Premium Calculation

Previously, HUD allowed mortgagees to choose from three different premium calculations for risk-based loans. Since the implementation of SFPCS Periodic, premiums are based on HUD's standard calculation which became effective May 1, 1998. There is no tolerance in the amount of the premiums.

Below is the current premium calculation with examples and pseudocode.

Premium Calculation

Periodic MIP Computation Steps	***Example***
Step 1: Compute annual average outstanding balance (see below)	Average Outstanding Balance for 1st amortization year: $106,160.654166666666
Step 2: Average Outstanding Balance * Annual MIP Rate *(round to 2nd decimal place based on value in 3rd decimal place).*	106,160.654166666666 x.005 = 530.803270833333333 *round to 530.80*
Step 3: If MIP financed, divide annual MIP from Step 2 by (1 + Upfront MIP factor) *Result rounded to 2nd decimal place based on value in 3rd decimal place.*	530.80/ (1 + 0.0225) = 519.1198 *round to 519.12*
Step 4: Divide by 12 and round to nearest cent for Monthly MIP. *Result rounded to 2nd decimal place based on value in 3rd decimal place.*	519.12/ 12 = 43.26 *round to 43.26*
Step 5: Multiply by 12. *This is the Annual Premium.*	$519.12

Computation of Annual Average Outstanding Balance

To start, use the original loan amount as the previous balance. Repeat the following steps for the remaining months in the year (11 iterations). The calculation of subsequent years is the same. The second year will begin with the last result of the first year.

a. Multiply previous balance times annual contract interest rate. *Round the result to two (2) decimal places based on value in 3rd decimal place..*

b. Divide result by 1200. *Round the result to two (2) decimal places based on*

the value in 3rd decimal place.

c. Add previous balance.

d. Subtract P&I payment. *Note: For ARMS's use original Interest Rate and original P&I through all years. For GEM/GPM compute current P&I based on amortization plan. See table below.*

When the final year is computed, total up the 12 results for that year and divide the total by 12.

AMPLAN	RATE OF INCREASE	MONTHS OF INCREASE
A	.025	60
B	.050	60
C	.075	60
D	.020	120
E	.030	120
F	.049	120
L	.010	999
M	.020	999
N	.030	999
O	.040	999
P	.050	999

The new monthly P&I for GEM/GPM is not calculated if the twelfth month of the case has not been reached or if the payment number is greater than the maximum number of months.

Premium Calculation Example

Field	***Value***
Original Mortgage Amount	$106,605
Interest Rate	7.5
Monthly P&I	745.40
Annual MIP Rate	0.005
Upfront Factor	0.0225
Beginning Amortization Date	04/1996
Today's Date	12/1997

Compute the annual average outstanding balance:

Month/Year	***Computation***	***Result***
Year 1 / Month 1	*(Use Original Mortgage Amount)*	$106,605.00

Year 1 / Month 2	a. 106,605.00 * 7.5 = 799,537.5000 (round to 799,537.50) b. 799,537.50 / 1200 = 666.28125 (round to 666.28) c. 666.28 + 106,605.00 = 107,271.28 d. 107,271.28 - 745.40 = 106,525.88	$106,525.88
Year 1 / Month 3	a. 106,525.88 * 7.5 = 798,944.1000 (round to 798,944.10) b. 798,944.10 / 1200 = 665.78675 (round to 665.79) c. 665.79 + 106,525.88 = 107,191.67 d. 107,191.67 - 745.40 = 106,446.27	$106,446.27
Year 1 / Month 4	a. 106,446.27 * 7.5 = 798,347.025 (round to 798,347.03) b. 798,347.03 / 1200 = 665.2891916 (round to 665.29) c. 665.29 + 106,446.27 = 107,111.56 d. 107,111.56 - 745.40 = 106,366.16	$106,366.16
Year 1 / Month 5	a. 106,366.16 * 7.5 = 797,746.20 (round to 797,746.20) b. 797,746.20 / 1200 = 664.7885 (round to 664.79) c. 664.79 + 106,366.16 = 107,030.95 d. 107,030.95 - 745.40 = 106,285.55	$106,285.55
Year 1 / Month 6	a. 106,285.55 * 7.5 = 797,141.625 (round to 797,141.63) b. 797,141.63 / 1200 = 664.2847 (round to 664.28) c. 664.28 + 106,285.55 = 106,949.83 d. 106,949.83 - 745.40 = 106,204.43	$106,204.43
Year 1 / Month 7	a. 106,204.43 * 7.5 = 796,533.225 (round to 796,533.23) b. 796,533.23 / 1200 = 663.77769 (round to 663.78) c. 663.78 + 106,204.43 = 106,868.21 d. 106,868.21 - 745.40 = 106,122.81	$106,122.81
Year 1 / Month 8	a. 106,122.81 * 7.5 = 795,921.075 (round to 795,921.08) b. 795,921.08/ 1200 = 663.2675666 (round to 663.27) c. 663.267+ 106,122.81 = 106,786.08 d. 106,786.08 - 745.40 = 106,040.68	$106,040.68
Year 1 / Month 9	a. 106,040.68 * 7.5 = 795,305.10 (round to 795,305.10) b. 795,305.10 / 1200 = 662.75425 (round to 662.75) c. 662.75 + 106,040.68 = 106,703.43 d. 106,703.43 - 745.40 = 105,958.03	$105,958.03
Year 1 / Month 10		$105,874.87

	a. 105,958.03 * 7.5 = 794,685.225 (round to 794,685.23) b. 794,685.23 / 1200 = 662.2376916 (round to 662.24) c. 662.234+ 105,958.03 = 106,620.27 d. 106,620.27 - 745.40 = 105,874.87	
Year 1 / Month 11	a. 105,874.87 * 7.5 = 794,061.525 (round to 794,061.53) b. 794,061.53 / 1200 = 661.7179416 (round to 661.72) c. 661.72 + 105,874.87 = 106,536.59 d. 106,536.59 - 745.40 = 105,791.19	$105,791.19
Year 1 / Month 12	a. 105,791.19 * 7.5 = 793,433.925 (round to 793,433.93) b. 793,433.93 / 1200 = 661.19494 (round to 661.19 c. 661.19 + 105,791.19 = 106,452.38 d. 106,452.38 - 745.40 = 105,706.98	$105,706.98

Total of the Year 1 results	$1,273,927.85
Divided by 12 *This is the Annual Average Outstanding Balance* *See Premium Calculation table at beginning of document for remaining steps to calculate Year 1 premium*	$106,160.654166666666

Year 2 / Month 1	a. 105,706.98 * 7.5 = 792,802.3500 b. 792,802.35 / 1200 = 660.668625 c. 660.67 + 105,706.98 = 106,367.65 d. 106,367.65 - 745.40 = 105,622.25	$105,622.25
Year 2 / Month 2	a. 105,622.25 * 7.5 = 792,166.8750 b. 792,166.88 / 1200 = 660.139066 c. 660.14 + 105,622.25 = 106,282.39 d. 106,282.39 - 745.40 = 105,536.99	$105,536.99
Year 2 / Month 3	a. 105,536.99 * 7.5 = 791,527.4250 b. 791,527.43 / 1200 = 659.60619 c. 659.61 + 105,536.99 = 106,196.60 d. 106,196.60 - 745.40 = 105,451.20	$105,451.20
Year 2 / Month 4	a. 105,451.20 * 7.5 = 790,884.000 b. 790,884.00 / 1200 = 659.07000	$105,364.87

	c. 659.07 + 105,451.20 = 106,110.27 d. 106,110.27 - 745.40 = 105,364.87	
Year 2 / Month 5	a. 105,364.87 * 7.5 = 790,236.5250 b. 790,236.53 / 1200 = 658.53041 c. 658.53 + 105,364.87 = 106,023.40 d. 106,023.40 - 745.40 = 105,278.00	$105,278.00
Year 2 / Month 6	a. 105,278.00 * 7.5 = 789,585.0000 b. 789,585.00 / 1200 = 657.987500 c. 657.99 + 105,278.00 = 105,935.99 d. 105,935.99 - 745.40 = 105,190.59	$105,190.59
Year 2 / Month 7	a. 105,190.59 * 7.5 = 788,929.4250 b. 788,929.43 / 1200 = 657.441191 c. 657.44 + 105,190.59 = 105,848.03 d. 105,848.03 - 745.40 = 105,102.63	$105,102.63
Year 2 / Month 8	a. 105,102.63 * 7.5 = 788,269.72500 b. 788,269.73 / 1200 = 656.891441 c. 656.89 + 105,102.63 = 105,759.52 d. 105,759.52 - 745.40 = 105,014.12	$105,014.12
Year 2 / Month 9	a. 105,014.12 * 7.5 = 787,605.9000 b. 787,605.00 / 1200 = 656.338250 c. 656.34 + 105,014.12 = 105,670.46 d. 105,670.46 - 745.40 = 104,925.06	$104,925.06
Year 2 / Month 10	a. 104,925.06 * 7.5 = 786,937.95000 b. 786,936.95 / 1200 = 655.781625 c. 655.78 + 104,925.06 = 105,580.84 d. 105,580.84 - 745.40 = 104,835.44	$104,835.44
Year 2 / Month 11	a. 104,835.44 * 7.5 = 786,265.80000 b. 786,265.80 / 1200 = 655.221500 c. 655.22 + 104,835.44 = 105,490.66 d. 105,490.66 - 745.40 = 104,745.26	$104,745.26
Year 2 / Month 12	a. 104,745.26 * 7.5 = 785,589.45000 b. 785,588.45 / 1200 = 654.657875 c. 654.66 + 104,745.26 = 105,399.92 d. 105,399.92 - 745.40 = 104,654.52	$104,654.52

Total of the Year 2 results	$1,261,720.93
Divided by 12 *This is the Annual Average Outstanding Balance*	$105,143.410833333333
Multiplied by the Annual MIP Rate (.005)	$525.7170541667
Rounded to two (2) decimal places	$525.72
Divided by 1 + Upfront MIP Factor (1 + .0225)	$514.1515892421

Rounded to two (2) decimal places	$514.15
Divided by 12	$42.8458333333
Rounded to two (2) decimal places *This is the Monthly MIP*	$42.85
Multiply Monthly MIP by 12 *This is the Annual MIP*	$514.20

Pseudocode

Input Values

interest = Interest Rate

mip = Annual MIP Rate

months = Years Since Amortization Date * 12

orig_mtg = Original Mortgage Amount

p_i = Monthly Principal & Interest

upfront = Upfront MIP Factor

hold_val = A variable to store intermittent results

total_amt = A variable to sum the last 12 months

```
BEGIN
  last_val = orig_mtg
  total_amt = last_val
  FOR (I = 2 TO months)
      hold_val = last_val * interest
      [ROUND hold_val to 2 places after the decimal]
      hold_val = hold_val / 1200
      [ROUND hold_val to 2 places after the decimal]
      hold_val = hold_val + last_val
      hold_val = hold_val - p_i
      last_val = hold_val
      total_amt = total_amt + last_val
      IF (REMAINDER(I / 12) = 0) AND (I <> months) THEN
        total_amt = 0
```

```
      END IF
   NEXT I
   total_amt = total_amt / 12
   total_amt = total_amt * mip
   [ROUND total_amt to 2 places after the decimal]
   total_amt = total_amt / (1 + upfront)
   [ROUND total_amt to 2 places after the decimal]
   total_amt = total_amt / 12
   [ROUND total_amt to 2 places after the decimal]
   PRINT:  Monthly Premium = total_amt
END
```

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