinsurance is modeled, modeling complexities, intended/unintended outcomes, and differences due to company size/credibility/inforce; and
5. Quantify the impact of treaty types on cedant mortality margins, including the explicit credibility-linked margin, and the implicit margin from prohibiting future mortality improvement.

Preparing Your Models

Two Baseline Approaches

Prepare your models by testing two baseline approaches for determining the YRT reinsurance reserve credit:

- Baseline 1: The current $\frac{1}{2}$ Cx interim solution
 - There is no need to project cashflows for determining post-reinsurance modeled reserves, which are simply equal to pre-reinsurance modeled reserves less $\frac{1}{2}$ cx.
- Baseline 2: No change to current YRT premiums
 - When projecting cashflows to determine post-reinsurance modeled reserves, assume current YRT premiums do not change over the course of the projection.

Key Modeling Capabilities

Key model capabilities for the field test will include:

1. Calculating time-zero VM-20 reserves
 - a. for currently (or soon to be) sold products subject to reinsurance
2. Projecting VM-20 reserves
 - a. If possible, use a model that can project reserves at periodic intervals. If such a model is not available, consider using a pricing model, business forecasting projection model, or cash flow testing model.
3. Modeling the YRT reinsurance treaty structures
 - a. Treaties your company currently has in place
4. Modeling sensitivities
 - a. including changes to the mortality assumption, non-guaranteed YRT reinsurance premium rates and YRT reinsurance claim recoveries
5. Modeling future mortality improvement

Valuation Date

The time zero valuation date assumed for the field test will be 12/31/18. Note that the Treasury yield curve on 12/31/18 is as follows:

Maturity (years)	0.25	0.5	1	2	3	5	7	10	20	30
Treasury Yield	2.45%	2.56%	2.63%	2.48%	2.46%	2.51%	2.59%	2.69%	2.87%	3.02%

Valuation Manual

Models and methodology used for the field test should follow the 2020 Valuation Manual unless directed otherwise in the field test instructions. Make note of any areas where models and methodology are not in compliance with the 2020 Valuation Manual.

Reinsurance

The only difference between the pre-YRT-reinsurance and post-YRT-reinsurance results produced by your models should be YRT reinsurance. Different approaches for accomplishing this could include: (a) model no reinsurance for the pre-YRT-reinsurance results and only model YRT type reinsurance for the post-YRT-reinsurance results, or (b) model other types of reinsurance (e.g. coinsurance) for both the pre-YRT-reinsurance and the post-YRT-reinsurance results.

Inforce

Time zero inforce should consist of 12 months of policy issues that have been (or are contemplated to be) valued under PBR. Only include policies subject to YRT reinsurance. Only include policies in the Term and ULSG reserving categories as defined by VM-20. If such an actual inforce population is not available, use an appropriate mix of PBR pricing cells based on 12 months of issues.

General Nested Modeling Guidance (i.e. inner and outer loop projections)

In addition to the small amount of inner/outer loop modeling guidance below, participants are encouraged to familiarize themselves with the Academy's PBR Projections Practice Note. The initial exposure draft of the practice note is expected to be published soon. Participants will be notified once the exposure draft has been posted at the Academy's website.

Inner Loop Projections

1. An inner loop projection projects cashflows forward from a valuation date, and those cashflows are only used to determine the deterministic reserve (DR) and stochastic reserve (SR) on that valuation date.
2. If possible, for each inner loop projection project cashflows until no liabilities remain.
3. Use VM-20 prescribed and prudent estimate assumptions.
4. Use a separate inner loop projection for each valuation date in the outer loop, $t = 0, 1, 2, \dots$
 - a. For each valuation date, use assumptions that comply with VM-20 and are consistent with the "state of the world" on that valuation date as defined by the outer loop at that point.

- b. Prudent estimate assumptions for each inner loop projection reflect any projected increases in the credibility of company experience from one valuation date to the next.
- c. The prudent estimate mortality assumption for each inner loop projection reflects any projected increases in the sufficient data period from one valuation date to the next.
- d. Assume a constant mean reversion parameter for the prescribed ESG. This combined with the constant yield curve assumed for the outer loop, means VM-20 scenarios for each inner loop projection are not regenerated, i.e. inner loop scenarios are the same for time zero and every future valuation date.
- e. Current spreads for each inner loop projection are equal to spreads in the outer loop on the valuation date.

Outer Loop Projections

1. Assume 0.5% future mortality improvement for the outer loop
2. Outer loop experience assumptions
 - a. Set equal to unmargined (i.e. anticipated) experience assumptions from the time zero inner loop projection.
 - b. Assume 2% expense inflation in the outer loop.
3. Outer loop economic and reinvestment assumptions
 - a. Assume the initial yield curve remains constant throughout the outer loop projection.
 - b. Use VM-20 prescribed current spreads and baseline defaults from the time zero inner loop projection. For the outer loop, keep spreads constant, i.e. do not grade to ultimate spreads as you do for the inner loop. For outer loop defaults, ignore the spread related factor and max net spread adjustment.
 - c. Use the inforce portfolio mix from the time zero inner loop projection.
 - d. Use the anticipated company experience reinvestment strategy from time zero.
4. Use separate inner loop projections to calculate reserves at time zero and each projected valuation date

Key Output

Ensure you can capture the following data from your models. An output template to capture this data will be distributed around the same time as the focused field test instructions.

- Pre- and post-reinsurance amounts for calculated VM-20 reserve components (NPR, DR, SR)
- Net Amount At Risk (NAAR) inforce (pre- and post-reinsurance)
- Present value of YRT reinsurance premiums (split by guaranteed and non-guaranteed if possible)
- Present value of YRT reinsurance recoveries
- Credibility level and method (limited fluctuation or Buhlmann)
- Sufficient Data Period (SDP)
- Any additional margin used in prudent estimate mortality assumption (level and reason)

If possible, you will also be able to capture the following projected items from any DR model run:

- NAAR (pre- and post-reinsurance) projected
- Direct gross premiums and claims projected
- YRT reinsurance premiums and recoveries projected

Guidance on Shortcuts

The following table contains suggestions if cuts must be made due to resource constraints and/or modeling limitations. The suggestions are prioritized to limit the impact cuts will have on the goals of the field test. Please be prepared to list and describe any shortcuts, approximations and/or simplifications used in your company's modeling.

<i>1. Try these approximations and simplifications first:</i>	
a. Outer Loop Projections	Project reserves at years 1-5 and every five years afterward (instead of annually)
b. Starting Assets	Scale starting assets within +/-10% (instead of 2% collar)
c. Stochastic Scenarios	Reduce the number of stochastic scenarios to 100 (or even 50)
d. Asset Portfolio	Use a simplified asset mix (e.g., ignore externally projected assets and reduce types of assets in portfolio)
e. Inner Loop Projection Period	For Term, limit each inner loop to a 40-year projection period (or less as deemed appropriate)
f. Expense Inflation	Use company-specific assumption expense inflation rate instead of 2% if needed (as long as both pre & post reinsurance are consistent)
<i>2. Try these if still experiencing resource constraints and/or modeling limitations:</i>	
a. Outer Loop Projections	Project reserves at years 1, 5, 10, 20, 30
b. Product Types	Only provide field test results 20-year Term and ULSG (no IUL/VUL)
c. Stochastic Reserves	Only produce NPR and DR, but not SR
<i>3. Only perform these if unable to complete field testing without them:</i>	
a. Net Premium Reserve	Only produce DR and ½ Cx, not NPR
b. Outer Loop Projections	Only provide projected reserves at timing of expected reserve peak
c. Restrict Treaties	Only select key treaties that are more predominate on Term and ULSG business
d. Forgo Nested Modeling	Forgo nested modeling by just projecting the inner loop and changing the valuation date (only recommended as a last resort)
e. Limit Products	Only provide field test results for the Term and/or ULSG product with largest volume

