

**EXH. JJS-3
DOCKETS UE-19 ___/UG-19 ___
2019 PSE GENERAL RATE CASE
WITNESS: JOHN J. SPANOS**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

**Docket UE-19 ___
Docket UG-19 ___**

**SECOND EXHIBIT (NONCONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF**

JOHN J. SPANOS

ON BEHALF OF PUGET SOUND ENERGY

JUNE 20, 2019



2018 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
FOR COLSTRIP UNITS 3 AND 4
AS OF DECEMBER 31, 2018

Prepared by:



Gannett Fleming

*Excellence Delivered **As Promised***

PUGET SOUND ENERGY

COLSTRIP UNITS 3 AND 4 DEPRECIATION RATES

EXECUTIVE SUMMARY

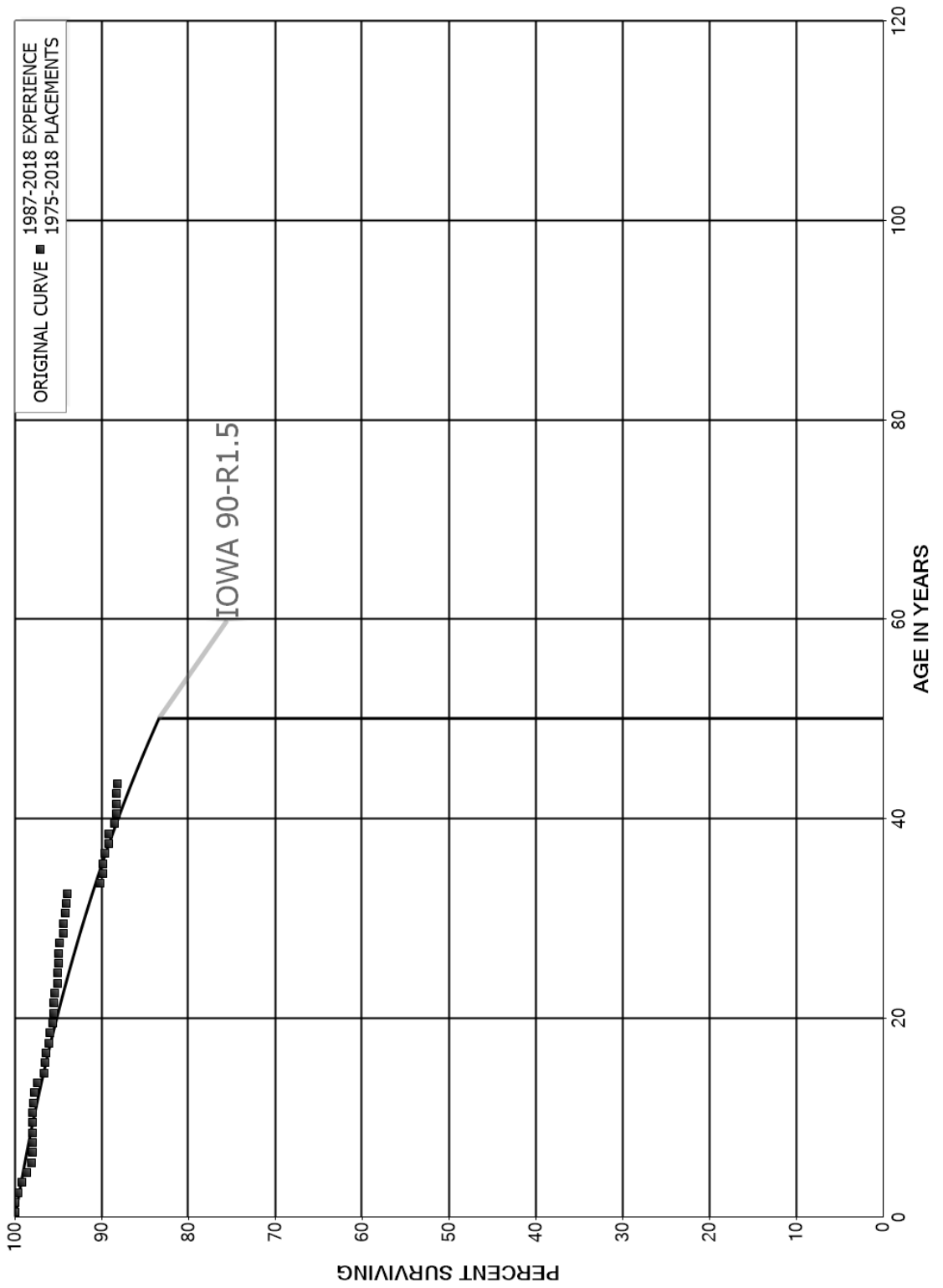
Pursuant to Puget Sound Energy's ("PSE" or "Company") request, Gannett Fleming Valuation and Rate Consultants, LLC ("Gannett Fleming") conducted a depreciation study for Colstrip Units 3 and 4 and related common facilities. The purpose of this study was to determine the annual depreciation accrual rates and amounts for book and ratemaking purposes based on the current outlook for the facility.

The depreciation rates determined as a result of this study are based on the straight-line method using the average service life ("ASL") procedure and were applied on a remaining life basis. The calculations were based on attained ages and estimated average service life and net salvage for each depreciable group of assets.

In April 2019, the Washington State legislature passed Senate Bill 5116. One of the requirements of this bill is that "[o]n or before December 31, 2025, each electric utility must eliminate coal-fired resources from its allocation of electricity." The Company's currently approved depreciation rates for Colstrip Units 3 and 4 incorporate a probable retirement date of December 2027. Because Senate Bill 5116 requires the elimination of coal-fired resources by December 2025, the depreciation rates for Colstrip Units 3 and 4 need to be updated to incorporate a retirement date of December 2025. In addition to updating the retirement date for these units, the terminal net salvage estimates have been updated to incorporate current estimates of retirement costs. The method by which these costs have been incorporated into the net salvage estimates is the same as used in the

previous depreciation study. Interim survivor curves and interim net salvage estimates were also reviewed based on current data and were modified as appropriate.

Gannett Fleming recommends the calculated annual depreciation accrual rates set forth herein apply specifically to Colstrip Units 3 and 4 as summarized in Table 1 of the study. Supporting analysis and calculations are provided within the study. The study results set forth an annual depreciation expense of \$39.8 million when applied to depreciable plant balances as of December 31, 2018.



PLACEMENT BAND 1975-2018

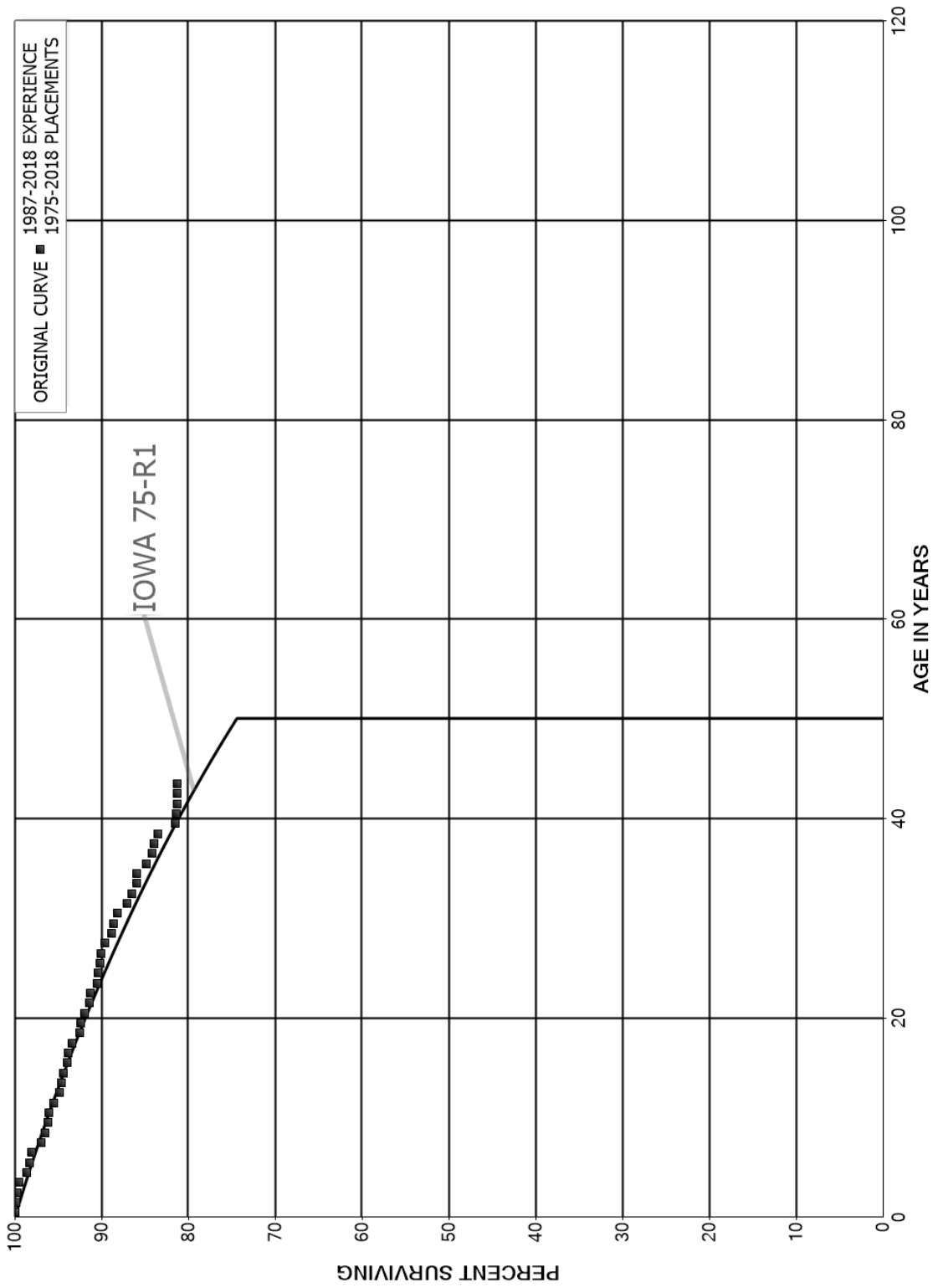
EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 0.0 | 31,003,182 | 7,613 | 0.0002 | 0.9998 | 100.00 |
| 0.5 | 101,222,847 | 44,544 | 0.0004 | 0.9996 | 99.98 |
| 1.5 | 102,639,947 | 305,164 | 0.0030 | 0.9970 | 99.93 |
| 2.5 | 159,942,737 | 709,054 | 0.0044 | 0.9956 | 99.63 |
| 3.5 | 159,734,491 | 943,206 | 0.0059 | 0.9941 | 99.19 |
| 4.5 | 151,820,493 | 818,195 | 0.0054 | 0.9946 | 98.61 |
| 5.5 | 150,975,417 | 123,153 | 0.0008 | 0.9992 | 98.08 |
| 6.5 | 149,827,025 | 8,241 | 0.0001 | 0.9999 | 98.00 |
| 7.5 | 149,662,371 | 25,416 | 0.0002 | 0.9998 | 97.99 |
| 8.5 | 150,343,250 | 35,213 | 0.0002 | 0.9998 | 97.97 |
| 9.5 | 152,366,010 | 33,708 | 0.0002 | 0.9998 | 97.95 |
| 10.5 | 157,567,339 | 76,133 | 0.0005 | 0.9995 | 97.93 |
| 11.5 | 175,375,413 | 232,272 | 0.0013 | 0.9987 | 97.88 |
| 12.5 | 174,976,008 | 558,240 | 0.0032 | 0.9968 | 97.75 |
| 13.5 | 174,241,314 | 1,388,754 | 0.0080 | 0.9920 | 97.44 |
| 14.5 | 172,303,745 | 231,423 | 0.0013 | 0.9987 | 96.66 |
| 15.5 | 171,827,660 | 230,107 | 0.0013 | 0.9987 | 96.53 |
| 16.5 | 171,331,109 | 572,077 | 0.0033 | 0.9967 | 96.40 |
| 17.5 | 170,701,092 | 212,783 | 0.0012 | 0.9988 | 96.08 |
| 18.5 | 168,703,071 | 630,259 | 0.0037 | 0.9963 | 95.96 |
| 19.5 | 167,677,739 | 140,412 | 0.0008 | 0.9992 | 95.60 |
| 20.5 | 167,403,163 | 50,494 | 0.0003 | 0.9997 | 95.52 |
| 21.5 | 167,177,541 | 158,622 | 0.0009 | 0.9991 | 95.50 |
| 22.5 | 166,826,016 | 527,582 | 0.0032 | 0.9968 | 95.40 |
| 23.5 | 166,049,309 | 20,618 | 0.0001 | 0.9999 | 95.10 |
| 24.5 | 165,841,059 | 163,417 | 0.0010 | 0.9990 | 95.09 |
| 25.5 | 165,245,977 | 106,897 | 0.0006 | 0.9994 | 95.00 |
| 26.5 | 164,906,898 | 209,220 | 0.0013 | 0.9987 | 94.94 |
| 27.5 | 164,172,710 | 637,558 | 0.0039 | 0.9961 | 94.82 |
| 28.5 | 163,142,549 | 86,226 | 0.0005 | 0.9995 | 94.45 |
| 29.5 | 162,031,426 | 308,764 | 0.0019 | 0.9981 | 94.40 |
| 30.5 | 159,297,169 | 217,724 | 0.0014 | 0.9986 | 94.22 |
| 31.5 | 155,686,744 | 252,194 | 0.0016 | 0.9984 | 94.09 |
| 32.5 | 89,091,139 | 3,562,795 | 0.0400 | 0.9600 | 93.94 |
| 33.5 | 85,279,282 | 312,390 | 0.0037 | 0.9963 | 90.18 |
| 34.5 | 28,674,053 | | 0.0000 | 1.0000 | 89.85 |
| 35.5 | 28,113,402 | 65,868 | 0.0023 | 0.9977 | 89.85 |
| 36.5 | 27,871,613 | 140,419 | 0.0050 | 0.9950 | 89.64 |
| 37.5 | 26,817,460 | 13,780 | 0.0005 | 0.9995 | 89.19 |
| 38.5 | 26,230,607 | 172,050 | 0.0066 | 0.9934 | 89.14 |

PLACEMENT BAND 1975-2018

EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 39.5 | 25,246,723 | 80,020 | 0.0032 | 0.9968 | 88.56 |
| 40.5 | 23,921,276 | 12,457 | 0.0005 | 0.9995 | 88.28 |
| 41.5 | 21,451,898 | | 0.0000 | 1.0000 | 88.23 |
| 42.5 | 17,953,261 | 147 | 0.0000 | 1.0000 | 88.23 |
| 43.5 | | | | | 88.23 |



PLACEMENT BAND 1975-2018

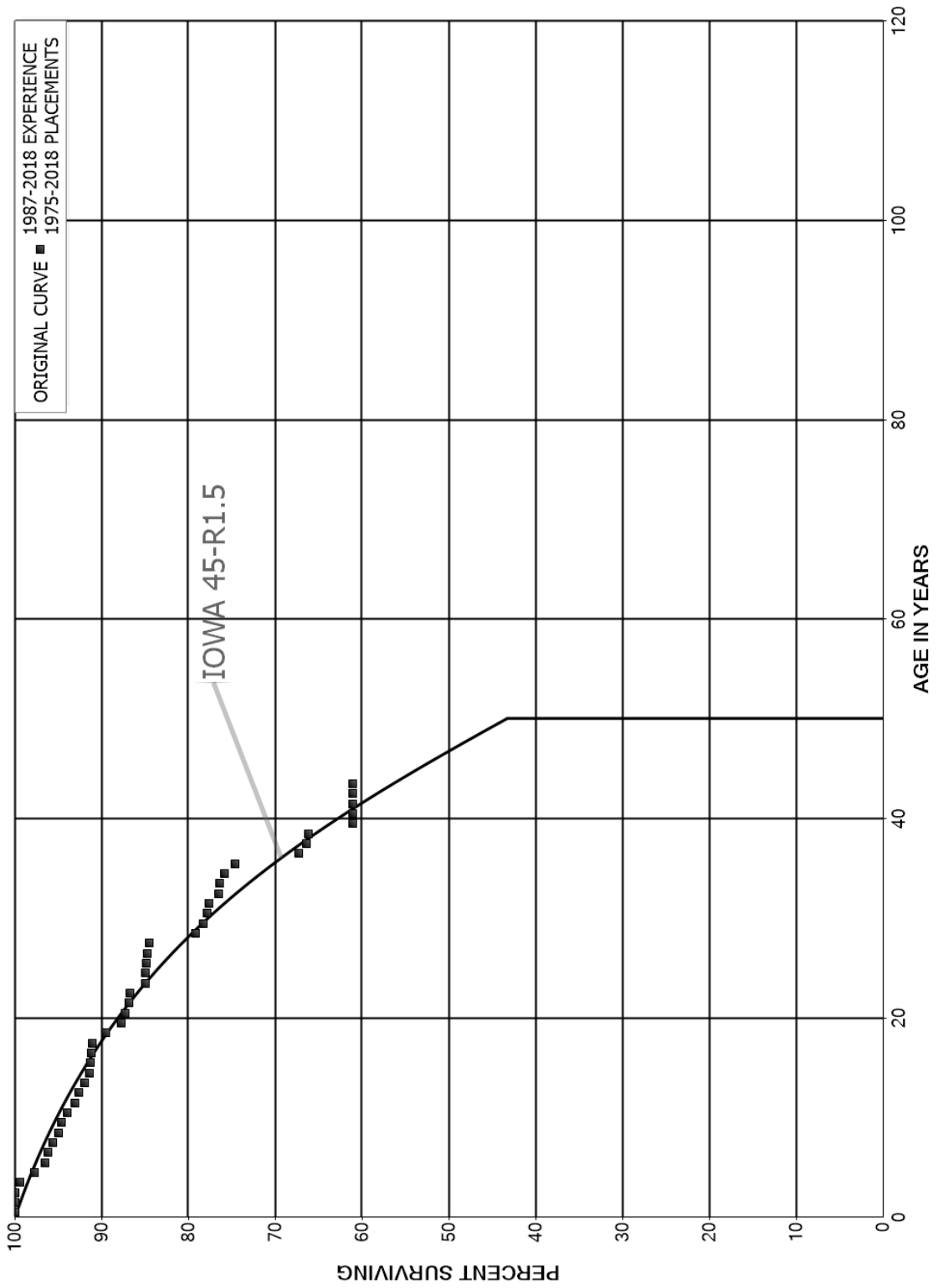
EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 0.0 | 399,470,966 | 72,638 | 0.0002 | 0.9998 | 100.00 |
| 0.5 | 508,201,007 | 544,170 | 0.0011 | 0.9989 | 99.98 |
| 1.5 | 547,843,521 | 980,747 | 0.0018 | 0.9982 | 99.87 |
| 2.5 | 651,560,191 | 1,268,772 | 0.0019 | 0.9981 | 99.70 |
| 3.5 | 650,487,621 | 5,858,987 | 0.0090 | 0.9910 | 99.50 |
| 4.5 | 618,401,914 | 1,748,016 | 0.0028 | 0.9972 | 98.61 |
| 5.5 | 603,332,182 | 1,761,282 | 0.0029 | 0.9971 | 98.33 |
| 6.5 | 545,859,196 | 6,137,421 | 0.0112 | 0.9888 | 98.04 |
| 7.5 | 527,711,130 | 2,200,145 | 0.0042 | 0.9958 | 96.94 |
| 8.5 | 523,943,205 | 1,687,159 | 0.0032 | 0.9968 | 96.53 |
| 9.5 | 506,004,770 | 606,552 | 0.0012 | 0.9988 | 96.22 |
| 10.5 | 480,368,833 | 2,901,520 | 0.0060 | 0.9940 | 96.11 |
| 11.5 | 423,293,506 | 3,125,944 | 0.0074 | 0.9926 | 95.53 |
| 12.5 | 414,303,124 | 1,041,750 | 0.0025 | 0.9975 | 94.82 |
| 13.5 | 408,198,314 | 866,386 | 0.0021 | 0.9979 | 94.58 |
| 14.5 | 385,703,793 | 1,537,496 | 0.0040 | 0.9960 | 94.38 |
| 15.5 | 377,426,455 | 678,001 | 0.0018 | 0.9982 | 94.01 |
| 16.5 | 371,420,172 | 1,914,193 | 0.0052 | 0.9948 | 93.84 |
| 17.5 | 364,150,377 | 3,099,531 | 0.0085 | 0.9915 | 93.35 |
| 18.5 | 319,377,687 | 579,571 | 0.0018 | 0.9982 | 92.56 |
| 19.5 | 318,212,186 | 1,653,902 | 0.0052 | 0.9948 | 92.39 |
| 20.5 | 316,442,718 | 1,830,219 | 0.0058 | 0.9942 | 91.91 |
| 21.5 | 314,408,022 | 353,853 | 0.0011 | 0.9989 | 91.38 |
| 22.5 | 313,148,587 | 2,520,725 | 0.0080 | 0.9920 | 91.28 |
| 23.5 | 310,444,849 | 680,114 | 0.0022 | 0.9978 | 90.54 |
| 24.5 | 309,569,612 | 482,729 | 0.0016 | 0.9984 | 90.34 |
| 25.5 | 308,256,953 | 580,865 | 0.0019 | 0.9981 | 90.20 |
| 26.5 | 306,972,251 | 1,463,222 | 0.0048 | 0.9952 | 90.03 |
| 27.5 | 304,277,085 | 2,637,477 | 0.0087 | 0.9913 | 89.60 |
| 28.5 | 301,194,570 | 877,369 | 0.0029 | 0.9971 | 88.83 |
| 29.5 | 299,860,897 | 1,204,832 | 0.0040 | 0.9960 | 88.57 |
| 30.5 | 298,041,141 | 3,693,359 | 0.0124 | 0.9876 | 88.21 |
| 31.5 | 293,543,368 | 2,244,104 | 0.0076 | 0.9924 | 87.12 |
| 32.5 | 187,086,882 | 995,065 | 0.0053 | 0.9947 | 86.45 |
| 33.5 | 186,007,986 | 156,746 | 0.0008 | 0.9992 | 85.99 |
| 34.5 | 75,267,293 | 984,400 | 0.0131 | 0.9869 | 85.92 |
| 35.5 | 73,652,073 | 577,517 | 0.0078 | 0.9922 | 84.80 |
| 36.5 | 72,424,016 | 156,295 | 0.0022 | 0.9978 | 84.13 |
| 37.5 | 71,428,135 | 373,830 | 0.0052 | 0.9948 | 83.95 |
| 38.5 | 69,038,492 | 1,659,888 | 0.0240 | 0.9760 | 83.51 |

PLACEMENT BAND 1975-2018

EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 39.5 | 64,885,371 | 116,209 | 0.0018 | 0.9982 | 81.50 |
| 40.5 | 60,380,456 | 67,247 | 0.0011 | 0.9989 | 81.36 |
| 41.5 | 59,192,985 | | 0.0000 | 1.0000 | 81.27 |
| 42.5 | 32,088,361 | | 0.0000 | 1.0000 | 81.27 |
| 43.5 | | | | | 81.27 |



PLACEMENT BAND 1975-2018

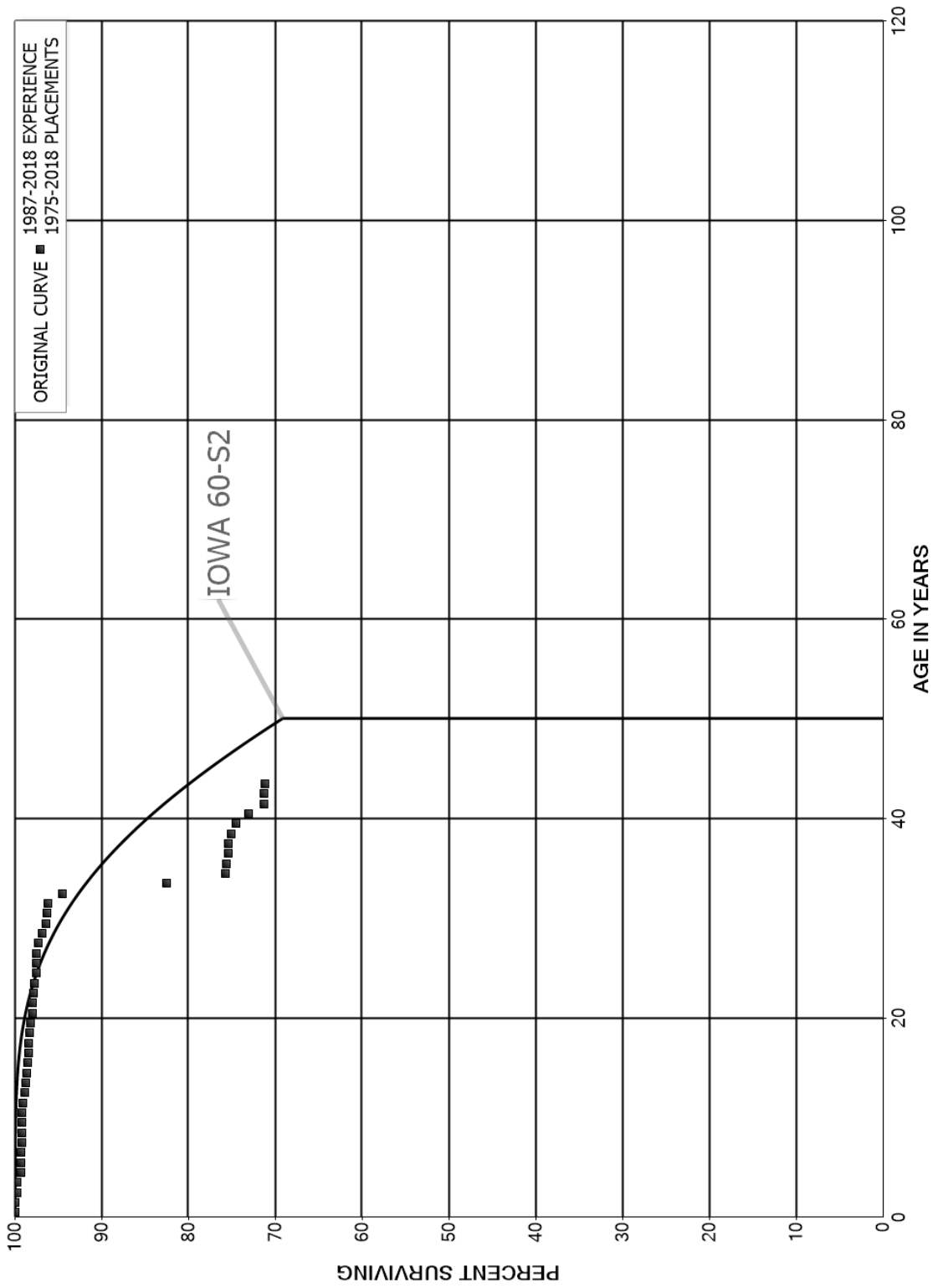
EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 0.0 | 228,073,178 | 33,323 | 0.0001 | 0.9999 | 100.00 |
| 0.5 | 286,981,899 | 62,099 | 0.0002 | 0.9998 | 99.99 |
| 1.5 | 326,133,699 | 55,372 | 0.0002 | 0.9998 | 99.96 |
| 2.5 | 345,820,604 | 2,050,617 | 0.0059 | 0.9941 | 99.95 |
| 3.5 | 343,157,149 | 5,533,220 | 0.0161 | 0.9839 | 99.35 |
| 4.5 | 333,982,439 | 4,359,298 | 0.0131 | 0.9869 | 97.75 |
| 5.5 | 328,698,596 | 944,991 | 0.0029 | 0.9971 | 96.48 |
| 6.5 | 301,468,310 | 1,856,603 | 0.0062 | 0.9938 | 96.20 |
| 7.5 | 288,335,647 | 1,937,827 | 0.0067 | 0.9933 | 95.61 |
| 8.5 | 280,877,756 | 920,183 | 0.0033 | 0.9967 | 94.96 |
| 9.5 | 274,718,079 | 2,201,410 | 0.0080 | 0.9920 | 94.65 |
| 10.5 | 236,239,063 | 2,061,170 | 0.0087 | 0.9913 | 93.89 |
| 11.5 | 152,275,638 | 741,741 | 0.0049 | 0.9951 | 93.08 |
| 12.5 | 140,156,750 | 1,041,906 | 0.0074 | 0.9926 | 92.62 |
| 13.5 | 133,443,674 | 752,197 | 0.0056 | 0.9944 | 91.93 |
| 14.5 | 111,315,913 | 199,532 | 0.0018 | 0.9982 | 91.41 |
| 15.5 | 110,721,245 | 25,557 | 0.0002 | 0.9998 | 91.25 |
| 16.5 | 109,933,214 | 193,796 | 0.0018 | 0.9982 | 91.23 |
| 17.5 | 108,591,319 | 1,929,857 | 0.0178 | 0.9822 | 91.07 |
| 18.5 | 85,871,437 | 1,702,159 | 0.0198 | 0.9802 | 89.45 |
| 19.5 | 83,893,162 | 403,570 | 0.0048 | 0.9952 | 87.68 |
| 20.5 | 83,361,595 | 365,067 | 0.0044 | 0.9956 | 87.26 |
| 21.5 | 82,996,529 | 108,114 | 0.0013 | 0.9987 | 86.87 |
| 22.5 | 80,583,022 | 1,693,632 | 0.0210 | 0.9790 | 86.76 |
| 23.5 | 75,442,910 | 19,179 | 0.0003 | 0.9997 | 84.94 |
| 24.5 | 74,763,064 | 88,216 | 0.0012 | 0.9988 | 84.92 |
| 25.5 | 74,224,253 | 58,377 | 0.0008 | 0.9992 | 84.82 |
| 26.5 | 73,247,770 | 176,148 | 0.0024 | 0.9976 | 84.75 |
| 27.5 | 72,256,980 | 4,627,630 | 0.0640 | 0.9360 | 84.54 |
| 28.5 | 67,514,551 | 729,704 | 0.0108 | 0.9892 | 79.13 |
| 29.5 | 66,638,133 | 418,318 | 0.0063 | 0.9937 | 78.27 |
| 30.5 | 65,975,827 | 155,397 | 0.0024 | 0.9976 | 77.78 |
| 31.5 | 65,518,227 | 960,854 | 0.0147 | 0.9853 | 77.60 |
| 32.5 | 45,190,146 | 16,786 | 0.0004 | 0.9996 | 76.46 |
| 33.5 | 44,918,049 | 357,459 | 0.0080 | 0.9920 | 76.43 |
| 34.5 | 23,022,082 | 360,508 | 0.0157 | 0.9843 | 75.83 |
| 35.5 | 22,580,832 | 2,237,207 | 0.0991 | 0.9009 | 74.64 |
| 36.5 | 20,275,588 | 265,354 | 0.0131 | 0.9869 | 67.24 |
| 37.5 | 19,898,528 | 70,320 | 0.0035 | 0.9965 | 66.36 |
| 38.5 | 19,786,892 | 1,501,032 | 0.0759 | 0.9241 | 66.13 |

PLACEMENT BAND 1975-2018

EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 39.5 | 17,412,273 | | 0.0000 | 1.0000 | 61.11 |
| 40.5 | 16,947,764 | | 0.0000 | 1.0000 | 61.11 |
| 41.5 | 16,465,754 | | 0.0000 | 1.0000 | 61.11 |
| 42.5 | 5,943,486 | | 0.0000 | 1.0000 | 61.11 |
| 43.5 | | | | | 61.11 |



PLACEMENT BAND 1975-2018

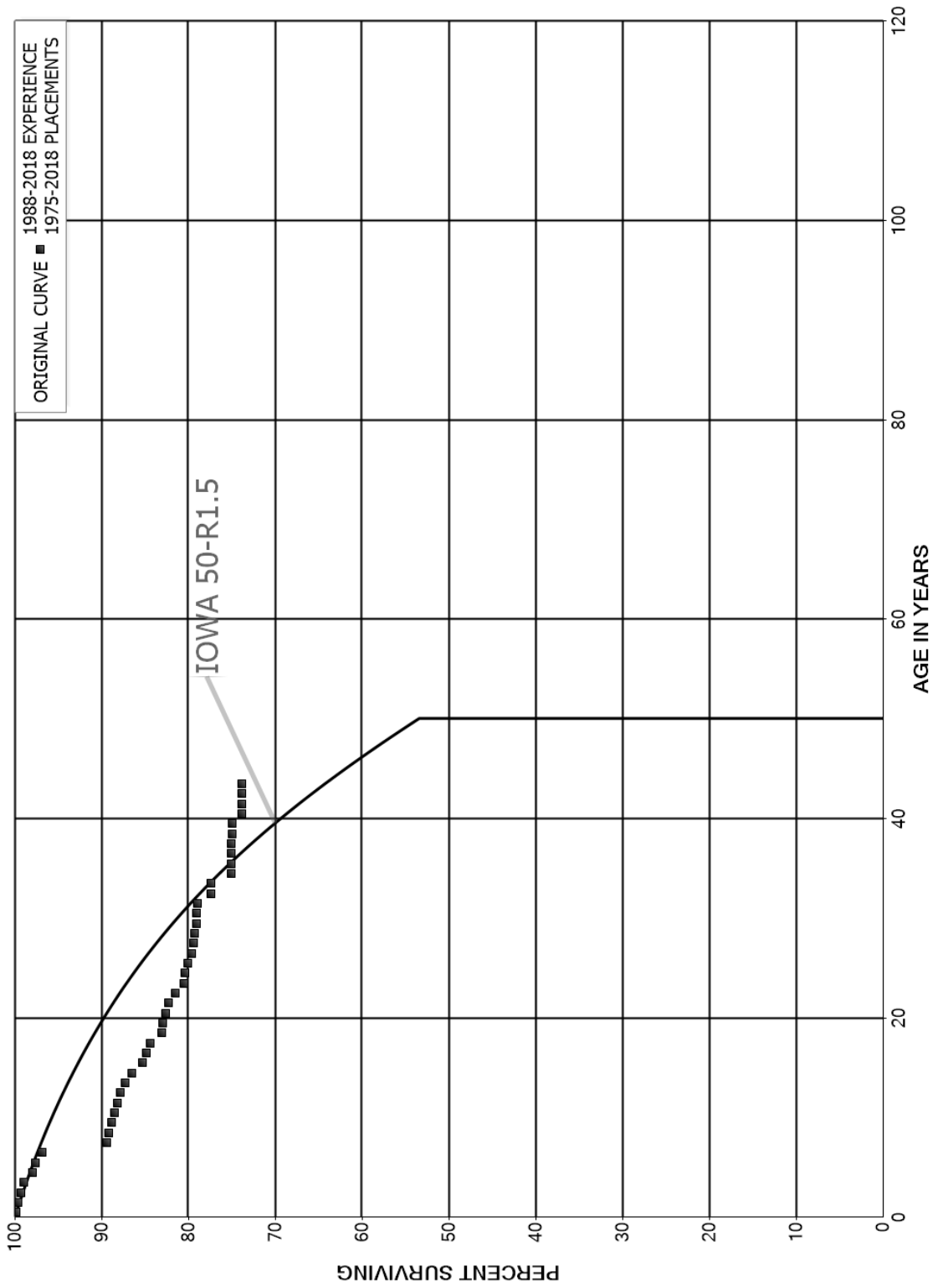
EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 0.0 | 18,909,066 | | 0.0000 | 1.0000 | 100.00 |
| 0.5 | 28,616,992 | 9 | 0.0000 | 1.0000 | 100.00 |
| 1.5 | 31,395,208 | 88,370 | 0.0028 | 0.9972 | 100.00 |
| 2.5 | 38,405,934 | 329 | 0.0000 | 1.0000 | 99.72 |
| 3.5 | 38,444,678 | 160,609 | 0.0042 | 0.9958 | 99.72 |
| 4.5 | 37,377,418 | 52 | 0.0000 | 1.0000 | 99.30 |
| 5.5 | 37,212,425 | 2,408 | 0.0001 | 0.9999 | 99.30 |
| 6.5 | 35,649,247 | 60,899 | 0.0017 | 0.9983 | 99.29 |
| 7.5 | 35,727,066 | 344 | 0.0000 | 1.0000 | 99.12 |
| 8.5 | 35,792,616 | 623 | 0.0000 | 1.0000 | 99.12 |
| 9.5 | 35,613,691 | 403 | 0.0000 | 1.0000 | 99.12 |
| 10.5 | 37,283,047 | 40,825 | 0.0011 | 0.9989 | 99.12 |
| 11.5 | 37,525,979 | 71,337 | 0.0019 | 0.9981 | 99.01 |
| 12.5 | 37,377,342 | 37,035 | 0.0010 | 0.9990 | 98.82 |
| 13.5 | 37,333,772 | 21,760 | 0.0006 | 0.9994 | 98.73 |
| 14.5 | 36,349,461 | 71,634 | 0.0020 | 0.9980 | 98.67 |
| 15.5 | 36,101,562 | 14,814 | 0.0004 | 0.9996 | 98.47 |
| 16.5 | 35,394,221 | 11,203 | 0.0003 | 0.9997 | 98.43 |
| 17.5 | 35,327,405 | 55,892 | 0.0016 | 0.9984 | 98.40 |
| 18.5 | 33,531,152 | 7,774 | 0.0002 | 0.9998 | 98.25 |
| 19.5 | 33,475,379 | 85,977 | 0.0026 | 0.9974 | 98.22 |
| 20.5 | 33,357,310 | 10,759 | 0.0003 | 0.9997 | 97.97 |
| 21.5 | 33,327,955 | 19,827 | 0.0006 | 0.9994 | 97.94 |
| 22.5 | 33,292,349 | 39,864 | 0.0012 | 0.9988 | 97.88 |
| 23.5 | 33,215,699 | 84,896 | 0.0026 | 0.9974 | 97.77 |
| 24.5 | 33,101,436 | 12,836 | 0.0004 | 0.9996 | 97.52 |
| 25.5 | 32,987,442 | 7,314 | 0.0002 | 0.9998 | 97.48 |
| 26.5 | 32,956,938 | 45,628 | 0.0014 | 0.9986 | 97.46 |
| 27.5 | 32,818,650 | 146,591 | 0.0045 | 0.9955 | 97.32 |
| 28.5 | 32,526,046 | 160,800 | 0.0049 | 0.9951 | 96.89 |
| 29.5 | 32,292,392 | 35,832 | 0.0011 | 0.9989 | 96.41 |
| 30.5 | 32,124,387 | 24,341 | 0.0008 | 0.9992 | 96.30 |
| 31.5 | 32,028,611 | 571,900 | 0.0179 | 0.9821 | 96.23 |
| 32.5 | 22,129,048 | 2,803,129 | 0.1267 | 0.8733 | 94.51 |
| 33.5 | 19,230,396 | 1,578,883 | 0.0821 | 0.9179 | 82.54 |
| 34.5 | 8,909,396 | 19,867 | 0.0022 | 0.9978 | 75.76 |
| 35.5 | 8,850,885 | 21,747 | 0.0025 | 0.9975 | 75.59 |
| 36.5 | 8,771,801 | | 0.0000 | 1.0000 | 75.41 |
| 37.5 | 8,583,556 | 44,754 | 0.0052 | 0.9948 | 75.41 |
| 38.5 | 8,518,345 | 60,000 | 0.0070 | 0.9930 | 75.01 |

PLACEMENT BAND 1975-2018

EXPERIENCE BAND 1987-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 39.5 | 8,175,553 | 153,487 | 0.0188 | 0.9812 | 74.48 |
| 40.5 | 7,892,889 | 197,705 | 0.0250 | 0.9750 | 73.09 |
| 41.5 | 7,616,068 | 2,217 | 0.0003 | 0.9997 | 71.26 |
| 42.5 | 6,174,672 | 2,217 | 0.0004 | 0.9996 | 71.23 |
| 43.5 | | | | | 71.21 |



PLACEMENT BAND 1975-2018

EXPERIENCE BAND 1988-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 0.0 | 10,029,601 | 14,701 | 0.0015 | 0.9985 | 100.00 |
| 0.5 | 10,983,151 | 30,255 | 0.0028 | 0.9972 | 99.85 |
| 1.5 | 13,551,912 | 46,295 | 0.0034 | 0.9966 | 99.58 |
| 2.5 | 13,784,644 | 46,775 | 0.0034 | 0.9966 | 99.24 |
| 3.5 | 15,326,647 | 141,220 | 0.0092 | 0.9908 | 98.90 |
| 4.5 | 14,869,254 | 56,196 | 0.0038 | 0.9962 | 97.99 |
| 5.5 | 15,033,215 | 114,672 | 0.0076 | 0.9924 | 97.62 |
| 6.5 | 15,172,260 | 1,165,078 | 0.0768 | 0.9232 | 96.88 |
| 7.5 | 14,194,681 | 43,583 | 0.0031 | 0.9969 | 89.44 |
| 8.5 | 14,225,642 | 58,702 | 0.0041 | 0.9959 | 89.16 |
| 9.5 | 14,181,170 | 45,659 | 0.0032 | 0.9968 | 88.79 |
| 10.5 | 13,786,751 | 60,126 | 0.0044 | 0.9956 | 88.51 |
| 11.5 | 14,511,129 | 49,147 | 0.0034 | 0.9966 | 88.12 |
| 12.5 | 14,646,804 | 85,068 | 0.0058 | 0.9942 | 87.82 |
| 13.5 | 14,525,251 | 133,218 | 0.0092 | 0.9908 | 87.31 |
| 14.5 | 13,969,489 | 195,403 | 0.0140 | 0.9860 | 86.51 |
| 15.5 | 13,707,994 | 74,489 | 0.0054 | 0.9946 | 85.30 |
| 16.5 | 13,597,741 | 70,576 | 0.0052 | 0.9948 | 84.84 |
| 17.5 | 13,338,925 | 202,121 | 0.0152 | 0.9848 | 84.40 |
| 18.5 | 12,849,688 | 32,792 | 0.0026 | 0.9974 | 83.12 |
| 19.5 | 12,373,631 | 51,149 | 0.0041 | 0.9959 | 82.91 |
| 20.5 | 12,000,604 | 42,301 | 0.0035 | 0.9965 | 82.56 |
| 21.5 | 11,743,039 | 111,667 | 0.0095 | 0.9905 | 82.27 |
| 22.5 | 11,405,966 | 139,679 | 0.0122 | 0.9878 | 81.49 |
| 23.5 | 10,923,699 | 15,022 | 0.0014 | 0.9986 | 80.49 |
| 24.5 | 9,995,594 | 41,715 | 0.0042 | 0.9958 | 80.38 |
| 25.5 | 9,400,936 | 45,684 | 0.0049 | 0.9951 | 80.05 |
| 26.5 | 8,815,885 | 29,893 | 0.0034 | 0.9966 | 79.66 |
| 27.5 | 8,250,100 | 12,023 | 0.0015 | 0.9985 | 79.39 |
| 28.5 | 7,949,454 | 16,302 | 0.0021 | 0.9979 | 79.27 |
| 29.5 | 7,360,114 | 5,850 | 0.0008 | 0.9992 | 79.11 |
| 30.5 | 7,038,276 | 4,851 | 0.0007 | 0.9993 | 79.05 |
| 31.5 | 6,774,920 | 132,424 | 0.0195 | 0.9805 | 78.99 |
| 32.5 | 4,516,279 | | 0.0000 | 1.0000 | 77.45 |
| 33.5 | 4,149,920 | 128,724 | 0.0310 | 0.9690 | 77.45 |
| 34.5 | 2,741,190 | | 0.0000 | 1.0000 | 75.05 |
| 35.5 | 2,614,175 | | 0.0000 | 1.0000 | 75.05 |
| 36.5 | 2,379,100 | | 0.0000 | 1.0000 | 75.05 |
| 37.5 | 2,100,017 | 2,864 | 0.0014 | 0.9986 | 75.05 |
| 38.5 | 1,876,434 | | 0.0000 | 1.0000 | 74.94 |

PLACEMENT BAND 1975-2018

EXPERIENCE BAND 1988-2018

| AGE AT BEGIN OF INTERVAL | EXPOSURES AT BEGINNING OF AGE INTERVAL | RETIREMENTS DURING AGE INTERVAL | RETMT RATIO | SURV RATIO | PCT SURV BEGIN OF INTERVAL |
|--------------------------------|--|---------------------------------------|----------------|---------------|----------------------------------|
| 39.5 | 1,795,918 | 27,497 | 0.0153 | 0.9847 | 74.94 |
| 40.5 | 1,620,798 | | 0.0000 | 1.0000 | 73.80 |
| 41.5 | 1,357,265 | | 0.0000 | 1.0000 | 73.80 |
| 42.5 | 550,388 | | 0.0000 | 1.0000 | 73.80 |
| 43.5 | | | | | 73.80 |

PUGET SOUND ENERGY

CALCULATION OF WEIGHTED NET SALVAGE PERCENT FOR GENERATION PLANT AS OF DECEMBER 31, 2018

| Account (1) | Terminal Retirements | | Interim Retirements | | Total | | Estimated Net Salvage Net (%) (10)=(8)/(9) |
|--|----------------------------|----------------------------|----------------------------|----------------------------|------------------------------------|------------------------------------|---|
| | Retirements (\$) (2) | Net Salvage (\$) (3) | Retirements (\$) (5) | Net Salvage (\$) (6) | Retirements (\$) (9)=(2)+(5) | Net Salvage (\$) (8)=(3)+(7) | |
| <u>COLSTRIP 3</u> | | | | | | | |
| 311.00 STRUCTURES AND IMPROVEMENTS | 29,212,564 | 4,118,515 | 774,608 | 38,730 | 4,157,246 | 29,987,172 | (14) |
| 312.00 BOILER PLANT EQUIPMENT | 141,617,100 | 19,965,800 | 5,491,126 | 274,566 | 20,240,356 | 147,108,226 | (14) |
| 314.00 TURBOGENERATOR UNITS | 38,268,962 | 5,395,326 | 3,901,062 | 78,021 | 5,473,347 | 42,170,024 | (13) |
| 315.00 ACCESSORY ELECTRIC EQUIPMENT | 6,842,055 | 964,623 | 415,568 | - | 964,623 | 7,257,623 | (13) |
| 316.00 MISCELLANEOUS POWER PLANT EQUIPMENT | 1,011,289 | 142,576 | 58,544 | - | 142,576 | 1,069,834 | (13) |
| TOTAL COLSTRIP 3 | 216,951,970 | 30,586,840 | 10,640,908 | 391,308 | 30,978,148 | 227,592,878 | (14) |
| <u>COLSTRIP 4</u> | | | | | | | |
| 311.00 STRUCTURES AND IMPROVEMENTS | 27,426,516 | 3,865,710 | 697,801 | 34,890 | 3,901,601 | 28,124,317 | (14) |
| 312.00 BOILER PLANT EQUIPMENT | 125,012,073 | 17,624,750 | 4,721,405 | 236,070 | 17,860,821 | 129,733,478 | (14) |
| 314.00 TURBOGENERATOR UNITS | 36,621,849 | 5,163,109 | 3,334,513 | 66,690 | 5,229,799 | 39,956,362 | (13) |
| 315.00 ACCESSORY ELECTRIC EQUIPMENT | 6,244,927 | 890,437 | 322,868 | - | 890,437 | 6,567,795 | (13) |
| 316.00 MISCELLANEOUS POWER PLANT EQUIPMENT | 1,123,408 | 158,383 | 66,116 | - | 158,383 | 1,191,524 | (13) |
| TOTAL COLSTRIP 4 | 196,428,773 | 27,695,390 | 9,144,702 | 337,651 | 28,031,040 | 205,573,474 | (14) |
| <u>COLSTRIP 1-4</u> | | | | | | | |
| 316.00 MISCELLANEOUS POWER PLANT EQUIPMENT | 227,153 | 32,025 | 24,380 | - | 32,025 | 251,534 | (13) |
| TOTAL COLSTRIP 1-4 | 227,153 | 32,025 | 24,380 | - | 32,025 | 251,534 | (13) |
| <u>COLSTRIP 3-4</u> | | | | | | | |
| 311.00 STRUCTURES AND IMPROVEMENTS | 68,192,320 | 9,614,052 | 1,848,798 | 92,440 | 9,706,492 | 70,041,118 | (14) |
| 312.00 BOILER PLANT EQUIPMENT | 14,549,315 | 2,051,226 | 622,504 | 31,125 | 2,082,351 | 15,171,819 | (14) |
| 315.00 ACCESSORY ELECTRIC EQUIPMENT | 7,114,013 | 1,002,964.79 | 524,993 | - | 1,002,965 | 7,639,006 | (13) |
| 316.00 MISCELLANEOUS POWER PLANT EQUIPMENT | 3,987,387 | 559,340 | 358,228 | - | 559,340 | 4,325,615 | (13) |
| TOTAL COLSTRIP 3-4 | 93,823,034 | 13,227,583 | 3,384,523 | 123,565 | 13,351,148 | 97,177,558 | (14) |
| TOTAL COLSTRIP 3 & 4 | 507,430,930 | 71,539,838 | 23,164,514 | 852,524 | 72,392,361 | 530,595,444 | |

| | | | | | | | |
|-------|------------|-----------|-----|---------|----|------------|------|
| 2002 | 313,331 | | 0 | | 0 | | 0 |
| 2003 | 1,711,678 | 2,515 | 0 | 352,874 | 21 | 350,359 | 20 |
| 2004 | 238,908 | | 0 | 15,878 | 7 | 15,878 | 7 |
| 2005 | 80,594 | 1,737 | 2 | 42,595 | 53 | 40,858 | 51 |
| 2006 | 65,879 | | 0 | | 0 | | 0 |
| 2007 | 34,501 | | 0 | | 0 | | 0 |
| 2008 | 130,942 | 4,876- | 4- | 27,304 | 21 | 32,180 | 25 |
| 2009 | 5,002,542 | 75- | 0 | | 0 | 75 | 0 |
| 2010 | | | | | | | |
| 2011 | 169,968 | 3,139- | 2- | | 0 | 3,139 | 2 |
| 2012 | 133,014 | 4- | 0 | 22 | 0 | 26 | 0 |
| 2013 | 20,432 | 2,733- | 13- | | 0 | 2,733 | 13 |
| 2014 | 768,853 | | 0 | | 0 | | 0 |
| 2015 | 412,215 | | 0 | | 0 | | 0 |
| 2016 | 270,500 | | 0 | | 0 | | 0 |
| 2017 | | 2,231,681 | | | | 2,231,681- | |
| 2018 | 1,281,641 | 2,150,021 | 168 | | 0 | 2,150,021- | 168- |
| TOTAL | 10,634,998 | 4,375,127 | 41 | 438,673 | 4 | 3,936,454- | 37- |

THREE-YEAR MOVING AVERAGES

| | | | | | | | |
|-------|-----------|-----------|-----|---------|----|------------|------|
| 02-04 | 754,639 | 838 | 0 | 122,917 | 16 | 122,079 | 16 |
| 03-05 | 677,060 | 1,417 | 0 | 137,116 | 20 | 135,698 | 20 |
| 04-06 | 128,460 | 579 | 0 | 19,491 | 15 | 18,912 | 15 |
| 05-07 | 60,325 | 579 | 1 | 14,198 | 24 | 13,619 | 23 |
| 06-08 | 77,107 | 1,625- | 2- | 9,101 | 12 | 10,727 | 14 |
| 07-09 | 1,722,661 | 1,650- | 0 | 9,101 | 1 | 10,752 | 1 |
| 08-10 | 1,711,161 | 1,650- | 0 | 9,101 | 1 | 10,752 | 1 |
| 09-11 | 1,724,170 | 1,071- | 0 | | 0 | 1,071 | 0 |
| 10-12 | 100,994 | 1,048- | 1- | 7 | 0 | 1,055 | 1 |
| 11-13 | 107,805 | 1,959- | 2- | 7 | 0 | 1,966 | 2 |
| 12-14 | 307,433 | 912- | 0 | 7 | 0 | 920 | 0 |
| 13-15 | 400,500 | 911- | 0 | | 0 | 911 | 0 |
| 14-16 | 483,856 | | 0 | | 0 | | 0 |
| 15-17 | 227,572 | 743,894 | 327 | | 0 | 743,894- | 327- |
| 16-18 | 517,380 | 1,460,567 | 282 | | 0 | 1,460,567- | 282- |

FIVE-YEAR AVERAGE

| | | | | | | | |
|-------|---------|---------|-----|--|---|----------|------|
| 14-18 | 546,642 | 876,340 | 160 | | 0 | 876,340- | 160- |
|-------|---------|---------|-----|--|---|----------|------|

| | | | | | | | |
|-------|------------|-----------|-----|-------|----|------------|------|
| 1998 | 21,389 | 19,413 | 91 | 7,345 | 34 | 12,068- | 56- |
| 1999 | | | | | | | |
| 2000 | | | | | | | |
| 2001 | 738,371 | | 0 | | 0 | | 0 |
| 2002 | 421,808 | | 0 | | 0 | | 0 |
| 2003 | 521,697 | 15,272 | 3 | | 0 | 15,272- | 3- |
| 2004 | 4,313,083 | | 0 | | 0 | | 0 |
| 2005 | 902,107 | | 0 | | 0 | | 0 |
| 2006 | 707,468 | | 0 | | 0 | | 0 |
| 2007 | 8,068,369 | | 0 | | 0 | | 0 |
| 2008 | 645,057 | 11,723- | 2- | | 0 | 11,723 | 2 |
| 2009 | 2,897,174 | 2,178- | 0 | | 0 | 2,178 | 0 |
| 2010 | 10,064 | 1,196,488 | | | 0 | 1,196,488- | |
| 2011 | 4,936,405 | 30,745- | 1- | | 0 | 30,745 | 1 |
| 2012 | 3,748,373 | 3,716 | 0 | 1,530 | 0 | 2,186- | 0 |
| 2013 | 103,217 | | 0 | | 0 | | 0 |
| 2014 | 10,906,802 | 1,828 | 0 | | 0 | 1,828- | 0 |
| 2015 | 10,219,645 | 6,208 | 0 | | 0 | 6,208- | 0 |
| 2016 | 3,734,440 | 49,794 | 1 | | 0 | 49,794- | 1- |
| 2017 | 187,091 | 1,088,752 | 582 | | 0 | 1,088,752- | 582- |
| 2018 | 8,368,681 | | 0 | | 0 | | 0 |
| TOTAL | 61,451,241 | 2,336,826 | 4 | 8,875 | 0 | 2,327,952- | 4- |

THREE-YEAR MOVING AVERAGES

| | | | | | | | |
|-------|-----------|---------|----|-------|----|----------|-----|
| 98-00 | 7,130 | 6,471 | 91 | 2,448 | 34 | 4,023- | 56- |
| 99-01 | 246,124 | | 0 | | 0 | | 0 |
| 00-02 | 386,726 | | 0 | | 0 | | 0 |
| 01-03 | 560,625 | 5,091 | 1 | | 0 | 5,091- | 1- |
| 02-04 | 1,752,196 | 5,091 | 0 | | 0 | 5,091- | 0 |
| 03-05 | 1,912,296 | 5,091 | 0 | | 0 | 5,091- | 0 |
| 04-06 | 1,974,219 | | 0 | | 0 | | 0 |
| 05-07 | 3,225,981 | | 0 | | 0 | | 0 |
| 06-08 | 3,140,298 | 3,908- | 0 | | 0 | 3,908 | 0 |
| 07-09 | 3,870,200 | 4,634- | 0 | | 0 | 4,634 | 0 |
| 08-10 | 1,184,098 | 394,196 | 33 | | 0 | 394,196- | 33- |
| 09-11 | 2,614,548 | 387,855 | 15 | | 0 | 387,855- | 15- |
| 10-12 | 2,898,281 | 389,820 | 13 | 510 | 0 | 389,310- | 13- |
| 11-13 | 2,929,332 | 9,009- | 0 | 510 | 0 | 9,519 | 0 |
| 12-14 | 4,919,464 | 1,848 | 0 | 510 | 0 | 1,338- | 0 |
| 13-15 | 7,076,554 | 2,679 | 0 | | 0 | 2,679- | 0 |

THREE-YEAR MOVING AVERAGES

| | | | | | | |
|-------|-----------|---------|---|---|----------|----|
| 14-16 | 8,286,962 | 19,277 | 0 | 0 | 19,277- | 0 |
| 15-17 | 4,713,725 | 381,584 | 8 | 0 | 381,584- | 8- |
| 16-18 | 4,096,737 | 379,515 | 9 | 0 | 379,515- | 9- |

FIVE-YEAR AVERAGE

| | | | | | | |
|-------|-----------|---------|---|---|----------|----|
| 14-18 | 6,683,332 | 229,316 | 3 | 0 | 229,316- | 3- |
|-------|-----------|---------|---|---|----------|----|

| | | | | | | | |
|-------|------------|---------|----|-------|---|----------|----|
| 2002 | 37,571 | | 0 | | 0 | | 0 |
| 2003 | 553,171 | 22,757 | 4 | | 0 | 22,757- | 4- |
| 2004 | 1,545,115 | | 0 | | 0 | | 0 |
| 2005 | 1,652,524 | | 0 | | 0 | | 0 |
| 2006 | 306,176 | | 0 | | 0 | | 0 |
| 2007 | 3,959,731 | | 0 | | 0 | | 0 |
| 2008 | 2,020,349 | | 0 | | 0 | | 0 |
| 2009 | 507,748 | 11,178- | 2- | | 0 | 11,178 | 2 |
| 2010 | | | | | | | |
| 2011 | 4,668,558 | 20,305- | 0 | | 0 | 20,305 | 0 |
| 2012 | 7,468,365 | 333,296 | 4 | 3,448 | 0 | 329,848- | 4- |
| 2013 | 290,908- | | 0 | | 0 | | 0 |
| 2014 | 10,796,076 | | 0 | | 0 | | 0 |
| 2015 | 3,116,653 | 104,215 | 3 | | 0 | 104,215- | 3- |
| 2016 | 1,321,558 | | 0 | | 0 | | 0 |
| 2017 | 75,312 | | 0 | | 0 | | 0 |
| 2018 | 4,743,609 | 37,005 | 1 | | 0 | 37,005- | 1- |
| TOTAL | 42,481,609 | 465,789 | 1 | 3,448 | 0 | 462,341- | 1- |

THREE-YEAR MOVING AVERAGES

| | | | | | | | |
|-------|-----------|---------|----|-------|---|----------|----|
| 02-04 | 711,952 | 7,586 | 1 | | 0 | 7,586- | 1- |
| 03-05 | 1,250,270 | 7,586 | 1 | | 0 | 7,586- | 1- |
| 04-06 | 1,167,938 | | 0 | | 0 | | 0 |
| 05-07 | 1,972,810 | | 0 | | 0 | | 0 |
| 06-08 | 2,095,419 | | 0 | | 0 | | 0 |
| 07-09 | 2,162,609 | 3,726- | 0 | | 0 | 3,726 | 0 |
| 08-10 | 842,699 | 3,726- | 0 | | 0 | 3,726 | 0 |
| 09-11 | 1,725,435 | 10,494- | 1- | | 0 | 10,494 | 1 |
| 10-12 | 4,045,641 | 104,330 | 3 | 1,149 | 0 | 103,181- | 3- |
| 11-13 | 3,948,671 | 104,330 | 3 | 1,149 | 0 | 103,181- | 3- |
| 12-14 | 5,991,178 | 111,099 | 2 | 1,149 | 0 | 109,949- | 2- |
| 13-15 | 4,540,607 | 34,738 | 1 | | 0 | 34,738- | 1- |
| 14-16 | 5,078,096 | 34,738 | 1 | | 0 | 34,738- | 1- |
| 15-17 | 1,504,508 | 34,738 | 2 | | 0 | 34,738- | 2- |
| 16-18 | 2,046,827 | 12,335 | 1 | | 0 | 12,335- | 1- |

FIVE-YEAR AVERAGE

| | | | | | | | |
|-------|-----------|--------|---|--|---|---------|----|
| 14-18 | 4,010,642 | 28,244 | 1 | | 0 | 28,244- | 1- |
|-------|-----------|--------|---|--|---|---------|----|

| | | | | | | | |
|-------|-----------|--------|----|---------|-----|---------|-----|
| 1998 | 7,045 | 6,394 | 91 | 2,419 | 34 | 3,975- | 56- |
| 1999 | | | | | | | |
| 2000 | | | | | | | |
| 2001 | | | | | | | |
| 2002 | | | | | | | |
| 2003 | 23,508 | 3,985 | 17 | | 0 | 3,985- | 17- |
| 2004 | 363,792 | | 0 | | 0 | | 0 |
| 2005 | 19,322 | | 0 | | 0 | | 0 |
| 2006 | 44,867 | | 0 | | 0 | | 0 |
| 2007 | 8,760 | | 0 | | 0 | | 0 |
| 2008 | 5,400 | 252- | 5- | | 0 | 252 | 5 |
| 2009 | 4,036,114 | | 0 | | 0 | | 0 |
| 2010 | | | | | | | |
| 2011 | 107,789 | 694- | 1- | | 0 | 694 | 1 |
| 2012 | 38,236 | 726 | 2 | | 0 | 726- | 2- |
| 2013 | 26,218 | | 0 | | 0 | | 0 |
| 2014 | 163,614 | | 0 | | 0 | | 0 |
| 2015 | 43,302 | | 0 | 128,638 | 297 | 128,638 | 297 |
| 2016 | 370,829 | | 0 | 13,012 | 4 | 13,012 | 4 |
| 2017 | | | | | | | |
| 2018 | 1,405,765 | 2,648- | 0 | 46,690 | 3 | 49,337 | 4 |
| TOTAL | 6,664,561 | 7,511 | 0 | 190,759 | 3 | 183,248 | 3 |

THREE-YEAR MOVING AVERAGES

| | | | | | | | |
|-------|-----------|-------|----|--------|----|--------|-----|
| 98-00 | 2,348 | 2,131 | 91 | 806 | 34 | 1,325- | 56- |
| 99-01 | | | | | | | |
| 00-02 | | | | | | | |
| 01-03 | 7,836 | 1,328 | 17 | | 0 | 1,328- | 17- |
| 02-04 | 129,100 | 1,328 | 1 | | 0 | 1,328- | 1- |
| 03-05 | 135,541 | 1,328 | 1 | | 0 | 1,328- | 1- |
| 04-06 | 142,660 | | 0 | | 0 | | 0 |
| 05-07 | 24,316 | | 0 | | 0 | | 0 |
| 06-08 | 19,676 | 84- | 0 | | 0 | 84 | 0 |
| 07-09 | 1,350,091 | 84- | 0 | | 0 | 84 | 0 |
| 08-10 | 1,347,171 | 84- | 0 | | 0 | 84 | 0 |
| 09-11 | 1,381,301 | 231- | 0 | | 0 | 231 | 0 |
| 10-12 | 48,675 | 11 | 0 | | 0 | 11- | 0 |
| 11-13 | 57,414 | 11 | 0 | | 0 | 11- | 0 |
| 12-14 | 76,023 | 242 | 0 | | 0 | 242- | 0 |
| 13-15 | 77,711 | | 0 | 42,879 | 55 | 42,879 | 55 |

THREE-YEAR MOVING AVERAGES

| | | | | | | | |
|-------|---------|------|---|--------|----|--------|----|
| 14-16 | 192,582 | | 0 | 47,217 | 25 | 47,217 | 25 |
| 15-17 | 138,044 | | 0 | 47,217 | 34 | 47,217 | 34 |
| 16-18 | 592,198 | 883- | 0 | 19,901 | 3 | 20,783 | 4 |

FIVE-YEAR AVERAGE

| | | | | | | | |
|-------|---------|------|---|--------|---|--------|----|
| 14-18 | 396,702 | 530- | 0 | 37,668 | 9 | 38,197 | 10 |
|-------|---------|------|---|--------|---|--------|----|

| | | | | | | | |
|-------|-----------|----------|-----|---------|----|---------|-----|
| 1998 | 53,113 | 48,209 | 91 | 18,240 | 34 | 29,969- | 56- |
| 1999 | | | | | | | |
| 2000 | | | | | | | |
| 2001 | 238,541 | | 0 | | 0 | | 0 |
| 2002 | 253,884 | | 0 | | 0 | | 0 |
| 2003 | 312 | 60 | 19 | | 0 | 60- | 19- |
| 2004 | 140,696 | | 0 | 22,338 | 16 | 22,338 | 16 |
| 2005 | | | | | | | |
| 2006 | 91,206 | | 0 | | 0 | | 0 |
| 2007 | 140,228 | | 0 | 78,943 | 56 | 78,943 | 56 |
| 2008 | 28,730 | 779- | 3- | | 0 | 779 | 3 |
| 2009 | 534,814 | 40,146- | 8- | | 0 | 40,146 | 8 |
| 2010 | | | | | | | |
| 2011 | 101,785 | 1,051- | 1- | | 0 | 1,051 | 1 |
| 2012 | | | | | | | |
| 2013 | 1,101,157 | 138,101- | 13- | | 0 | 138,101 | 13 |
| 2014 | | | | | | | |
| 2015 | 5,524 | | 0 | | 0 | | 0 |
| 2016 | 150,028 | | 0 | | 0 | | 0 |
| 2017 | 13,315 | | 0 | | 0 | | 0 |
| 2018 | 25,196 | | 0 | | 0 | | 0 |
| TOTAL | 2,878,530 | 131,808- | 5- | 119,521 | 4 | 251,329 | 9 |

THREE-YEAR MOVING AVERAGES

| | | | | | | | |
|-------|---------|---------|-----|--------|----|--------|-----|
| 98-00 | 17,704 | 16,070 | 91 | 6,080 | 34 | 9,990- | 56- |
| 99-01 | 79,514 | | 0 | | 0 | | 0 |
| 00-02 | 164,142 | | 0 | | 0 | | 0 |
| 01-03 | 164,246 | 20 | 0 | | 0 | 20- | 0 |
| 02-04 | 131,631 | 20 | 0 | 7,446 | 6 | 7,426 | 6 |
| 03-05 | 47,003 | 20 | 0 | 7,446 | 16 | 7,426 | 16 |
| 04-06 | 77,301 | | 0 | 7,446 | 10 | 7,446 | 10 |
| 05-07 | 77,145 | | 0 | 26,314 | 34 | 26,314 | 34 |
| 06-08 | 86,721 | 260- | 0 | 26,314 | 30 | 26,574 | 31 |
| 07-09 | 234,591 | 13,641- | 6- | 26,314 | 11 | 39,956 | 17 |
| 08-10 | 187,848 | 13,641- | 7- | | 0 | 13,641 | 7 |
| 09-11 | 212,200 | 13,732- | 6- | | 0 | 13,732 | 6 |
| 10-12 | 33,928 | 350- | 1- | | 0 | 350 | 1 |
| 11-13 | 400,981 | 46,384- | 12- | | 0 | 46,384 | 12 |
| 12-14 | 367,052 | 46,034- | 13- | | 0 | 46,034 | 13 |
| 13-15 | 368,894 | 46,034- | 12- | | 0 | 46,034 | 12 |

THREE-YEAR MOVING AVERAGES

| | | | | |
|-------|--------|---|---|---|
| 14-16 | 51,851 | 0 | 0 | 0 |
| 15-17 | 56,289 | 0 | 0 | 0 |
| 16-18 | 62,847 | 0 | 0 | 0 |

FIVE-YEAR AVERAGE

| | | | | |
|-------|--------|---|---|---|
| 14-18 | 38,813 | 0 | 0 | 0 |
|-------|--------|---|---|---|

COLSTRIP 3
 INTERIM SURVIVOR CURVE.. IOWA 90-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|------|---------------|------------|------------|------------|------|-----------|
| 1984 | 27,381,168.87 | 25,733,573 | 21,307,558 | 9,906,974 | 6.89 | 1,437,877 |
| 1985 | 26,678.07 | 24,952 | 20,660 | 9,753 | 6.89 | 1,416 |
| 1988 | 40,746.65 | 37,476 | 31,030 | 15,421 | 6.90 | 2,235 |
| 1989 | 36,723.62 | 33,569 | 27,795 | 14,070 | 6.90 | 2,039 |
| 1990 | 40,585.61 | 36,842 | 30,505 | 15,762 | 6.91 | 2,281 |
| 1991 | 23,738.14 | 21,398 | 17,718 | 9,344 | 6.91 | 1,352 |
| 1992 | 18,384.41 | 16,448 | 13,619 | 7,339 | 6.91 | 1,062 |
| 1993 | 13,171.51 | 11,690 | 9,679 | 5,336 | 6.91 | 772 |
| 1994 | 18,277.57 | 16,083 | 13,317 | 7,520 | 6.91 | 1,088 |
| 1995 | 6,603.86 | 5,755 | 4,765 | 2,763 | 6.92 | 399 |
| 1996 | 4,662.39 | 4,022 | 3,330 | 1,985 | 6.92 | 287 |
| 1997 | 13,527.64 | 11,545 | 9,559 | 5,862 | 6.92 | 847 |
| 1999 | 44,169.20 | 36,779 | 30,453 | 19,900 | 6.92 | 2,876 |
| 2000 | 9,137.57 | 7,503 | 6,213 | 4,204 | 6.92 | 608 |
| 2001 | 8,433.50 | 6,815 | 5,643 | 3,971 | 6.93 | 573 |
| 2002 | 22,064.46 | 17,528 | 14,513 | 10,640 | 6.93 | 1,535 |
| 2003 | 38,943.58 | 30,360 | 25,138 | 19,257 | 6.93 | 2,779 |
| 2004 | 35,428.78 | 27,048 | 22,396 | 17,993 | 6.93 | 2,596 |
| 2005 | 38,432.52 | 28,655 | 23,727 | 20,087 | 6.93 | 2,899 |
| 2006 | 34,005.69 | 24,679 | 20,434 | 18,332 | 6.93 | 2,645 |
| 2007 | 10,591.87 | 7,457 | 6,174 | 5,900 | 6.93 | 851 |
| 2008 | 79,296.11 | 53,838 | 44,578 | 45,819 | 6.94 | 6,602 |
| 2009 | 100,503.08 | 65,490 | 54,226 | 60,347 | 6.94 | 8,696 |
| 2010 | 88,441.66 | 54,910 | 45,466 | 55,358 | 6.94 | 7,977 |
| 2011 | 146,972.41 | 86,065 | 71,262 | 96,286 | 6.94 | 13,874 |
| 2012 | 301,926.63 | 164,595 | 136,286 | 207,911 | 6.94 | 29,958 |
| 2013 | 162,658.06 | 81,061 | 67,119 | 118,311 | 6.94 | 17,048 |
| 2014 | 202,771.84 | 89,940 | 74,471 | 156,689 | 6.94 | 22,578 |
| 2016 | 54,454.95 | 16,229 | 13,438 | 48,641 | 6.95 | 6,999 |
| 2017 | 563,664.50 | 112,811 | 93,408 | 549,169 | 6.95 | 79,017 |
| 2018 | 421,007.21 | 31,609 | 26,172 | 453,776 | 6.95 | 65,292 |
| | 29,987,171.96 | 26,896,725 | 22,270,656 | 11,914,720 | | 1,727,058 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 90-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|------|---------------|------------|------------|------------|------|-----------|
| 1986 | 25,800,020.36 | 23,998,740 | 19,519,125 | 9,892,899 | 6.90 | 1,433,753 |
| 1987 | 96,846.79 | 89,592 | 72,869 | 37,537 | 6.90 | 5,440 |
| 1988 | 90,745.02 | 83,461 | 67,882 | 35,567 | 6.90 | 5,155 |
| 1989 | 36,723.61 | 33,569 | 27,303 | 14,562 | 6.90 | 2,110 |
| 1990 | 44,084.28 | 40,018 | 32,548 | 17,708 | 6.91 | 2,563 |
| 1994 | 7,517.08 | 6,615 | 5,380 | 3,189 | 6.91 | 462 |
| 1995 | 6,603.81 | 5,755 | 4,681 | 2,848 | 6.92 | 412 |
| 1996 | 11,154.56 | 9,623 | 7,827 | 4,889 | 6.92 | 707 |
| 1997 | 2,104.68 | 1,796 | 1,461 | 939 | 6.92 | 136 |
| 1999 | 44,169.15 | 36,779 | 29,914 | 20,439 | 6.92 | 2,954 |
| 2000 | 9,137.57 | 7,503 | 6,102 | 4,314 | 6.92 | 623 |
| 2001 | 8,433.50 | 6,815 | 5,543 | 4,071 | 6.93 | 587 |
| 2002 | 22,064.46 | 17,528 | 14,256 | 10,897 | 6.93 | 1,572 |
| 2003 | 12,112.58 | 9,443 | 7,680 | 6,128 | 6.93 | 884 |
| 2004 | 990.81 | 756 | 615 | 515 | 6.93 | 74 |
| 2005 | 38,430.50 | 28,653 | 23,305 | 20,506 | 6.93 | 2,959 |
| 2006 | 34,005.69 | 24,679 | 20,072 | 18,694 | 6.93 | 2,698 |
| 2007 | 10,591.87 | 7,457 | 6,065 | 6,010 | 6.93 | 867 |
| 2008 | 79,296.11 | 53,838 | 43,789 | 46,609 | 6.94 | 6,716 |
| 2009 | 100,503.08 | 65,490 | 53,266 | 61,308 | 6.94 | 8,834 |
| 2010 | 88,441.66 | 54,910 | 44,660 | 56,163 | 6.94 | 8,093 |
| 2011 | 146,972.41 | 86,065 | 70,000 | 97,548 | 6.94 | 14,056 |
| 2012 | 229,714.54 | 125,228 | 101,853 | 160,022 | 6.94 | 23,058 |
| 2013 | 217,296.96 | 108,290 | 88,077 | 159,642 | 6.94 | 23,003 |
| 2014 | 239,140.70 | 106,071 | 86,272 | 186,349 | 6.94 | 26,851 |
| 2016 | 162,096.85 | 48,308 | 39,291 | 145,500 | 6.95 | 20,935 |
| 2017 | 117,592.49 | 23,535 | 19,142 | 114,913 | 6.95 | 16,534 |
| 2018 | 467,525.51 | 35,102 | 28,550 | 504,429 | 6.95 | 72,580 |
| | 28,124,316.63 | 25,115,619 | 20,427,526 | 11,634,194 | | 1,684,616 |

COLSTRIP 3-4
 INTERIM SURVIVOR CURVE.. IOWA 90-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|------|--------------|-----------|-----------|---------|------|---------|
| 1975 | 2,225,303.29 | 2,165,477 | 1,739,175 | 797,671 | 6.87 | 116,109 |
| 1976 | 513,674.85 | 498,301 | 400,204 | 185,385 | 6.87 | 26,985 |
| 1977 | 213,311.03 | 206,256 | 165,652 | 77,523 | 6.87 | 11,284 |

COLSTRIP 3-4
 INTERIM SURVIVOR CURVE.. IOWA 90-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | | |
|------|--|-------------|------------|------------|------|-----------|------|
| 1979 | 212,064.19 | 203,571 | 163,495 | 78,258 | 6.88 | 11,375 | |
| 1980 | 21,555.05 | 20,614 | 16,556 | 8,017 | 6.88 | 1,165 | |
| 1984 | 25,537,252.92 | 24,000,610 | 19,275,782 | 9,836,686 | 6.89 | 1,427,676 | |
| 1985 | 43,907.44 | 41,066 | 32,982 | 17,073 | 6.89 | 2,478 | |
| 1986 | 40,474,615.47 | 37,648,799 | 30,237,150 | 15,903,911 | 6.90 | 2,304,915 | |
| 1987 | 85,321.53 | 78,930 | 63,392 | 33,875 | 6.90 | 4,909 | |
| 1988 | 88,601.25 | 81,489 | 65,447 | 35,559 | 6.90 | 5,153 | |
| 1989 | 148,420.80 | 135,671 | 108,962 | 60,237 | 6.90 | 8,730 | |
| 1990 | 75,255.07 | 68,314 | 54,866 | 30,925 | 6.91 | 4,475 | |
| 1991 | 138,386.13 | 124,746 | 100,188 | 57,572 | 6.91 | 8,332 | |
| 1992 | 32,366.36 | 28,957 | 23,256 | 13,641 | 6.91 | 1,974 | |
| 1993 | 10,999.65 | 9,762 | 7,840 | 4,699 | 6.91 | 680 | |
| 1994 | 27,709.58 | 24,383 | 19,583 | 12,006 | 6.91 | 1,737 | |
| 1995 | 24,010.33 | 20,923 | 16,804 | 10,568 | 6.92 | 1,527 | |
| 1996 | 18,640.99 | 16,082 | 12,916 | 8,335 | 6.92 | 1,204 | |
| 1997 | 56,430.97 | 48,161 | 38,680 | 25,651 | 6.92 | 3,707 | |
| 1999 | 8,231.36 | 6,854 | 5,505 | 3,879 | 6.92 | 561 | |
| 2000 | 61,354.93 | 50,380 | 40,462 | 29,483 | 6.92 | 4,261 | |
| 2002 | 23,704.70 | 18,831 | 15,124 | 11,899 | 6.93 | 1,717 | |
| | 70,041,117.89 | 65,498,177 | 52,604,022 | 27,242,853 | | 3,950,954 | |
| | 128,152,606.48 | 117,510,521 | 95,302,204 | 50,791,767 | | 7,362,628 | |
| | COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. | | | | | 6.9 | 5.75 |

COLSTRIP 3
 INTERIM SURVIVOR CURVE.. IOWA 75-R1
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|------|----------------|-------------|------------|------------|------|------------|
| 1984 | 104,925,322.70 | 97,995,677 | 78,323,109 | 41,291,759 | 6.83 | 6,045,646 |
| 1990 | 105,193.32 | 94,929 | 75,872 | 44,048 | 6.85 | 6,430 |
| 1991 | 191,102.56 | 171,266 | 136,884 | 80,972 | 6.85 | 11,821 |
| 1992 | 72,727.91 | 64,695 | 51,708 | 31,202 | 6.85 | 4,555 |
| 1993 | 49,149.23 | 43,357 | 34,653 | 21,377 | 6.86 | 3,116 |
| 1995 | 80,802.94 | 70,028 | 55,970 | 36,145 | 6.86 | 5,269 |
| 1996 | 70,978.88 | 60,876 | 48,655 | 32,261 | 6.87 | 4,696 |
| 1999 | 71,051.54 | 58,829 | 47,019 | 33,980 | 6.87 | 4,946 |
| 2001 | 1,973,991.96 | 1,586,430 | 1,267,955 | 982,396 | 6.88 | 142,790 |
| 2002 | 720,906.59 | 569,637 | 455,283 | 366,551 | 6.88 | 53,278 |
| 2003 | 1,793,182.78 | 1,390,382 | 1,111,264 | 932,965 | 6.88 | 135,605 |
| 2004 | 873,181.66 | 662,974 | 529,882 | 465,545 | 6.88 | 67,666 |
| 2005 | 763,438.12 | 565,777 | 452,198 | 418,122 | 6.89 | 60,685 |
| 2006 | 753,276.57 | 543,511 | 434,402 | 424,334 | 6.89 | 61,587 |
| 2007 | 3,490,882.29 | 2,443,518 | 1,952,983 | 2,026,622 | 6.89 | 294,140 |
| 2008 | 1,333,531.10 | 901,174 | 720,264 | 799,962 | 6.89 | 116,105 |
| 2009 | 1,188,025.13 | 770,773 | 616,041 | 738,308 | 6.89 | 107,156 |
| 2010 | 1,089,758.59 | 672,756 | 537,701 | 704,624 | 6.90 | 102,119 |
| 2011 | 1,633,894.25 | 951,790 | 760,719 | 1,101,921 | 6.90 | 159,699 |
| 2012 | 1,438,976.31 | 780,321 | 623,672 | 1,016,761 | 6.90 | 147,357 |
| 2013 | 2,516,917.97 | 1,247,824 | 997,324 | 1,871,962 | 6.90 | 271,299 |
| 2014 | 7,433,963.17 | 3,281,496 | 2,622,738 | 5,851,980 | 6.90 | 848,113 |
| 2015 | 21,249.98 | 7,973 | 6,372 | 17,853 | 6.91 | 2,584 |
| 2016 | 3,919,244.44 | 1,162,424 | 929,068 | 3,538,871 | 6.91 | 512,138 |
| 2017 | 8,667,459.32 | 1,723,526 | 1,377,529 | 8,503,374 | 6.91 | 1,230,590 |
| 2018 | 1,930,016.40 | 145,698 | 116,449 | 2,083,769 | 6.91 | 301,558 |
| | 147,108,225.71 | 117,967,641 | 94,285,715 | 73,417,663 | | 10,700,948 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 75-R1
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|------|---------------|------------|------------|------------|------|-----------|
| 1986 | 94,255,995.52 | 87,138,066 | 67,450,341 | 40,001,494 | 6.84 | 5,848,172 |
| 1987 | 51,568.79 | 47,416 | 36,703 | 22,085 | 6.84 | 3,229 |
| 1988 | 84,499.19 | 77,247 | 59,794 | 36,535 | 6.84 | 5,341 |
| 1989 | 41,118.52 | 37,350 | 28,911 | 17,964 | 6.85 | 2,622 |
| 1990 | 198,903.86 | 179,496 | 138,941 | 87,809 | 6.85 | 12,819 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 75-R1
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|------|----------------|-------------|------------|------------|------|-----------|
| 1991 | 332,169.19 | 297,690 | 230,431 | 148,242 | 6.85 | 21,641 |
| 1992 | 282,205.38 | 251,037 | 194,318 | 127,396 | 6.85 | 18,598 |
| 1993 | 32,505.34 | 28,675 | 22,196 | 14,860 | 6.86 | 2,166 |
| 1994 | 66,714.02 | 58,350 | 45,167 | 30,887 | 6.86 | 4,502 |
| 1995 | 102,210.02 | 88,580 | 68,566 | 47,953 | 6.86 | 6,990 |
| 1996 | 207,718.93 | 178,154 | 137,902 | 98,897 | 6.87 | 14,395 |
| 1999 | 249,067.80 | 206,221 | 159,628 | 124,309 | 6.87 | 18,094 |
| 2000 | 434,554.59 | 354,815 | 274,649 | 220,743 | 6.87 | 32,131 |
| 2001 | 187,887.20 | 150,999 | 116,883 | 97,309 | 6.88 | 14,144 |
| 2002 | 1,486,472.43 | 1,174,563 | 909,186 | 785,393 | 6.88 | 114,156 |
| 2003 | 2,170,593.52 | 1,683,015 | 1,302,759 | 1,171,717 | 6.88 | 170,308 |
| 2004 | 350,874.87 | 266,406 | 206,215 | 193,782 | 6.88 | 28,166 |
| 2005 | 1,207,311.36 | 894,728 | 692,576 | 683,759 | 6.89 | 99,239 |
| 2006 | 753,757.22 | 543,858 | 420,980 | 438,303 | 6.89 | 63,614 |
| 2007 | 783,770.41 | 548,617 | 424,664 | 468,834 | 6.89 | 68,046 |
| 2008 | 1,215,388.47 | 821,336 | 635,766 | 749,777 | 6.89 | 108,821 |
| 2009 | 3,505,569.44 | 2,274,362 | 1,760,499 | 2,235,850 | 6.89 | 324,507 |
| 2010 | 1,022,408.64 | 631,178 | 488,571 | 676,974 | 6.90 | 98,112 |
| 2011 | 1,125,658.89 | 655,728 | 507,575 | 775,676 | 6.90 | 112,417 |
| 2012 | 950,928.79 | 515,665 | 399,157 | 684,902 | 6.90 | 99,261 |
| 2013 | 3,709,774.03 | 1,839,212 | 1,423,666 | 2,805,477 | 6.90 | 406,591 |
| 2014 | 2,369,255.75 | 1,045,835 | 809,542 | 1,891,410 | 6.90 | 274,117 |
| 2016 | 8,772,600.58 | 2,601,899 | 2,014,033 | 7,986,731 | 6.91 | 1,155,822 |
| 2017 | 2,148,042.92 | 427,139 | 330,632 | 2,118,136 | 6.91 | 306,532 |
| 2018 | 1,633,951.93 | 123,348 | 95,479 | 1,767,226 | 6.91 | 255,749 |
| | 129,733,477.60 | 105,140,985 | 81,385,732 | 66,510,433 | | 9,690,302 |

COLSTRIP 3-4
 INTERIM SURVIVOR CURVE.. IOWA 75-R1
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|------|--------------|-----------|-----------|-----------|------|---------|
| 1975 | 0.25 | | 0 | | | |
| 1977 | 0.64 | 1 | 1 | | | |
| 1984 | 5,532,850.99 | 5,167,442 | 3,230,921 | 3,076,529 | 6.83 | 450,443 |
| 1985 | 65.39 | 61 | 38 | 36 | 6.83 | 5 |
| 1986 | 9,039,312.23 | 8,356,690 | 5,224,985 | 5,079,831 | 6.84 | 742,665 |
| 1987 | 173,925.27 | 159,921 | 99,990 | 98,285 | 6.84 | 14,369 |

COLSTRIP 3-4
 INTERIM SURVIVOR CURVE.. IOWA 75-R1
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -14

| | | | | | | |
|--|----------------|-------------|-------------|-------------|------|------------|
| 1988 | 39,365.85 | 35,987 | 22,501 | 22,376 | 6.84 | 3,271 |
| 1989 | 226,649.96 | 205,878 | 128,724 | 129,657 | 6.85 | 18,928 |
| 1990 | 52,601.12 | 47,469 | 29,680 | 30,285 | 6.85 | 4,421 |
| 1991 | 63,115.08 | 56,564 | 35,366 | 36,585 | 6.85 | 5,341 |
| 1992 | 292.69 | 260 | 163 | 171 | 6.85 | 25 |
| 1993 | 655.10 | 578 | 361 | 385 | 6.86 | 56 |
| 2000 | 2,326.04 | 1,899 | 1,187 | 1,464 | 6.87 | 213 |
| 2001 | 38,099.22 | 30,619 | 19,144 | 24,289 | 6.88 | 3,530 |
| 2002 | 2,558.95 | 2,022 | 1,264 | 1,653 | 6.88 | 240 |
| | 15,171,818.78 | 14,065,391 | 8,794,326 | 8,501,547 | | 1,243,507 |
| | 292,013,522.09 | 237,174,017 | 184,465,773 | 148,429,643 | | 21,634,757 |
| COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. | | | | | | 6.9 7.41 |

COLSTRIP 3
 INTERIM SURVIVOR CURVE.. IOWA 45-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|---------------|------------|------------|------------|------|-----------|
| 1984 | 21,538,507.50 | 19,881,888 | 10,196,770 | 14,141,744 | 6.46 | 2,189,124 |
| 1985 | 30,849.56 | 28,344 | 14,537 | 20,323 | 6.48 | 3,136 |
| 1988 | 35,453.82 | 32,033 | 16,429 | 23,634 | 6.56 | 3,603 |
| 1989 | 37,619.05 | 33,785 | 17,327 | 25,182 | 6.58 | 3,827 |
| 1990 | 33,063.67 | 29,499 | 15,129 | 22,233 | 6.60 | 3,369 |
| 1991 | 117,800.93 | 104,364 | 53,525 | 79,590 | 6.62 | 12,023 |
| 1992 | 806,130.85 | 708,839 | 363,540 | 547,388 | 6.64 | 82,438 |
| 1995 | 2,438,890.18 | 2,089,861 | 1,071,821 | 1,684,125 | 6.69 | 251,738 |
| 1998 | 69,806.29 | 57,907 | 29,699 | 49,183 | 6.73 | 7,308 |
| 1999 | 47,490.74 | 38,879 | 19,940 | 33,725 | 6.75 | 4,996 |
| 2001 | 373,130.83 | 296,660 | 152,147 | 269,491 | 6.77 | 39,807 |
| 2002 | 21,382.71 | 16,713 | 8,572 | 15,591 | 6.78 | 2,300 |
| 2004 | 2,472,961.10 | 1,857,440 | 952,620 | 1,841,826 | 6.80 | 270,857 |
| 2005 | 449,615.64 | 329,719 | 169,102 | 338,964 | 6.81 | 49,774 |
| 2006 | 2,012,909.24 | 1,436,971 | 736,975 | 1,537,612 | 6.82 | 225,456 |
| 2007 | 263,885.83 | 182,839 | 93,772 | 204,419 | 6.82 | 29,973 |
| 2008 | 123,710.86 | 82,723 | 42,426 | 97,367 | 6.83 | 14,256 |
| 2009 | 910,752.85 | 584,465 | 299,753 | 729,398 | 6.84 | 106,637 |
| 2010 | 2,298,393.37 | 1,404,765 | 720,458 | 1,876,726 | 6.85 | 273,975 |
| 2011 | 3,797,455.35 | 2,191,520 | 1,123,959 | 3,167,166 | 6.85 | 462,360 |
| 2012 | 1,090,780.18 | 585,636 | 300,354 | 932,228 | 6.86 | 135,893 |
| 2013 | 499,714.85 | 245,127 | 125,718 | 438,960 | 6.87 | 63,895 |
| 2014 | 65,633.20 | 28,673 | 14,705 | 59,460 | 6.87 | 8,655 |
| 2016 | 22,376.39 | 6,580 | 3,375 | 21,911 | 6.88 | 3,185 |
| 2017 | 2,543,325.35 | 499,666 | 256,262 | 2,617,695 | 6.89 | 379,927 |
| 2018 | 68,383.35 | 5,131 | 2,632 | 74,642 | 6.89 | 10,833 |
| | 42,170,023.69 | 32,760,027 | 16,801,546 | 30,850,581 | | 4,639,345 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 45-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|---------------|------------|------------|------------|------|-----------|
| 1986 | 19,316,962.72 | 17,653,531 | 10,528,520 | 11,299,648 | 6.51 | 1,735,737 |
| 1987 | 17,135.97 | 15,578 | 9,291 | 10,073 | 6.53 | 1,543 |
| 1988 | 21,587.45 | 19,505 | 11,633 | 12,761 | 6.56 | 1,945 |
| 1989 | 45,279.81 | 40,665 | 24,253 | 26,914 | 6.58 | 4,090 |
| 1990 | 31,492.65 | 28,097 | 16,757 | 18,830 | 6.60 | 2,853 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 45-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|---------------|------------|------------|------------|------|-----------|
| 1991 | 47,229.85 | 41,842 | 24,954 | 28,415 | 6.62 | 4,292 |
| 1992 | 32,776.89 | 28,821 | 17,189 | 19,849 | 6.64 | 2,989 |
| 1993 | 39,894.13 | 34,795 | 20,752 | 24,329 | 6.66 | 3,653 |
| 1994 | 125,329.29 | 108,358 | 64,624 | 76,998 | 6.68 | 11,527 |
| 1995 | 1,003,596.83 | 859,972 | 512,885 | 621,179 | 6.69 | 92,852 |
| 1996 | 2,244,257.93 | 1,903,429 | 1,135,200 | 1,400,811 | 6.71 | 208,765 |
| 1998 | 58,190.37 | 48,271 | 28,789 | 36,966 | 6.73 | 5,493 |
| 1999 | 225,990.70 | 185,013 | 110,341 | 145,028 | 6.75 | 21,486 |
| 2000 | 458,576.69 | 370,201 | 220,787 | 297,405 | 6.76 | 43,995 |
| 2001 | 406,675.49 | 323,330 | 192,833 | 266,710 | 6.77 | 39,396 |
| 2002 | 196,162.03 | 153,320 | 91,440 | 130,223 | 6.78 | 19,207 |
| 2003 | 350,505.19 | 268,857 | 160,346 | 235,725 | 6.79 | 34,716 |
| 2004 | 1,785,046.74 | 1,340,748 | 799,619 | 1,217,484 | 6.80 | 179,042 |
| 2005 | 1,344,136.28 | 985,704 | 587,871 | 931,003 | 6.81 | 136,711 |
| 2006 | 2,047,035.18 | 1,461,332 | 871,535 | 1,441,615 | 6.82 | 211,380 |
| 2007 | 316,633.99 | 219,386 | 130,841 | 226,955 | 6.82 | 33,278 |
| 2008 | 97,347.84 | 65,094 | 38,822 | 71,181 | 6.83 | 10,422 |
| 2009 | 1,991,138.87 | 1,277,790 | 762,071 | 1,487,916 | 6.84 | 217,532 |
| 2010 | 422,946.59 | 258,503 | 154,171 | 323,759 | 6.85 | 47,264 |
| 2011 | 116,239.83 | 67,082 | 40,008 | 91,343 | 6.85 | 13,335 |
| 2012 | 254,687.05 | 136,741 | 81,552 | 206,244 | 6.86 | 30,065 |
| 2013 | 217,636.62 | 106,758 | 63,670 | 182,259 | 6.87 | 26,530 |
| 2014 | 2,617,280.64 | 1,143,410 | 681,927 | 2,275,600 | 6.87 | 331,237 |
| 2016 | 3,106,880.98 | 913,574 | 544,853 | 2,965,922 | 6.88 | 431,093 |
| 2017 | 66,267.91 | 13,019 | 7,764 | 67,118 | 6.89 | 9,741 |
| 2018 | 951,439.18 | 71,388 | 42,576 | 1,032,551 | 6.89 | 149,862 |
| | 39,956,361.69 | 30,144,114 | 17,977,871 | 27,172,817 | | 4,062,031 |
| | 82,126,385.38 | 62,904,141 | 34,779,417 | 58,023,398 | | 8,701,376 |

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 6.7 10.60

COLSTRIP 3
 INTERIM SURVIVOR CURVE.. IOWA 60-S2
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|--------------|-----------|-----------|-----------|------|---------|
| 1984 | 5,510,486.23 | 5,180,739 | 3,874,459 | 2,352,390 | 6.71 | 350,580 |
| 1993 | 24,008.94 | 21,316 | 15,941 | 11,189 | 6.86 | 1,631 |
| 1994 | 18,089.45 | 15,923 | 11,908 | 8,533 | 6.87 | 1,242 |
| 1995 | 2,395.53 | 2,089 | 1,562 | 1,145 | 6.88 | 166 |
| 1996 | 7,907.78 | 6,827 | 5,106 | 3,830 | 6.89 | 556 |
| 1997 | 10,123.37 | 8,640 | 6,461 | 4,978 | 6.91 | 720 |
| 2003 | 64,645.05 | 50,372 | 37,671 | 35,378 | 6.96 | 5,083 |
| 2006 | 23,771.36 | 17,227 | 12,883 | 13,978 | 6.98 | 2,003 |
| 2007 | 1,777.60 | 1,250 | 935 | 1,074 | 6.98 | 154 |
| 2009 | 19,589.96 | 12,747 | 9,533 | 12,604 | 6.99 | 1,803 |
| 2010 | 24,487.45 | 15,184 | 11,355 | 16,315 | 6.99 | 2,334 |
| 2011 | 56,240.84 | 32,895 | 24,601 | 38,951 | 6.99 | 5,572 |
| 2012 | 21,281.66 | 11,570 | 8,653 | 15,396 | 7.00 | 2,199 |
| 2013 | 58,142.16 | 28,908 | 21,619 | 44,082 | 7.00 | 6,297 |
| 2014 | 6,889.92 | 3,047 | 2,279 | 5,507 | 7.00 | 787 |
| 2016 | 273,627.86 | 81,369 | 60,852 | 248,347 | 7.00 | 35,478 |
| 2017 | 841,881.99 | 167,881 | 125,551 | 825,775 | 7.00 | 117,968 |
| 2018 | 292,276.02 | 22,019 | 16,467 | 313,805 | 7.00 | 44,829 |
| | 7,257,623.17 | 5,680,003 | 4,247,838 | 3,953,276 | | 579,402 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 60-S2
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|--------------|-----------|-----------|-----------|------|---------|
| 1986 | 4,881,733.86 | 4,544,597 | 3,217,447 | 2,298,913 | 6.74 | 341,085 |
| 1988 | 4,731.29 | 4,354 | 3,083 | 2,264 | 6.78 | 334 |
| 1989 | 1,351.38 | 1,236 | 875 | 652 | 6.80 | 96 |
| 1992 | 624.23 | 559 | 396 | 310 | 6.84 | 45 |
| 1993 | 29,047.48 | 25,789 | 18,258 | 14,566 | 6.86 | 2,123 |
| 1995 | 2,395.49 | 2,089 | 1,479 | 1,228 | 6.88 | 178 |
| 1996 | 7,871.97 | 6,796 | 4,811 | 4,084 | 6.89 | 593 |
| 2000 | 7,344.72 | 6,027 | 4,267 | 4,033 | 6.94 | 581 |
| 2003 | 64,645.05 | 50,372 | 35,662 | 37,387 | 6.96 | 5,372 |
| 2006 | 8,218.37 | 5,956 | 4,217 | 5,070 | 6.98 | 726 |
| 2007 | 1,776.59 | 1,249 | 884 | 1,123 | 6.98 | 161 |
| 2011 | 14,380.68 | 8,411 | 5,955 | 10,295 | 6.99 | 1,473 |
| 2012 | 62,951.27 | 34,223 | 24,229 | 46,906 | 7.00 | 6,701 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 60-S2
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|--------------|-----------|-----------|-----------|------|---------|
| 2013 | 181,804.95 | 90,393 | 63,996 | 141,444 | 7.00 | 20,206 |
| 2014 | 61,758.68 | 27,308 | 19,333 | 50,454 | 7.00 | 7,208 |
| 2016 | 538,878.79 | 160,247 | 113,450 | 495,483 | 7.00 | 70,783 |
| 2017 | 434,390.84 | 86,622 | 61,326 | 429,536 | 7.00 | 61,362 |
| 2018 | 263,889.14 | 19,881 | 14,075 | 284,120 | 7.00 | 40,589 |
| | 6,567,794.78 | 5,076,109 | 3,593,742 | 3,827,866 | | 559,616 |

COLSTRIP 3-4
 INTERIM SURVIVOR CURVE.. IOWA 60-S2
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|---------------|------------|------------|------------|------|-----------|
| 1984 | 3,222,042.93 | 3,029,236 | 2,504,544 | 1,136,365 | 6.71 | 169,354 |
| 1986 | 4,189,433.03 | 3,900,107 | 3,224,572 | 1,509,488 | 6.74 | 223,960 |
| 1987 | 33,048.20 | 30,594 | 25,295 | 12,050 | 6.76 | 1,783 |
| 1988 | 56,551.22 | 52,043 | 43,029 | 20,874 | 6.78 | 3,079 |
| 1989 | 21,989.74 | 20,107 | 16,624 | 8,224 | 6.80 | 1,209 |
| 1990 | 17,735.13 | 16,113 | 13,322 | 6,719 | 6.81 | 987 |
| 1991 | 12,774.85 | 11,523 | 9,527 | 4,908 | 6.83 | 719 |
| 1992 | 876.29 | 785 | 649 | 341 | 6.84 | 50 |
| 1993 | 7,324.34 | 6,503 | 5,377 | 2,900 | 6.86 | 423 |
| 1997 | 3,370.01 | 2,876 | 2,378 | 1,430 | 6.91 | 207 |
| 1998 | 31,824.16 | 26,843 | 22,194 | 13,768 | 6.92 | 1,990 |
| 1999 | 42,036.34 | 34,994 | 28,933 | 18,568 | 6.93 | 2,679 |
| | 7,639,006.24 | 7,131,724 | 5,896,442 | 2,735,635 | | 406,440 |
| | 21,464,424.19 | 17,887,836 | 13,738,022 | 10,516,777 | | 1,545,458 |

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COLSTRIP 3
 INTERIM SURVIVOR CURVE.. IOWA 50-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|--------------|---------|---------|---------|------|---------|
| 1984 | 254,187.37 | 235,030 | 149,502 | 137,730 | 6.59 | 20,900 |
| 1985 | 16,047.01 | 14,764 | 9,391 | 8,742 | 6.61 | 1,323 |
| 1988 | 12,879.17 | 11,657 | 7,415 | 7,138 | 6.66 | 1,072 |
| 1989 | 21,831.81 | 19,635 | 12,490 | 12,180 | 6.68 | 1,823 |
| 1993 | 14,695.68 | 12,839 | 8,167 | 8,439 | 6.73 | 1,254 |
| 1994 | 30,884.66 | 26,755 | 17,019 | 17,881 | 6.74 | 2,653 |
| 1995 | 5,173.07 | 4,438 | 2,823 | 3,023 | 6.76 | 447 |
| 1996 | 5,435.53 | 4,617 | 2,937 | 3,205 | 6.77 | 473 |
| 1997 | 3,151.50 | 2,648 | 1,684 | 1,877 | 6.78 | 277 |
| 1998 | 15,509.76 | 12,879 | 8,192 | 9,334 | 6.79 | 1,375 |
| 1999 | 24,270.29 | 19,908 | 12,663 | 14,762 | 6.79 | 2,174 |
| 2001 | 38,463.83 | 30,628 | 19,482 | 23,982 | 6.81 | 3,522 |
| 2003 | 18,395.13 | 14,124 | 8,984 | 11,802 | 6.83 | 1,728 |
| 2004 | 17,185.15 | 12,927 | 8,223 | 11,196 | 6.83 | 1,639 |
| 2005 | 10,294.02 | 7,560 | 4,809 | 6,823 | 6.84 | 998 |
| 2006 | 132,193.85 | 94,484 | 60,101 | 89,278 | 6.85 | 13,033 |
| 2007 | 38,942.57 | 27,013 | 17,183 | 26,822 | 6.85 | 3,916 |
| 2008 | 74,337.01 | 49,761 | 31,653 | 52,348 | 6.86 | 7,631 |
| 2009 | 32,697.74 | 21,017 | 13,369 | 23,580 | 6.86 | 3,437 |
| 2010 | 3,830.93 | 2,345 | 1,492 | 2,837 | 6.87 | 413 |
| 2011 | 12,771.59 | 7,380 | 4,694 | 9,738 | 6.87 | 1,417 |
| 2012 | 239.34 | 129 | 82 | 188 | 6.88 | 27 |
| 2013 | 593.17 | 292 | 186 | 485 | 6.88 | 70 |
| 2014 | 195,389.47 | 85,327 | 54,276 | 166,514 | 6.89 | 24,167 |
| 2016 | 66,084.08 | 19,390 | 12,334 | 62,341 | 6.90 | 9,035 |
| 2017 | 22,859.23 | 4,511 | 2,869 | 22,962 | 6.90 | 3,328 |
| 2018 | 1,490.57 | 112 | 71 | 1,613 | 6.90 | 234 |
| | 1,069,833.53 | 742,170 | 472,091 | 736,821 | | 108,366 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 50-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|------------|---------|---------|---------|------|--------|
| 1986 | 386,142.22 | 353,423 | 217,347 | 218,993 | 6.63 | 33,031 |
| 1987 | 38,284.28 | 34,844 | 21,428 | 21,833 | 6.65 | 3,283 |
| 1988 | 4,878.18 | 4,415 | 2,715 | 2,797 | 6.66 | 420 |
| 1989 | 23,739.12 | 21,350 | 13,130 | 13,695 | 6.68 | 2,050 |

COLSTRIP 4
 INTERIM SURVIVOR CURVE.. IOWA 50-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|--------------|---------|---------|---------|------|---------|
| 1993 | 5,047.08 | 4,410 | 2,712 | 2,991 | 6.73 | 444 |
| 1994 | 18,821.27 | 16,305 | 10,027 | 11,241 | 6.74 | 1,668 |
| 1995 | 6,290.17 | 5,397 | 3,319 | 3,789 | 6.76 | 561 |
| 1996 | 1,632.61 | 1,387 | 853 | 992 | 6.77 | 147 |
| 1997 | 3,164.26 | 2,659 | 1,635 | 1,940 | 6.78 | 286 |
| 1998 | 15,492.90 | 12,865 | 7,912 | 9,595 | 6.79 | 1,413 |
| 1999 | 22,993.70 | 18,860 | 11,598 | 14,384 | 6.79 | 2,118 |
| 2001 | 38,463.83 | 30,628 | 18,836 | 24,629 | 6.81 | 3,617 |
| 2003 | 18,396.14 | 14,125 | 8,687 | 12,101 | 6.83 | 1,772 |
| 2004 | 17,189.19 | 12,930 | 7,952 | 11,472 | 6.83 | 1,680 |
| 2005 | 10,295.03 | 7,561 | 4,650 | 6,984 | 6.84 | 1,021 |
| 2006 | 132,193.85 | 94,484 | 58,106 | 91,273 | 6.85 | 13,325 |
| 2007 | 39,886.35 | 27,668 | 17,015 | 28,056 | 6.85 | 4,096 |
| 2008 | 72,912.48 | 48,808 | 30,016 | 52,375 | 6.86 | 7,635 |
| 2009 | 32,697.74 | 21,017 | 12,925 | 24,023 | 6.86 | 3,502 |
| 2010 | 3,830.93 | 2,345 | 1,442 | 2,887 | 6.87 | 420 |
| 2011 | 12,771.59 | 7,380 | 4,539 | 9,893 | 6.87 | 1,440 |
| 2012 | 1,578.10 | 848 | 522 | 1,262 | 6.88 | 183 |
| 2013 | 19,000.01 | 9,342 | 5,745 | 15,725 | 6.88 | 2,286 |
| 2014 | 178,989.15 | 78,165 | 48,070 | 154,188 | 6.89 | 22,379 |
| 2016 | 62,483.77 | 18,334 | 11,275 | 59,332 | 6.90 | 8,599 |
| 2017 | 22,859.23 | 4,511 | 2,774 | 23,057 | 6.90 | 3,342 |
| 2018 | 1,490.56 | 112 | 69 | 1,615 | 6.90 | 234 |
| | 1,191,523.74 | 854,173 | 525,298 | 821,124 | | 120,952 |

COLSTRIP 1-4
 INTERIM SURVIVOR CURVE.. IOWA 50-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|------------|---------|---------|--------|------|--------|
| 1984 | 125,624.66 | 116,157 | 103,885 | 38,071 | 6.59 | 5,777 |
| 1986 | 125,908.90 | 115,240 | 103,065 | 39,212 | 6.63 | 5,914 |
| | 251,533.56 | 231,397 | 206,950 | 77,283 | | 11,691 |

COLSTRIP 3-4
 INTERIM SURVIVOR CURVE.. IOWA 50-R1.5
 PROBABLE RETIREMENT YEAR.. 12-2025
 NET SALVAGE PERCENT.. -13

| | | | | | | |
|------|--------------|-----------|-----------|-----------|------|---------|
| 1975 | 43,951.88 | 42,061 | 33,292 | 16,373 | 6.38 | 2,566 |
| 1976 | 17,622.28 | 16,811 | 13,306 | 6,607 | 6.41 | 1,031 |
| 1977 | 446.36 | 424 | 336 | 169 | 6.44 | 26 |
| 1984 | 743,092.74 | 687,089 | 543,845 | 295,850 | 6.59 | 44,894 |
| 1985 | 118,793.05 | 109,298 | 86,512 | 47,725 | 6.61 | 7,220 |
| 1986 | 1,401,964.64 | 1,283,171 | 1,015,657 | 568,563 | 6.63 | 85,756 |
| 1987 | 46,742.78 | 42,543 | 33,674 | 19,146 | 6.65 | 2,879 |
| 1988 | 78,907.98 | 71,418 | 56,529 | 32,637 | 6.66 | 4,900 |
| 1989 | 115,013.00 | 103,440 | 81,875 | 48,090 | 6.68 | 7,199 |
| 1990 | 118,401.31 | 105,805 | 83,747 | 50,047 | 6.69 | 7,481 |
| 1991 | 208,810.65 | 185,242 | 146,623 | 89,333 | 6.71 | 13,313 |
| 1992 | 230,490.10 | 202,974 | 160,658 | 99,796 | 6.72 | 14,851 |
| 1993 | 246,771.81 | 215,600 | 170,652 | 108,200 | 6.73 | 16,077 |
| 1994 | 324,867.96 | 281,427 | 222,755 | 144,345 | 6.74 | 21,416 |
| 1995 | 118,319.51 | 101,514 | 80,350 | 53,351 | 6.76 | 7,892 |
| 1996 | 80,306.93 | 68,210 | 53,990 | 36,757 | 6.77 | 5,429 |
| 1997 | 76,574.76 | 64,341 | 50,927 | 35,602 | 6.78 | 5,251 |
| 1998 | 108,408.68 | 90,023 | 71,255 | 51,247 | 6.79 | 7,547 |
| 1999 | 124,816.14 | 102,380 | 81,036 | 60,006 | 6.79 | 8,837 |
| 2000 | 111,837.23 | 90,450 | 71,593 | 54,783 | 6.80 | 8,056 |
| 2002 | 9,475.01 | 7,416 | 5,870 | 4,837 | 6.82 | 709 |
| | 4,325,614.80 | 3,871,637 | 3,064,481 | 1,823,463 | | 273,330 |
| | 6,838,505.63 | 5,699,377 | 4,268,820 | 3,458,691 | | 514,339 |

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 6.7 7.52