Model: Source text
Problem Type: Inuring Experience Rating

Given

Surplus share retention:	$200,000
Excess of Loss Treaty:	100,000 xs 100,000
Expected Loss Ratio:	65%

Exposure Curve

Percent of Insured Value	Exposure Factor
0%	0%
10%	37%
20%	49%
30%	57%
40%	64%
50%	70%
60%	76%
70%	81%
80%	85%
90%	89%
100%	93%
110%	97%
120%	100%

Range of Insured Values ($000)	Midpoint	Insured Value after Surplus Share	Gross Premium	GNEPI
20 - 100	60	?	682,000	?
100 - 250	175	?	161,000	?
250 - 1,000	625	?	285,000	?
1,000 - 2,000	1500	?	1,156,000	?
Grand Total			2,284,000	?

Range of Insured Values ($000)	Net Insured Value	Retention % of Insured Value	Retention + Limit % of Insured Value	Exposure Factor
20 - 100	?	?	?	?
100 - 250	?	?	?	?
250 - 1,000	?	?	?	?
1,000 - 2,000	?	?	?	?

Range of Insured Values ($000)	Subject Premium	Expected Loss Ratio	Expected Losses	Reinsurer's Losses
20 - 100	?	65%	?	?
100 - 250	?	65%	?	?
250 - 1,000	?	65%	?	?
1,000 - 2,000	?	65%	?	?
Grand Total	?		?	?

Find   Calculate the loss cost for the $100,000 excess $100,000 layer net of the surplus share treaty

Solution: Based on the wording of the question, the surplus share treaty inures to the benefit of the excess of loss treaty. The insured retains only the first $200,000 of each loss once the surplus share is applied.

Range of Insured Values ($000)	Midpoint ($000)	(1) Insured Value after Surplus Share	Gross Premium	(2) GNEPI
20 - 100	60	60,000	682,000	682,000
100 - 250	175	175,000	161,000	161,000
250 - 1,000	625	200,000	285,000	91,200
1,000 - 2,000	1500	200,000	1,156,000	154,133
Grand Total			2,284,000	1,088,333

(1) = min(surplus share retention, Midpoint)
(2) = Gross Premium * [(1) / Midpoint]

Range of Insured Values ($000)	(3) Net Insured Value ($000)	(4) Retention % of Insured Value	(5) Retention + Limit % of Insured Value	(6) Exposure Factor
20 - 100	60	167%	333%	0%
100 - 250	175	57%	114%	24%
250 - 1,000	200	50%	100%	23%
1,000 - 2,000	200	50%	100%	23%

(3) = (1)
(4) = Excess of loss retention / (3)
(5) = [Excess of loss retention + limit] / (3)
(6) = P((5)) - P((4)) with linear interpolation used on the exposure curve

Range of Insured Values ($000)	(7) Subject Premium	Expected Loss Ratio	(8) Expected Losses	(9) Reinsurer's Losses
20 - 100	682,000	65%	443,300	0
100 - 250	161,000	65%	104,650	25,116
250 - 1,000	91,200	65%	59,280	13,634
1,000 - 2,000	154,133	65%	100,187	23,043
Grand Total	1,088,333		707,417	61,793

(7) = GNEPI

(8) = (7) * Expected Loss Ratio
(9) = (8) * (6)

The loss cost for the layer $100,000 xs $100,000 is   5.68%
= (Total 9) / (Total 7)

Observe the two highest ranges have the same exposure factor because only one exposure curve was used.

Given

Surplus share retention:	$250,000
Excess of Loss Treaty:	$100,000 xs $150,000
Expected Loss Ratio:	55%

RANDOM

Exposure Curve

Percent of Insured Value	Exposure Factor
0%	0%
10%	9%
20%	28%
30%	38%
40%	41%
50%	46%
60%	49%
70%	71%
80%	81%
90%	86%
100%	88%
110%	97%
120%	100%

Range of Insured Values ($000)	Midpoint	Insured Value after Surplus Share	Gross Premium	GNEPI
10 - 80	45	?	468,000	?
80 - 230	155	?	239,000	?
230 - 1,100	665	?	293,000	?
1,100 - 2,390	1745	?	1,096,000	?
Grand Total			2,096,000	?

Range of Insured Values ($000)	Net Insured Value	Retention % of Insured Value	Retention + Limit % of Insured Value	Exposure Factor
10 - 80	?	?	?	?
80 - 230	?	?	?	?
230 - 1,100	?	?	?	?
1,100 - 2,390	?	?	?	?

Range of Insured Values ($000)	Subject Premium	Expected Loss Ratio	Expected Losses	Reinsurer's Losses
10 - 80	?	55%	?	?
80 - 230	?	55%	?	?
230 - 1,100	?	55%	?	?
1,100 - 2,390	?	55%	?	?
Grand Total	?		?	?

Find Calculate the loss cost for the $100,000 excess $150,000 layer net of the surplus share treaty

Solution: Based on the wording of the question, the surplus share treaty inures to the benefit of the excess of loss treaty. The insured retains only the first $250,000 of each loss once the surplus share is applied.

Range of Insured Values ($000)	Midpoint ($000)	(1) Insured Value after Surplus Share	Gross Premium	(2) GNEPI
10 - 80	45	45,000	468,000	468,000
80 - 230	155	155,000	239,000	239,000
230 - 1,100	665	250,000	293,000	110,150
1,100 - 2,390	1745	250,000	1,096,000	157,020
Grand Total			2,096,000	974,170

(1) = min(surplus share retention, Midpoint)

(2) = Gross Premium * [(1) / Midpoint]

Range of Insured Values ($000)	(3) Net Insured Value ($000)	(4) Retention % of Insured Value	(5) Retention + Limit % of Insured Value	(6) Exposure Factor
10 - 80	45	333%	556%	0%
80 - 230	155	97%	161%	13%
230 - 1,100	250	60%	100%	39%
1,100 - 2,390	250	60%	100%	39%

(3) = (1)

(4) = Excess of loss retention / (3)

(5) = [Excess of loss retention + limit] / (3)

(6) = P((5)) - P((4)) with linear interpolation used on the exposure curve

Range of Insured Values ($000)	(7) Subject Premium	Expected Loss Ratio	(8) Expected Losses	(9) Reinsurer's Losses
10 - 80	468,000	55%	257,400	0
80 - 230	239,000	55%	131,450	17,089
230 - 1,100	110,150	55%	60,583	23,627
1,100 - 2,390	157,020	55%	86,361	33,681
Grand Total	974,170		535,794	74,397

(7) = GNEPI

(8) = (7) * Expected Loss Ratio

(9) = (8) * (6)

The loss cost for the layer $100,000 xs $150,000 is   7.64%

= (Total 9) / (Total 7)

Observe the two highest ranges have the same exposure factor because only one exposure curve was used.