NATIONAL FLOOD INSURANCE PROGRAM

Actuarial Rate Review

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Background

Floods have been, and continue to be, the most destructive natural hazard in terms of economic loss to the nation. Over the last 30 years, the federal government has had to assume a major financial role in easing the impact of flood damage on individuals and communities. Studies indicate that, although insurance does not and probably cannot respond to all the needs of disaster victims, insurance is the most efficient and equitable method of providing disaster assistance (GAO Report, PAD-80-39). The National Flood Insurance Program (NFIP) provides the means by which flood insurance, over a period of time, can be made available through the cooperative efforts of the federal government and the private insurance industry. In addition, the NFIP can provide the flexibility for such flood insurance to be based on workable methods of pooling risks, minimizing costs, and distributing burdens equitably among those protected by flood insurance and the general public (P.L. 90-448, 83 Stat. 476, Sec. 1301(d)). Loan or grant programs, to the extent that they parallel the insurance mechanism, can undermine the ability of the insurance program to operate efficiently and equitably. The National Flood Insurance Reform Act of 1994 reinforced the objective of using insurance as the preferred mechanism for disaster assistance by expanding mandatory flood insurance purchase requirements and by effecting a prohibition on further flood disaster assistance for any property where flood insurance, after having been mandated as a condition for receiving disaster assistance, is not maintained.

To encourage participation in the NFIP, the Flood Disaster Protection Act of 1973 expanded the authority of the Federal Insurance Administration (FIA)—now the Federal Insurance and Mitigation Administration (FIMA)—to grant premium subsidies as an additional incentive to encourage widespread state, community, and property owner acceptance of program requirements. For the next 7 years, the heavily subsidized premium charges remained in effect. During that period, nearly every community with a flood hazard joined the NFIP, and the insurance policy count increased dramatically, reaching 2 million by 1979. States also responded: governors appointed floodplain management coordinators to assist local communities' governments in working with the FIA on program matters. These actions resulted in establishing, for the first time, a nationwide response to address the flood peril. With the NFIP firmly established, in 1981 the FIA initiated rating and coverage changes through the mid-1980s that placed the program on a fiscally sound basis with significantly less subsidy being provided.

An annual review of experience, with accompanying program revisions, is an integral part of maintaining the NFIP's goal of a fiscally sound rating and coverage structure. In establishing a fiscally sound program, which was achieved in 1988, FIMA has stressed that, as opposed to the traditional insurance definition of fiscal solvency, the NFIP intent is to generate premium at least sufficient to cover expenses and losses relative to what is called the "historical average loss year." The program has not been capitalized, but generates surplus during less-than-average-loss years and has borrowing authority with the U.S. Treasury to cover losses in the event that policyholder funds and investment income are inadequate. The underwriting experience period has, to date, included a few relatively heavy-loss years, the most notable being 1979, 1983, 1989, 1992, 1993, and 1995. Despite these heavy-loss years, the absence of extremely rare but very catastrophic loss years leads to the conclusion that the historical average is less than what can be expected over the long term. The establishment of this target level of premium income for the program as a whole accommodates the combined effect of the portion of NFIP business paying less-than-full-risk premiums (a subsidy provided by statute) and the portion of the business paying full-risk premiums that do contemplate in their rates the full range of loss potential including catastrophic levels. The distribution of business written in 2002 is anticipated to be 29% at subsidized rates[1] and 71% at full-risk premium rates. FIMA estimates that, were the catastrophic contingency contemplated in establishing all rate levels, the Pre-FIRM[2] subsidized portion of the business would have to pay about two and a half times the current premium and the overall target level for premiums would have to increase on the order of 50% to 100%.

The most recent changes were effected on May 1, 2001. These resulted in an average rate increase of 3.2% for actuarially rated policies and 2.7% for subsidized policies, with the average program-wide rate increase being 3.0%. There were minor rate increases for most zones, with larger increases for standard policies in B, C, and X Zones (with corresponding increases in AR Zone rates), all V-Zones (Pre-FIRM and both Pre-'81 and Post-'81 Post-FIRM construction), the unnumbered A Zone, and the A99 Zone. These rate increases also incorporated a revised relativity between rates charged for "with enclosure" versus "with basement" structures. There was a rate increase in the Mortgage Portfolio Protection Program.

This year's *Actuarial Rate Review* recommends that the actuarial based rates increase 2.9% and the subsidized rates increase 2.3%, corresponding to an overall premium increase of 2.6%. A breakdown of the proposed rate increases by category is shown in Exhibit A. Once again, we are not changing the rates on Preferred Risk Policies (PRPs) due to successful underwriting changes implemented on these policies over the last few

[1] This estimate of 29% is composed of 26% Pre-FIRM and 3% other categories. For a more complete discussion of the various subsidized rates categories, see the "Ratemaking" section on pages 5-7.

[2] A "FIRM" is a Flood Insurance Rate Map, an official map of a community on which FIMA has delineated both the Special Flood Hazard Areas (SFHAs) and the risk premium zones applicable to the community. "Pre-FIRM" pertains to a building for which construction or substantial improvement occurred on or before December 31, 1974, or before the effective date of an initial FIRM.

years. In addition, the Mortgage Portfolio Protection Program rates (not shown in Exhibit A) are proposed to increase substantially.

From 1987 through 1992, the Congress, rather than appropriating tax dollars for federal staff salaries and the costs of flood studies and floodplain management as had been done previously, instead transferred policyholder premiums to salary and expense accounts and the emergency management program accounts of the Federal Emergency Management Agency (FEMA). These expenses were not authorized to be included in the insurance premium charges. The current value of this transfer and the resulting loss of investment income and increased borrowing is effectively a reduction in loss reserves in the National Flood Insurance Fund of about $503 million. This has made the fund more vulnerable to the need for exercising the NFIP's statutory borrowing authority in order to cover losses arising out of a large flood event. In 1993, the NFIP had to exercise its borrowing authority after experiencing a series of flood events over a 1-year period totaling over $1 billion in losses. The program used $11 million of borrowed funds in December 1993. These funds were repaid from policyholder premiums in 1994. The years 1995 and 1996 together produced losses at twice the level of the historical average, representing more than $2 billion over the 2-year period. As a result, the program continued to borrow funds, reaching $917 million in outstanding borrowing as of September 1997. Since then, the level of borrowing has reached a high of $922 million. As of June 2001, the program's outstanding debt had been repaid. However, since then, the program has again borrowed funds—totaling $600 million as of September 2001—in order to pay claims from Tropical Storm Allison (estimated to be the first $1 billion storm in the history of the NFIP), which struck in June 2001. Legislation was passed in September 1996 providing a 1-year increase in borrowing authority from $1 billion to $1.5 billion in order to provide a greater cushion against the potential losses in that year's hurricane season and beyond. This additional borrowing authority has been extended through FY2002.

The program's financial status must be addressed in a context that is broader than the focus of this rate review. While low loss experience can provide opportunities to rebuild surplus from policyholder premiums, other measures and public policy issues must also be explored. For example, FEMA has developed a strategy for addressing repetitive loss properties, prioritizing them, and seeking ways to increase mitigation assistance and reduce the extremely large levels of subsidy provided to such high-risk, older properties. Implementation of this strategy began in 1999 with the start of a new Special Direct Facility to handle the policies on these high-risk, repetitive loss properties. The degree to which funds are available to mitigate repetitive loss properties has a strong bearing on the acceptability of premium and coverage changes for such properties. In addition, a technical study, directed by the 1994 NFIP Reform Act, to examine the economic effects of eliminating the subsidy was released by FEMA during FY2000. FIMA drafted a multiyear plan to substantially reduce the subsidy and had completed a first round of vetting that plan with other agencies, Congressional staff, and other NFIP stakeholders when, in early 2001, the Presidential FY2002 Budget proposal was released containing specific subsidy reduction proposals. Congress has not implemented those proposals for FY2002, and FIMA continues to refine measures that would reduce the NFIP's level of subsidy.

Other public policy objectives must also be accommodated by the NFIP and have a bearing on the program's financial status. The current flood insurance marketing campaign, added focus on enforcement of mandatory insurance purchase requirements, and the occurrence of recent notable flood events have combined to produce an increase in NFIP policyholders significantly greater than experienced historically. This program growth will increase the potential dollar amounts borrowed, even if those amounts may be smaller relative to overall premium volume. And, apart from the Pre-FIRM subsidy, it is public policy to encourage the purchase of flood insurance in areas that are known to be experiencing temporary conditions of heightened flood risk, although a 30-day waiting period reduces some of the effects of this adverse selection.

The possibility of borrowing funds would be present even if all NFIP policyholders paid full-risk premiums. Twenty-nine percent of policyholders paying significantly less than full-risk premiums impedes the ability to generate surplus or to repay borrowed funds, which depends on levels of annual losses that are highly variable. Funding of the program from policyholder income or potentially from other sources must be addressed in the context of the long-term governmental goals for the NFIP, including its substitution for disaster relief and its encouragement of floodplain management. Subsidized insurance for older construction, built to lower standards in regard to the flood risk and for which full-risk premiums could be unreasonably high, was the quid pro quo for local community adoption of ordinances controlling new construction in the floodplain. It is also a means by which owners of older construction can at least prefund part of their own disaster recovery. It is estimated that the NFIP's standards for new construction are now saving about $1 billion annually in flood damage avoided. Additionally, it should be recognized that in fiscal years 1986 through 2001, the NFIP paid out, from policyholder funding, about $9.4 billion in insurance claims, which otherwise would have greatly increased taxpayer-funded disaster relief.

The Federal Insurance and Mitigation Administration believes that most of the salary, study, and floodplain management costs delineated above in the discussion of fund transfers are federal in nature and benefit taxpayers as a whole through programs that reduce future flood losses and resultant federal expenditures. However, the Congress legislated, with the Budget Reconciliation Act of 1990, that the full funding of these expenses would be borne by flood insurance policyholders through a Federal Policy Fee. To keep this charge as low as possible, the legislation specifically states that the fee is not subject to agent commissions, company expense allowances, or state or local premium taxes. Therefore, although in this rate review the Federal Policy Fee is included in exhibits and analyses of rate level indications, for accounting and WYO company reporting purposes, the fee is not considered to be premium.

Ratemaking

Generally accepted actuarial principles require at a minimum that a rating system provide protection against the economic uncertainty associated with chance occurrences by exchanging the uncertainty for a predetermined price. This price for insuring the uncertain event must:

- Protect the insurance system's financial soundness;
- Be fair; and
- Permit economic incentives to operate and thus encourage widespread availability of coverage.

For the purpose of setting prices, the broad grouping of risks with similar risk characteristics is a fundamental precept of a financially sound and equitable system. Because each property at risk is different, a rating system that attempts to identify and reflect in prices every risk characteristic is usually unworkable and costly. The basic features that must be present in sound risk groupings in order to meet the above criteria are:

- The system should reflect cost and experience differences on the basis of relevant risk characteristics.
- The system should be applied objectively and consistently.
- The system should be practical, cost-effective, and responsive to change.
- The system should minimize antiselection.
- The system should be acceptable to the public.

Also, in the case of flood insurance authorized under Public Law 90-448 (National Flood Insurance Act), the system of insurance and pricing must further the purposes of the Act, which include, among other things, to "(1) encourage state and local governments to make appropriate land use adjustments to constrict the development of land that is exposed to flood damage caused by flood losses, and (2) guide the development of proposed further construction, where practicable [emphasis added], away from locations that are threatened by flood hazards." In order to give practical meaning to these objectives, the standard of a 1% annual chance of flood is now used by virtually all federal, state, and local agencies and participating communities in the administration of floodplain management programs. The risk of experiencing a flood of this magnitude or larger is one chance in four during a typical 30-year mortgage period. In terms of flood insurance, this standard yields reasonably priced insurance protection to the property owner.

The use of a lesser standard approximating pre-1969 building practices would expose future risks to a better than 50% chance of being flood damaged during a typical mortgage period and result in insurance rates three to four times those reflecting the "1% annual chance of flood" standard. It was just this consideration of unaffordable full-risk premium (actuarial) rates that prompted Congress to "grandfather" existing construction at subsidized rates.

The National Flood Insurance Act of 1968 separated the flood insurance ratemaking process into two distinct categories, namely, chargeable premium (subsidized) rates and estimated-risk premium (actuarial) rates.

Subsidized Rates

These are countrywide rates by broad occupancy type classifications, which produce a premium income less than the expense and loss payments incurred for the flood insurance policies issued on that basis. The funds needed to supplement the inadequate premium income are provided by the National Flood Insurance Fund.

Pre-FIRM Subsidized Rates

The FIMA Administrator has promulgated subsidized rates for use in two cases. The first case is for the Emergency Program (added to the NFIP in 1970). Subsidized rates are also used in the Regular Program on construction or substantial improvement started on or before either December 31, 1974[3], or the effective date of the initial Flood Insurance Rate Map (FIRM), whichever is later. Exhibit E details the relationship between the amount of subsidized premium to be collected and the amount of premium required to fund the historical average loss year. The Pre-FIRM properties that pay less than full-risk premium are estimated to pay between 35% and 40% of the full-risk premium needed to fund the long-term expectation for losses.

Special Post-FIRM Classes That Are Subsidized

There are three other cases where classes of business are being subsidized either statutorily or by agreement with Congressional oversight committees.

The first of these is the class of risks located in Zone A99 areas that are subject to the 1% annual chance flood but for which structural protection that will protect to that level is at least 50% completed. By statute, rates are charged as if that protection were already in place.

A second case, recently added by statute, is the class of risks located in Zone AR areas. These are areas for which structural measures have been decertified as no longer providing protection to the "1% annual chance of flood" standard. If the areas meet certain criteria pertaining to a scheduled restoration of protection levels, then rates for new and existing construction are capped at the Pre-FIRM subsidized level. In July 1998, the first AR Zones became effective. After careful consideration of several public policy issues, FIMA set the initial rates for AR Zones at levels equivalent to X Zone rates. Such rates are substantially lower than the cap allowed by statute.

The third case is the class of risks comprised of Post-FIRM construction in the V Zones built between 1975 and 1981. These buildings were built to NFIP standards that accounted for stillwater flood elevations but not the associated wave heights, which were not determinable

[3] This additional "grandfathering" was added to the NFIP in 1973.

by the engineering state-of-the-art of the time. In October 1981, the NFIP was able to make use of the latest engineering developments and began to require new construction to be built to more stringent standards and to charge rates that took into account the risks posed by the waves associated with the Base Flood[4]. Because the previously compliant construction would be subject to very high rates if held to the same new standards, discussions with Congressional oversight committee members led to the decision to "grandfather" the 1975-81 construction with less than the full-risk premium rates indicated by the latest knowledge of the risk.

Actuarial Rates

These rates are promulgated by the FIMA Administrator for use under the Regular Program (the phase of the National Flood Insurance Program that a community may enter after the initial publication of the FIRM). The actuarial rates are applied in the rating of Post-FIRM construction and second layer limits of insurance on all construction (e.g., in the case of 1- to 4-family residences, amounts of insurance in excess of $35,000).

Actuarial rates are based on consideration of the risk involved and accepted actuarial principles. An overview of the actuarial rate calculations utilized in developing the indicated rates can be found in the Appendix. The formula described there follows in principle the "hydrologic method of estimating flood damage risk" outlined in the 1966 U.S. Department of Housing and Urban Development (HUD) report *Insurance and Other Programs for Financial Assistance to Flood Victims* (see page 50 of the report).

There are a few risk zones (Zones A, B, C, D, AO, AH, X, and V) where costs to obtain the hydrologic and topographic information needed to develop flood magnitude and frequency relationships would be extremely high in relation to the floodplain management benefits. Average rates based on actuarial and engineering judgments and underwriting experience have been promulgated for these zones.

Overall Rate Level Indications

It is important to note that the 1966 HUD report described the "hydrologic method" of ratemaking as a method that "uses available data on the occurrence of floods and damage, but is considerably more sophisticated than merely averaging losses over a period of time." This method of ratemaking, when coupled with special financial arrangements to protect the insurance company pool members against the risk of severe underwriting losses[5], eventually led to the legal requirements for actuarial rates under the National Flood Insurance Act of 1968. This marriage of ratemaking and financial arrangement

[4] The Base Flood is the flood associated with the Base Flood Elevation (BFE). In other words, there is a 1% chance in any given year that a flood will occur that equals or exceeds the Base Flood.

[5] The chance still remained that another severe hurricane like Hurricane Betsy or Camille could have wiped out the private insurers' pledged capital.

with private sector insurers was a necessary outcome. While the actuarial formula is the only valid estimate of flood damage over a very long period of time, the annual provision for flood insurance losses and loss adjustment expenses cannot be accurately predicted with any high degree of certainty. In fact, the estimated amount of losses in any future 1-year period is so uncertain that it can be provided for only by having available large loss reserves and replenishing those reserves by accumulating funds during good years to offset the drain on the reserve during bad years. Since the chargeable rates for so many policyholders are less than the actuarial rates by statute[6], the ability to accumulate loss reserves during the good years is impeded. However, the achievement of the goal of collecting sufficient premium to at least cover the historical average loss year now allows for some accumulation of reserves during years with loss volume less than the historical average. In view of the catastrophic loss potential, the current statutory method of providing borrowing authority to finance the long-term loss and loss adjustment provision of the flood insurance program makes a good deal of sense. Even though the federal government became the sole insurer in 1978, the funding mechanism has essentially remained the same. The NFIP experience over the 31 years clearly demonstrates the uncertainty in the average loss and loss adjustment cost per policy. The annual results are shown in the table below.

AVERAGE COST ($)					
Accident Year	**Untrended**	**Trended to 10/1/03**	**Accident Year**	**Untrended**	**Trended to 10/1/03**
1970	16.29		1986	64.60	102.69
1971	35.00		1987	53.09	81.09
1972	87.60		1988	25.55	38.59
1973	204.68		1989	311.96	441.46
1974	72.51		1990	74.63	102.30
1975	195.65		1991	148.76	201.32
1976	53.08		1992	289.34	384.11
1977	96.59		1993	254.39	322.95
1978	146.87	379.61	1994	148.82	185.63
1979	311.40	718.37	1995	416.12	499.12
1980	124.92	258.55	1996	243.30	284.60
1981	68.57	129.57	1997	142.22	162.51
1982	110.68	198.19	1998	224.61	252.28
1983	240.31	426.93	1999	186.82	203.16
1984	138.67	234.42	2000	57.92	61.08
1985	199.08	329.10			

In lieu of strictly establishing an overall rate level indication based on historical loss ratio data adjusted to current rate levels and adjusted for trends impacting on loss costs per policy, the rates for the different classifications are developed by the use of the mathematical models described in the Appendix, or by appropriate selection of rates based upon judgment

[6] By statute, all structures in the Special Flood Hazard Area (SFHA) that were built before December 31, 1974, or the effective date of the initial Flood Insurance Rate Map (FIRM), whichever is later, are to be charged less than actuarial rates. These policies are referred to as Pre-FIRM Subsidized.

and review of underwriting experience. FIMA also has employed mathematical and computer simulation approaches to define average annualized losses and the concurrent catastrophe loss requirements. With these analytical tools, criteria have been developed to measure the prospective underlying pure premium, to project the probabilities of various levels of borrowing needed to meet catastrophe losses for which pre-funded loss reserve has not been established, and to estimate capability to repay borrowed funds.

Target Level Premium Analysis

In 1981, the FIA (now FIMA) established the goal of becoming self-supporting for loss year levels at least equivalent to the historical average loss year. This was accomplished by 1988. Qualifying the target as the historical average as opposed to the long-term expected annual losses is an important distinction. Because, as of this point in time, the NFIP experience period (beginning with 1978) does not include any loss years that can be considered to be of catastrophic levels for the NFIP, the historical average is significantly less than that which can be expected over the long term where the influence of extremely large loss years would be felt. The importance of targeting the historical average should not be discounted, however. It is the level around which the great preponderance of loss years will concentrate and allows for the accumulation of reserves in years where losses are less than that level to help fund losses in years where they exceed that level.

The target level premium established by the historical average loss year allows FIMA to make a judgment during each rate review as to how well, according to the NFIP's definition, its self-supporting status is being maintained for the program overall. This "historical average loss year" approach to setting rates accommodates the statutory mandate that premium charges for Pre-FIRM risks, if less than full-risk premiums, must be reasonable. It provides a mathematical basis for determining rates for Pre-FIRM risks, which in the past were determined solely on a political basis, and provides an important framework for making accurate estimates of fiscal soundness. In following through on this approach, the premium charges for the two major categories of business, actuarial and Pre-FIRM subsidized, are developed very differently.

Actuarially rated policies are charged premiums that consider the probabilities of the full range of possible losses, including catastrophic levels. Thus, these premiums are targeted at the true long-term average. Written premiums for actuarial policies will generally be greater than those that would be based on the historical average loss year. This is consistent with the expectation that the long-term average annual losses will be higher than the historical experience to date because of the influence of relatively infrequent but catastrophic loss years.

Subsidized policies are defined as a category of business that does not make an adequate contribution to the loss reserve pool. These risks are charged premiums that are based on political and statutory considerations that override actuarial considerations. The probabilities of expected and/or catastrophic losses are not contemplated in the rates, which are established for Pre-FIRM construction as rate caps (limitations on chargeable rates) by

occupancy type and flood risk zone. FIMA estimates that the premiums for policyholders in this category are between 35% and 40% of what would be charged if the premiums were developed like those charged to the actuarial policies.

Use of the premium requirements indicated by the historical average loss year as a target level provides a means by which the NFIP can objectively assess its self-supporting status. Typically, during the rate review, it is first determined whether the actuarial rates need to be adjusted. The effects of any such adjustments on maintaining the overall target level are then projected. Adjustments to policy coverage or premiums for Pre-FIRM risks will likely be proposed to make up any overall shortfall so that, once again, the combination of actuarial and subsidized business can generate written premium at least to the level of the NFIP's self-supporting target. This methodology was particularly pertinent during the years leading up to achieving the self-supporting target and the first few years afterwards. It is important to note that the historical average is not a static target. If all aspects influencing NFIP experience remained constant but for the addition annually of another year to the experience period, the historical average could be expected to rise as it approaches the true long-term average. Other influences that have specific importance in projecting the target level are related to inflation and the expected types of policies to be written, particularly in regard to those paying full-risk premiums versus those that will be subsidized.

Even without any shortfall in the overall target level, proposals regarding Pre-FIRM subsidized rates and coverage may be made in order to gradually reduce the amount of subsidy. This has been an important consideration in more recent years, as the NFIP has moved toward maintaining written premium at a level somewhat above the level needed to fund the historical average loss year. The level of subsidy provided in the program has been the subject of much Congressional debate, and the NFIP reform legislation directed FEMA to study the economic effects of charging actuarially based premium rates for Pre-FIRM structures. PriceWaterhouseCoopers was contracted to conduct this study, and FEMA released the results during FY2000. FIMA drafted a multiyear plan to substantially reduce the subsidy and had completed a first round of vetting that plan with other agencies, Congressional staff, and other NFIP stakeholders when, in early 2001, the Presidential FY2002 Budget proposal was released containing specific subsidy reduction proposals. Congress has not implemented those proposals for FY2002, and FIMA continues to refine measures that would reduce the NFIP's level of subsidy.

Rate Review Results

Costs based on the 1978 through 2000 underwriting experience and expected NFIP activities were projected to the 2002-2003 cost levels. Exhibit E shows the premiums required by these projections, the expected average written premiums, and the relationship of the written premium to the historically indicated premiums for flood insurance coverage excluding the premiums for Increased Cost of Compliance coverage. The written premium based on all rate and rule changes through May 2002 is expected to be 122% of the level needed to fund the historical average loss year.

The rate and rule changes recommended for May 1, 2002, implementation include the following major points.

- An increase in the rates of standard policies in B, C, and X Zones, AR Zones, and A99 Zones of about 5%.
- An increase in rates for all V Zone categories, which include Pre-FIRM V Zones, Post-'81 Post-FIRM V Zones, and Pre-'81 Post-FIRM V Zones[7]. The increase in Pre-FIRM V Zones is about 6%, in Post-'81 Post-FIRM V Zones it is about 9%, and in Pre-'81 Post-FIRM V Zones it is also about 9%.
- An increase in the rates for Mortgage Portfolio Protection Program Policies of approximately 7%.

Exhibit A provides, by risk zone category, the average increases in premium projected as a result of the May 2002 rate and rule recommendations.

B, C, and X Zones Experience[8]

Both standard policies and PRPs in the X Zone had been subjects of scrutiny in the 1996 and 1997 *Actuarial Rate Review*s. Close examination of the PRP results led to the conclusion that the poor experience was due, in part, to heavy flood years occurring early in that product's experience period. In addition, the following two requirements necessary to write a PRP policy, implemented in 1998, have tightened the PRP underwriting rules:

- The insured property must be in an X Zone at the time of policy inception and at each subsequent renewal; hence, no "grandfathering" is allowed.
- The insured property cannot have experienced more than one flood loss exceeding $1,000 during its history, regardless of the current owner's flood loss experience.

Since then, PRP underwriting experience has shown improvement in both loss frequency and loss severity in absolute terms, and in relationship to the standard X Zone experience. Therefore, no premium increases are being recommended for PRP policies.

As in the past five rate reviews, it is again recommended that premiums for standard policies in B, C, and X Zones be targeted at a level that relates to the historical indicated premium level at least in the same way that actuarially rated AE Zone policies do. This would be about 140% of the historical indicated premium. Recommended rate increases

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[7] "Pre-'81 Post-FIRM V Zones" refers to the class of risks comprised of Post-FIRM construction in the V Zone built between 1975 and 1981. These buildings were built to NFIP standards that accounted for stillwater flood elevations but not the associated wave heights, which were not determinable by the engineering state-of-the-art of the time. In October 1981, the NFIP was able to make use of the latest engineering developments and began to require new construction to be built to more stringent standards.

[8] "B, C, and X Zones" is abbreviated to "X Zone" throughout this section and elsewhere in the document. As mentioned in the Appendix, since 1985 all new FIRMs have shown a reduced number of zones, with one of those being an X Zone. The X Zone encompasses areas formerly shown as Zones B or C.

for standard policies in B, C, and X Zones would result in an overall average increase of 5.2%, bringing premiums to about 138% of the historical indicated.

V Zone Experience

The increased risk of flooding brought about by erosion has been an area of concern for the NFIP. The 1994 NFIP reform legislation directed a study of a series of possible policy changes to address erosion hazards within federal programs. The Heinz Center for Science, Economics and the Environment was contracted to perform this analysis, and the study was released in June 2000. The study results demonstrated that the risk of flooding in those areas of V Zones that are susceptible to erosion will dramatically increase (a two- to three-fold increase in the risk in various areas of the country) during the next 30 to 60 years. The NFIP's ratemaking methodology for V Zones has not directly addressed this increased flood risk brought about by erosion. FEMA is currently investigating ways to do so in the flood maps and the flood rates. The Flood Insurance Rate Maps could be refined to delineate these erosion zones. However, that will depend upon funding, development of mapping standards, and political acceptance of higher premiums targeted at those subject to the increased flood risk due to erosion.

In May 2001, to partially address the hazard of erosion, the NFIP began a multiyear plan to increase rates for all V Zone policies. The second round of increases, included as part of the May 1, 2002, rate changes, varies between 6% and 9%.

Impact of Community Rating System

Policyholders in communities that participate in the Community Rating System (CRS) are eligible for discounts based on the creditable activities undertaken by those communities. The impact is considered in the target premium level projections and in their comparison with expected written premium.

The success of CRS—both in terms of number of communities and policyholders and in terms of activities undertaken and losses avoided—has continued to grow. Currently, nearly two-thirds of all NFIP policyholders are in participating CRS communities, with discounts ranging from 5% to 35%. On average, SFHA policyholders in participating CRS communities receive a premium reduction of 10.4%.

Mortgage Portfolio Protection Program

The Mortgage Portfolio Protection Program (MPPP) Policy serves as an additional tool to assist the mortgage lending and servicing industries in bringing their mortgage portfolios into compliance with the flood insurance requirements of the Flood Disaster Protection Act of 1973 and the NFIP Reform Act of 1994. It is intended that flood policies be written under the MPPP only as a last resort and only on mortgages whose mortgagors have failed to respond to the various notifications required by the MPPP.

The MPPP rates will increase about 7%. This increase will keep MPPP rates in reasonable proportion to the rates for business that is not force placed.

Expense Constant

Unlike the loss and loss adjustment costs, the acquisition costs and general expenses of the NFIP can be predicted with some degree of certainty and can be provided for in the annual insurance premium structure.

Exhibit D details the average charge per policyholder needed to fund certain expenses, assuming that these are all fixed costs per policyholder. About half of these expenses is funded through the Expense Constant, which is a fixed amount per policy contract. The other half is funded in a manner that increases the charge for contracts where more insurance is being purchased.

The Expense Constant is levied as a fixed amount per policy for all contracts other than the Residential Condominium Building Association Policy (RCBAP). This fixed amount also is loaded in the PRP premiums, even though the premium table does not separately identify it. The RCBAP is subject to a schedule that varies the Expense Constant by the number of units in the building.

Federal Policy Fee

As previously discussed, the expenses of flood insurance studies, floodplain management, and FEMA administrative costs are now charged to policyholders through a Federal Policy Fee (FPF). As with the Expense Constant, the RCBAP is subject to a schedule that varies the FPF by the number of units in the building. Preferred Risk Policies are charged an FPF of $5. Other non-RCBAP policy contracts are now charged an FPF of $30. Projecting recent historical trends into the next year, the FPF charges are anticipated to produce about $102 million income on a written basis in 2002-2003. Successful marketing efforts and increased lender compliance with mandatory purchase requirement provisions are continuing to have a positive impact on the NFIP's income from the FPF.

Exhibits

The following Exhibits include the information below.

A. Effects of Revisions on Written Premium

B. Insurance Underwriting Experience

C. Calendar/Accident Years 1978-2000 Experience for the Larger Risk Zones

D. Average Expenses per Policyholder

E. Projected Annual Premium Requirements Based on 1978-2000 Loss Experience vs. Projected Written Premium

Exhibit A

NATIONAL FLOOD INSURANCE PROGRAM

Effects of Rate Revision on Average Annual Written Premium (plus FPF)
per Policyholder*
Based on Projected Distribution of Business and
Projected Amounts of Insurance

	Distribution of Business	Average Annual Premium with May 2002 Rates	Increase over Annual Premium with Current Rates
REGULAR PROGRAM - ACTUARIAL RATES			
AE	29.5%	320.63	3.1%
A	1.7%	464.95	4.1%
AO,AH	0.6%	487.29	1.9%
AOB,AHB	8.1%	225.80	0.0%
ZONES AE,A,AO,AH,AOB,AHB	39.9%	309.91	2.6%
POST-81 V,VE	0.6%	1234.80	9.1%
B,C,X ACTUARIAL	30.6%	318.09	2.9%
(Standard)	12.7%	427.99	5.2%
(PRP)	17.8%	239.59	0.0%
SUB-TOTAL ACTUARIAL	71.1%	321.60	2.9%
REGULAR PROGRAM - SUBSIDIZED RATES			
PRE-FIRM SUBSIDIZED**	25.6%	655.39	2.0%
(Pre-FIRM V, VE)	1.0%	936.12	6.3%
75-81 POST V,VE	0.2%	781.44	8.8%
A99 PRE + POST	2.5%	467.50	5.3%
AR	0.6%	461.73	5.6%
EMERGENCY	0.0%	359.51	0.0%
SUB-TOTAL SUBSIDIZED	28.9%	637.01	2.3%
TOTAL	100.0%	414.08	2.6%

*Computations are based on counting and pricing units insured under Condo Master Policies separately.

**The category, PRE-FIRM SUBSIDIZED, includes Pre-FIRM V,VE which was broken out in order to show the premium increase for that subset of policies.

Exhibit A. Effects of Revisions on Written Premium

FEDERAL INSURANCE AND MITIGATION ADMINISTRATION — NATIONAL FLOOD INSURANCE PROGRAM — UNDERWRITING EXPERIENCE BY CALENDAR/ACCIDENT YEAR — EXHIBIT B1

Year	Earned Exposures (Millions)	Average Amount of Insurance per Policy	Earned Premium ($ Millions)	Loss & Loss Adjuster Expenses ($ Millions)	Average Premium	Average Operating Expense incl. Agts Comm.	Average Loss & LAE Cost per Policy	Operating Profit/ (Deficit) per Policy
2000	4.25	$126,322	$1,492.3	$246.4	$350.73	$129.62	$57.92	$163.19
1999	4.17	$119,569	$1,396.5	$779.1	$334.86	$126.25	$186.82	$21.79
1998	4.09	$115,639	$1,294.0	$917.8	$316.69	$115.52	$224.61	($23.44)
1997	3.80	$108,397	$1,054.9	$539.8	$277.90	$100.59	$142.22	$35.09
1996	3.52	$102,309	$904.9	$857.6	$256.73	$97.76	$243.30	($84.33)
1995	3.20	$99,023	$819.4	$1,331.3	$256.14	$100.48	$416.12	($260.45)
1994	2.85	$96,712	$734.6	$423.4	$258.20	$93.32	$148.82	$16.07
1993	2.67	$94,301	$667.9	$678.4	$250.45	$92.64	$254.39	($96.58)
1992	2.54	$90,400	$626.9	$734.6	$246.90	$91.83	$289.34	($134.26)
1991	2.47	$87,527	$602.2	$367.9	$243.48	$84.65	$148.76	$10.08
1990	2.33	$85,005	$570.4	$174.2	$244.40	$82.40	$74.63	$87.37
1989	2.17	$83,044	$531.3	$677.6	$244.59	$87.40	$311.96	($154.77)
1988	2.10	$80,350	$491.3	$53.5	$234.44	$73.56	$25.55	$135.33
1987	2.07	$76,700	$462.1	$110.2	$222.74	$70.14	$53.09	$99.50
1986	2.03	$71,110	$403.4	$131.5	$198.25	$63.53	$64.60	$70.12
1985	1.92	$66,888	$364.8	$382.4	$189.95	$55.49	$199.08	($64.63)
1984	1.92	$61,862	$334.9	$265.8	$174.68	$48.10	$138.67	($12.08)
1983	1.92	$58,105	$313.0	$460.8	$163.24	$42.06	$240.31	($119.14)
1982	1.89	$55,168	$247.7	$209.4	$130.90	$38.76	$110.68	($18.55)
1981	1.97	$50,883	$181.0	$134.9	$92.00	$31.60	$68.57	($8.17)
1980	1.95	$45,101	$149.2	$244.0	$76.38	$29.51	$124.92	($78.05)
1979	1.62	$37,650	$125.5	$505.8	$77.26	$23.80	$311.40	($257.94)
1978	1.06	$33,150	$81.8	$155.6	$77.20	$26.85	$146.87	($96.52)

Earned Premium does not include the Federal Policy Fee, nor are the expenses covered by that fee included in this exhibit.
Loss & Loss Adjuster Expenses includes an allowance for open claims.

Exhibit B1. Key Underwriting Components by Year, 1978-2000

FEDERAL INSURANCE AND MITIGATION ADMINISTRATION

NATIONAL FLOOD INSURANCE PROGRAM
UNDERWRITING EXPERIENCE BY CALENDAR/ACCIDENT YEAR

EXHIBIT B2
PAGE 1
Nov. 30, 2001

		1991	1992	1993	1994	1995
1)	Average Amount of Insurance per Policy	$87,527	$90,400	$94,301	$96,712	$99,023
2)	Earned Premium (A)	$602,221,598	$626,870,566	$667,887,326	$734,616,738	$819,448,282
3)	Losses Incurred (B)	$353,297,374	$709,375,157	$658,022,086	$410,630,987	$1,293,167,188
4)	Loss Adjustment Expenses	$14,637,573	$25,244,815	$20,374,665	$12,767,046	$38,092,591
5)	Loss&Loss Adjuster Ratio	0.611	1.172	1.016	0.576	1.625
6A)	Insurance Agent Commission--Direct	$15,694,184	$15,077,879	$14,699,645	$14,723,506	$14,361,100
6B)	Agent Commission Allowance--WYO	74,639,056	78,952,706	85,483,454	95,469,005	108,556,142
7A)	General Expense--Direct & WYO	$27,559,065	$29,889,329	$30,382,777	$30,423,366	$30,123,000
7B)	Operating Allowance--WYO	91,474,260	109,223,591	116,466,971	124,886,683	168,410,913
8)	Earned Exposure (C)	2,473,360	2,538,979	2,666,716	2,845,126	3,199,258
9)	Average Premium	$243.48	$246.90	$250.45	$258.20	$256.14
10)	Average Operating Other than Agent Commission & Loss Adjuster Expense (D)	$48.13	$54.79	$55.07	$54.59	$62.06
11)	Average Insurance Agents' Commission	$36.52	$37.03	$37.57	$38.73	$38.42
12)	Average Loss & Loss Adjuster Cost per Policy	$148.76	$289.34	$254.39	$148.82	$416.12
13)	Operating Profit/(Deficit) per Policy	$10.08	($134.26)	($96.58)	$16.07	($260.45)

(A) Does not include Federal Policy Fee, nor are the expenses covered by that fee reflected in this exhibit.

(B) Includes an allowance for open claims.

(C) This exhibit now counts exposures by policy and by each unit covered by a Residential Condominium Building Association Policy (RCBAP), which replaced CMP in 1994.

(D) Operating cost is funded on an ongoing basis (starting in 1981) by the collection of an expense constant from each policyholder.

SOURCE: Financial and Statistical Reports prepared by CSC, through its AIS.

Exhibit B2. Detailed Underwriting Experience by Year for the Latest 10 Years, Page 1

FEDERAL INSURANCE AND MITIGATION ADMINISTRATION

NATIONAL FLOOD INSURANCE PROGRAM
UNDERWRITING EXPERIENCE BY CALENDAR/ACCIDENT YEAR

EXHIBIT B2
PAGE 2
Nov. 30, 2001

	1996	1997	1998	1999	2000
1) Average Amount of Insurance per Policy	$102,309	$108,397	$115,639	$119,569	$126,322
2) Earned Premium (A)	$904,921,109	$1,054,882,114	$1,294,001,863	$1,396,458,515	$1,492,270,902
3) Losses Incurred (B)	$826,602,401	$517,813,327	$868,734,167	$741,436,213	$234,059,510
4) Loss Adjustment Expenses	$30,989,181	$22,029,533	$49,020,962	$37,646,199	$12,371,272
5) Loss&Loss Adjuster Ratio	0.948	0.512	0.709	0.558	0.165
6A) Insurance Agent Commission--Direct	$14,030,494	$14,703,373	$16,493,094	$16,165,323	$15,433,175
6B) Agent Commission Allowance--WYO	121,707,672	143,528,945	177,607,186	193,303,454	208,407,460
7A) General Expense--Direct & WYO	$42,312,000	$39,331,000	$46,326,000	$74,198,000	$75,472,000
7B) Operating Allowance--WYO	166,529,867	184,271,800	231,593,124	242,832,701	252,188,388
8) Earned Exposure (C)	3,524,840	3,795,920	4,086,074	4,170,322	4,254,768
9) Average Premium	$256.73	$277.90	$316.69	$334.86	$350.73
10) Average Operating Other than Agent Commission & Loss Adjuster Expense (D)	$59.25	$58.91	$68.02	$76.02	$77.01
11) Average Insurance Agents' Commission	$38.51	$41.68	$47.50	$50.23	$52.61
12) Average Loss & Loss Adjuster Cost per Policy	$243.30	$142.22	$224.61	$186.82	$57.92
13) Operating Profit/(Deficit) per Policy	($84.33)	$35.09	($23.44)	$21.79	$163.19

(A) Does not include Federal Policy Fee, nor are the expenses covered by that fee reflected in this exhibit.

(B) Includes an allowance for open claims.

(C) This exhibit now counts exposures by policy and by each unit covered by a Residential Condominium Building Association Policy which replaced CMP in 1994.

(D) Operating cost is funded on an ongoing basis (starting in 1981) by the collection of an expense constant from each policyholder.

SOURCE: Financial and Statistical Reports prepared by CSC, through its AIS.

Exhibit B2 (cont'd.). Detailed Underwriting Experience by Year for the Latest 10 Years, Page 2

FEDERAL INSURANCE AND MITIGATION ADMINISTRATION

NATIONAL FLOOD INSURANCE PROGRAM
LOSS AND EXPENSE EXHIBIT

EXHIBIT B3
Nov. 30, 2001

1969 - 1973 PART A VOLUNTARY PURCHASE
1974 - 1977 PART A MANDATORY PURCHASE REQUIREMENT
1978 - 1999 PART B MANDATORY PURCHASE REQUIREMENT

	1969-1973	1974-1977	1978-1985	1986-2000	1978-2000	1969-2000
FINANCIAL DATA						
1) Earned Exposure	416,885	2,517,054	14,252,024	44,266,806	58,518,830	61,452,769
2) Earned Premium	$25,048,538	$183,143,214	$1,797,881,733	$12,052,110,380	$13,849,992,113	$14,058,183,865
3) Losses Incurred	$53,575,994	$236,787,191	$2,249,157,917	$7,724,567,212	$9,973,725,129	$10,264,088,314
4) Loss Adjuster Expense	$4,654,789	$17,492,064	$109,638,796	$298,683,913	$408,322,709	$430,469,562
5) Insurance Agent Commission	$6,818,478	$37,999,048	$283,074,261	$1,807,816,557	$2,090,890,818	$2,135,708,344
6) Direct & Bureau General Expense and WYO Operating Allowance	$10,634,294	$64,436,942	$256,639,639	$2,556,234,230	$2,812,873,869	$2,887,945,105
ANALYSIS OF COSTS						
7) Average Premium per Policy	$60.09	$72.76	$126.15	$272.26	$236.68	$228.76
8) Average Loss & Loss Adjuster Cost per Exposure Unit	$139.68	$101.02	$165.51	$181.25	$177.41	$174.03
9) Average Insurance Agents Commission	$16.36	$15.10	$19.86	$40.84	$35.73	$34.75
10) Average Operating Costs Other Than Agent Commission & Loss Adj. Exp.	$25.51	$25.60	$18.01	$57.75	$48.07	$46.99
11) Operating Profit/(Deficit) per Policy	($121.46)	($68.96)	($77.23)	($7.57)	($24.54)	($27.01)
12) Loss Adjuster Expense as a Percentage of Loss	8.7%	7.4%	4.9%	3.9%	4.1%	4.2%
13) Agent Commission as a Percentage of Premium	27.2%	20.7%	15.7%	15.0%	15.1%	15.2%

Exhibit B3. Detailed Underwriting Experience Aggregated by Experience Period

Report: ARPCRPB3
Rundate: Mar 23, 2001

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
ACTUARIAL INFORMATION SYSTEM

Exhibit B4
Page 1

LOSS AND EXPENSE EXPERIENCE
Accident Period 1978 - 2000

	VE,V1-V30 Post-FIRM Post 10/81	Unnumbered A Zone Post-FIRM	AE,A1-A30 Post-FIRM & Pre-FIRM Actuarial	B,C,X Standard	B,C,X PRP	AO & AH Post-FIRM	AOB & AHB	Actuarial Totals
1) Earned exposures	237,654	985,030	13,663,045	13,358,539	3,167,842	142,332	2,359,313	33,913,756
2) Average Earned Premium	$749.73	$270.81	$181.61	$185.08	$196.20	$395.89	$163.03	$190.52
3) Number of Paid Losses	3,125	6,068	81,135	140,142	27,762	623	11,177	270,032
4) Average Loss Payment	$17,898.75	$13,756.39	$14,123.81	$13,385.05	$13,046.95	$15,081.57	$11,573.49	$13,561.77
5) Loss Ratio	0.31	0.31	0.46	0.76	0.58	0.17	0.34	0.57
6) Loss Frequency per 100 Policy Contracts	1.9	0.6	0.7	1.2	0.9	0.5	0.6	0.9
7) Average Loss Cost per Policy Holder	$235.36	$84.74	$83.87	$140.42	$114.34	$66.01	$54.83	$107.98
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO Operating Allowance	$72.55	$47.11	$42.37	$42.56	$57.81	$53.75	$41.39	$44.22
b) Agent Commission	$112.46	$40.62	$27.24	$27.76	$29.43	$59.38	$24.45	$28.58
c) Loss Adjuster	$9.25	$5.83	$3.47	$5.36	$5.80	$2.81	$2.86	$4.50
d) Total	$194.25	$93.56	$73.08	$75.68	$93.04	$115.95	$68.70	$77.29
9) Operating Surplus/(Deficit)* per Policyholder on Paid Basis	$320.12	$92.51	$24.65	($31.02)	($11.18)	$213.93	$39.50	$5.25
10) Total Operating Surplus/(Deficit)	$76,078,267	$91,121,043	$336,833,711	($414,357,070)	($35,420,190)	$30,448,641	$93,189,299	$177,893,701

* The operating surplus is the policyholder contribution in periods of relatively better loss experience towards reserves used to fund high loss years.

Exhibit B4. Detailed Underwriting Experience by Zone and by Actuarial vs. Subsidized, 1978-2000, Page 1

Report: ARPCRPB3
Rundate: Mar 23, 2001

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
ACTUARIAL INFORMATION SYSTEM

LOSS AND EXPENSE EXPERIENCE
Accident Period 1978 - 2000

	VE,V1-V30 Pre-FIRM	VE,V1-V30 Post-FIRM Pre 10/81	A Zone Pre-FIRM	AE,A1-A30 Pre-FIRM	AO & AH Pre-FIRM	Emergency Program	Subsidized Totals	Program Totals
1) Earned exposures	1,091,454	200,739	3,612,217	12,887,920	1,024,767	3,197,322	22,014,420	58,476,698
2) Average Earned Premium	$370.92	$327.21	$292.61	$336.60	$351.99	$111.91	$299.08	$236.68
3) Number of Paid Losses	24,142	3,059	67,470	287,142	5,557	104,657	492,027	794,372
4) Average Loss Payment	$16,569.82	$20,489.57	$12,949.02	$13,822.60	$11,869.88	$5,625.92	$12,113.52	$12,504.17
5) Loss Ratio	0.99	0.95	0.83	0.91	0.18	1.65	0.91	0.72
6) Loss Frequency per 100 Policy Contracts	2.5	2.2	1.9	2.4	0.5	3.3	2.3	1.5
7) Average Loss Cost per Policy Holder	$366.51	$312.23	$241.87	$307.97	$64.37	$184.15	$270.74	$169.86
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO Operating Allowance	$56.53	$53.77	$51.59	$54.37	$55.34	$40.20	$52.00	$48.07
b) Agent Commission	$55.64	$49.08	$43.89	$50.49	$52.80	$16.79	$44.86	$35.50
c) Loss Adjuster	$12.42	$10.79	$9.62	$11.88	$3.21	$10.43	$10.91	$6.95
d) Total	$124.59	$113.64	$105.11	$116.73	$111.34	$67.42	$107.77	$90.52
9) Operating Surplus/(Deficit)* per Policyholder on Paid Basis	($120.18)	($98.66)	($54.36)	($88.11)	$176.28	($139.67)	($79.44)	($23.70)
10) Total Operating Surplus/(Deficit)	($131,168,089)	($19,805,677)	($196,353,936)	($1,135,498,835)	$180,644,144	($446,558,191)	($1,748,740,584)	($1,386,119,003)

* The operating surplus is the policyholder contribution in periods of relatively better loss experience towards reserves used to fund high loss years.

Exhibit B4 (cont'd.). Detailed Underwriting Experience by Zone and by Actuarial vs. Subsidized, 1978-2000, Page 2

Report: ARPCRPB3
Rundate: Mar 23, 2001

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
ACTUARIAL INFORMATION SYSTEM

LOSS AND EXPENSE EXPERIENCE
Accident Period 1986 - 2000

	VE,V1-V30 Post-FIRM Post 10/81	Unnumbered A Zone Post-FIRM	AE,A1-A30 Post-FIRM & Pre-FIRM Actuarial	B,C,X Standard	B,C,X PRP	AO & AH Post-FIRM	AOB & AHB	Actuarial Totals
1) Earned exposures	230,369	826,227	12,077,061	9,246,923	3,167,842	136,105	2,320,876	28,005,404
2) Average Earned Premium	$751.99	$285.07	$192.34	$221.92	$196.20	$403.63	$163.79	$208.54
3) Number of Paid Losses	2,912	5,128	68,295	80,088	27,762	609	11,103	195,897
4) Average Loss Payment	$18,659.76	$14,728.59	$15,122.49	$17,733.85	$13,046.95	$15,175.34	$11,553.37	$15,736.09
5) Loss Ratio	0.31	0.32	0.44	0.69	0.58	0.17	0.34	0.53
6) Loss Frequency per 100 Policy Contracts	1.8	0.6	0.7	1.0	0.9	0.5	0.6	0.8
7) Average Loss Cost per Policy Holder	$235.87	$91.41	$85.52	$153.59	$114.34	$67.90	$55.27	$110.07
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO Operating Allowance	$90.54	$58.22	$51.80	$53.84	$57.81	$66.43	$49.82	$53.57
b) Agent Commission	$112.80	$42.76	$28.85	$33.29	$29.43	$60.55	$24.57	$31.28
c) Loss Adjuster	$9.14	$6.45	$3.52	$5.41	$5.80	$2.89	$2.89	$4.48
d) Total	$212.48	$107.42	$84.17	$92.55	$93.04	$129.86	$77.28	$89.33
9) Operating Surplus/(Deficit)* per Policyholder on Paid Basis	$303.64	$86.24	$22.65	($24.22)	($11.18)	$205.87	$31.24	$9.14
10) Total Operating Surplus/(Deficit)	$69,948,440	$71,250,901	$273,559,296	($223,976,846)	($35,420,190)	$28,019,871	$72,501,154	$255,882,626

* The operating surplus is the policyholder contribution in periods of relatively better loss experience towards reserves used to fund high loss years.

Exhibit B5. Detailed Underwriting Experience by Zone and by Actuarial vs. Subsidized, 1986-2000, Page 1

Report: ARPCRPB3
Rundate: Mar 23, 2001

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
ACTUARIAL INFORMATION SYSTEM

Exhibit B5
Page 2

LOSS AND EXPENSE EXPERIENCE
Accident Period 1986 - 2000

	VE,V1-V30 Pre-FIRM	Post-FIRM Pre 10/81	A Zone Pre-FIRM	AE,A1-A30 Pre-FIRM	AO & AH Pre-FIRM	Emergency Program	Subsidized Totals	Program Totals
1) Earned exposures	697,060	147,823	2,757,570	9,912,235	914,516	195,833	14,625,037	44,226,261
2) Average Earned Premium	$466.08	$352.49	$335.24	$390.46	$374.71	$205.23	$379.80	$272.26
3) Number of Paid Losses	14,908	2,017	47,063	197,177	4,671	3,919	269,755	478,718
4) Average Loss Payment	$21,440.56	$26,065.71	$14,862.35	$16,543.45	$12,678.57	$9,835.55	$16,427.62	$16,051.53
5) Loss Ratio	0.98	1.01	0.76	0.84	0.17	0.96	0.80	0.64
6) Loss Frequency per 100 Policy Contracts	2.6	2.3	1.7	2.1	0.5	2.0	2.0	1.2
7) Average Loss Cost per Policy Holder	$458.55	$355.66	$253.65	$329.09	$64.76	$196.83	$303.00	$173.75
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO Operating Allowance	$71.36	$63.38	$62.17	$66.05	$64.94	$53.04	$65.30	$57.75
b) Agent Commission	$69.91	$52.87	$50.29	$58.57	$56.21	$30.78	$56.97	$40.84
c) Loss Adjuster	$14.16	$11.31	$9.84	$12.24	$3.24	$8.02	$11.25	$6.71
d) Total	$155.43	$127.56	$122.30	$136.86	$124.39	$91.84	$133.52	$105.29
9) Operating Surplus/(Deficit)* per Policyholder on Paid Basis	($147.90)	($130.73)	($40.71)	($75.49)	$185.56	($83.44)	($56.72)	($6.78)
10) Total Operating Surplus/(Deficit)	($103,097,802)	($19,324,601)	($112,258,473)	($748,231,913)	$169,699,733	($16,341,227)	($829,554,284)	($299,841,084)

* The operating surplus is the policyholder contribution in periods of relatively better loss experience towards reserves used to fund high loss years.

Exhibit B5 (cont'd.). Detailed Underwriting Experience by Zone and by Actuarial vs. Subsidized, 1986-2000, Page 2

EXHIBIT C

REPORT: ARPPURE
RUNDATE: MAR 21 2001
RUNTIME: 12.11.58

FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
ACTUARIAL INFORMATION SYSTEM

ACCIDENT YEARS 1978 - 2000

FOR POLICY HOLDERS - CONSOLIDATED - EXCLUDE GF/MPPP
ICC DATA NOT INCLUDED

PROGRAM TYPE/ ZONE	EARNED EXPOSURE	EARNED PREMIUM	LOSSES PAID	ALLOCATED LOSS ADJ. EXPENSE	NO. OF PAID LOSSES	LOSS & LOSS ADJ EXP INC ON 05012003 COST LEVEL	PURE PREMIUM ON 05012003 COST LEVEL
POST-FIRM - SUBJECT TO ACTUARIAL RATE SCHEDULES							
AE,AO1-A30 + ELEV	6,251,573	975,171,832	416,544,005	18,243,700	30,010	542,143,805	86.72
AE,AO1-A30 O ELEV	1,887,478	494,422,631	155,952,571	5,848,478	9,463	203,199,923	107.66
AE,AO1-A30 - ELEV	347,039	180,039,836	71,770,035	3,324,682	5,061	93,485,352	269.38
AE,AO1-A30 SUBTOTAL	8,486,090	1,649,634,299	644,266,611	27,416,860	44,534	838,829,080	98.85
A	985,030	266,752,146	83,473,801	5,738,952	6,068	110,862,732	112.55
AO AND AH	142,332	56,348,304	9,395,816	400,652	623	11,704,877	82.24
AOB AND AHB	1,657,999	285,051,616	88,272,905	4,853,334	8,085	105,997,029	63.93
D	24,576	8,649,238	3,571,819	131,518	174	5,109,997	207.92
PRE-81 V + ELEV	150,705	44,581,115	49,435,344	1,697,142	2,435	69,904,175	463.85
PRE-81 V O ELEV	36,510	9,951,092	7,304,599	217,270	281	9,855,409	269.94
PRE-81 V - ELEV	12,285	10,727,116	5,826,109	242,939	324	8,412,172	684.75
PRE-81 V SUBTOTAL	199,500	65,259,323	62,566,052	2,157,351	3,040	88,171,756	441.96
PRE-81 V ZONES	1,240	425,161	111,539	7,998	19	195,403	157.59
POST-81 V + ELEV	179,443	112,847,270	45,302,183	1,708,714	2,491	57,854,866	322.41
POST-81 V O ELEV	27,084	29,113,421	5,306,102	214,123	275	7,148,518	263.94
POST-81 V - ELEV	30,125	35,493,460	5,259,986	269,530	350	7,038,728	233.65
POST-81 V SUBTOTAL	236,651	177,454,151	55,868,272	2,192,366	3,116	72,042,112	304.42
POST-81 V ZONES	1,003	722,529	65,329	4,904	9	110,849	110.51
B,C,X - STANDARD	3,347,597	736,845,118	386,673,832	13,087,570	19,080	502,454,049	150.09
B,C,X - PRP	1,394,377	286,108,909	113,022,947	5,479,210	7,897	134,777,910	96.66
ALL ZONES COMBINED	16,476,396	3,533,250,794	1,447,288,924	61,470,715	92,645	1,870,255,793	113.51
PRE-FIRM - ELECTING ACTUARIAL RATE SCHEDULES							
AE,AO1-A30 + ELEV	4,012,687	547,577,916	344,102,301	13,815,986	25,266	466,454,425	116.24
AE,AO1-A30 O ELEV	1,164,268	284,114,488	157,566,408	6,175,567	11,335	210,047,513	180.41
AE,AO1-A30 SUBTOTAL	5,176,955	831,692,404	501,668,709	19,991,554	36,601	676,501,938	130.68
B,C,X - STANDARD	10,010,942	1,735,571,792	1,489,134,282	58,504,593	121,062	2,238,567,905	223.61
B,C,X - PRP	1,773,465	335,419,606	249,186,448	12,895,413	19,865	300,256,358	169.30
AOB AND AHB	701,314	99,581,122	41,083,963	1,894,409	3,092	50,661,817	72.24
PRE AND POST FIRM COMBINED							
AE,AO1-A30 + ELEV	10,264,260	1,522,749,748	760,646,306	32,059,687	55,276	1,008,598,230	98.26
AE,AO1-A30 O ELEV	3,051,746	778,537,119	313,518,979	12,024,045	20,798	413,247,436	135.41
AE,AO1-A30 SUBTOTAL	13,316,006	2,301,286,867	1,074,165,285	44,083,732	76,074	1,421,845,666	106.78
B,C,X - STANDARD	13,358,539	2,472,416,910	1,875,808,114	71,592,163	140,142	2,741,021,954	205.19
B,C,X - PRP	3,167,842	621,528,515	362,209,395	18,374,624	27,762	435,034,267	137.33
PRE-FIRM - ELECTING SUBSIDIZED RATE SCHEDULES							
EMERGENCY	3,197,322	357,796,843	588,791,577	33,348,228	104,657	1,275,012,476	398.78
PRE-FIRM SUBSIDIZED	20,919,818	6,655,742,737	5,611,619,099	218,035,821	416,098	7,926,277,183	378.89
ALL SUBSIDIZED	24,117,140	7,013,539,580	6,200,410,676	251,384,048	520,755	9,201,289,660	381.52
GRAND TOTAL FOR ALL ZONES							
ALL ZONES COMBINED	58,518,832	13,616,947,412	9,937,346,245	406,472,743	794,609	14,348,706,679	245.20

Exhibit C. Calendar/Accident Years 1978-2000 Experience for the Larger Risk Zones

EXHIBIT D

Average Charge per Policyholder Needed
to Fund NFIP Servicing & Statistical Agent Contractors,
Administration of CRS, WYO Company Operating Allowance,
Marketing, and Miscellaneous Expenses

Number of Policyholders for Contracts Written during 2002/2003	4.50 million	
1) NFIP Servicing & Statistical Agent Contracts, CRS Administration, Marketing, Miscellaneous	$12.22	
Agent Commission on Above Premium	$2.16	
		$14.38
2) WYO Company Operating Allowance	$61.44	
Agent Commission on Above Premium	$10.84	
		$72.29
Total	$86.66	

Exhibit D. Average Expenses per Policyholder

EXHIBIT E

Average Annual Premium Required per Policyholder
for Historical Average Loss Year (w/o ICC)
vs.
Projected Premium Written with May 2002 Rates

Based on 2002/2003 Cost Levels

	Distribution of Business	Average Annual Premium Indicated by Historical Average Loss Levels and Projected Expenses	Projected Average Annual Written Premium* with May 2002 Rates (excluding ICC)	Projected Premium Expressed as Percentage of Historical Indicated Premium**
REGULAR PROGRAM - ACTUARIAL RATES				
AE ACTUARIAL	29.5%	221.31	316.63	143.1%
A ACTUARIAL	1.7%	230.76	459.66	199.2%
AO,AH ACTUARIAL	0.6%	197.37	482.05	244.2%
AOB,AHB	8.1%	184.30	221.36	120.1%
ZONES AE,A,AO,AH,AOB,AHB	39.9%	213.82	305.75	143.0%
POST-81 V,VE ACTUARIAL	0.6%	461.20	1224.09	265.4%
B,C,X ACTUARIAL	30.6%	296.72	312.76	105.4%
(Standard)	12.7%	307.49	423.73	137.8%
(PRP)	17.8%	289.03	233.59	80.8%
SUB-TOTAL ACTUARIAL	71.1%	251.64	316.80	125.9%
REGULAR PROGRAM - SUBSIDIZED RATES				
PRE-FIRM SUBSIDIZED***	25.6%	541.37	591.18	109.2%
(Pre-FIRM V, VE)	1.0%	625.92	871.91	139.3%
75-81 POST V,VE	0.2%	527.75	768.61	145.6%
A99 PRE + POST	2.5%	122.37	462.05	377.6%
AR	0.6%	95.05	461.73	485.8%
EMERGENCY	0.0%	616.98	359.51	58.3%
SUB-TOTAL SUBSIDIZED	28.9%	493.86	578.32	117.1%
TOTAL	100.0%	321.62	392.36	122.0%

*All computations are based on counting and pricing condominium units insured under Condo Master Policies separately. Projected Annual Written Premium has $50 Expense Constant and $30 Federal Policy Fee ($5 for PRP's) for individual policies, and prorates the schedule of charges for CMP's to the units covered. Historical Indicated Premium includes the equivalent of a $66.45 expense constant on all policy/units, a $26.68 Federal Policy Fee on all non-PRP policy/units, and a $5.00 Federal Policy Fee on PRP's.

** Based on 1978 - 2000 experience. Does not include consideration for development of catastrophic loss reserve. NFIP simulation modeling indicates that, because the 1978 - 2000 period does not include the large scale catastrophic year, the losses experienced in this time period will prove to be lower than the long-term average including catastrophic years.

***The category PRE-FIRM SUBSIDIZED includes Pre-FIRM V,VE which was broken out to show that subset of policies.

Exhibit E. Projected Annual Premium Requirements Based on 1978-2000 Loss Experience vs. Projected Written Premium

APPENDIX

Actuarial Rate Formula

Actuarial Rate Formula

Actuarial rates are applied in the rating of Post-FIRM construction and additional layer limits of insurance on all construction. This Appendix provides an overview of the actuarial rate formula that is utilized in developing these rates.

The actuarial rates are based on consideration of the risk involved and accepted actuarial principles. The actuarial rate formula may be expressed as follows:

$$RATE = \left[\sum_{i=Min}^{Max} \left(PELV_i \times DELV_i \right) \right] \times \frac{LADJ \times DED \times UINS}{EXLOSS}$$

Where: Min = minimum elevation relative to lowest floor at which flood damage occurs.

Max = elevation relative to lowest floor at which flood damage approaches a maximum.

The variable *PELV* is the probability of a particular water surface elevation relative to the 100-year Base Flood Elevation (BFE). For example, in Zone A10, the probability of water rising to or above an elevation 1 foot less than the 100-year flood elevation is 1.6%, and 1 foot above the 100-year flood elevation or higher is 0.6%, whereas the probability of water rising to or above BFE is 1%. There are many risk zones, and they are based on information gathered and calculations made by professional engineers and hydrologists. Various federal agencies, such as the U.S. Army Corps of Engineers, and private engineering firms are performing detailed risk zone and elevation studies of all serious flood-prone areas. The flood risk zones are determined from these detailed studies and *PELV* values are assigned to these zones. The results of these studies are published on a Flood Insurance Rate Map (FIRM) showing the zone and, where appropriate, the BFEs.

The assignment of *PELV* values must be accomplished in such a way as to keep the rating of policies as simple as possible and still distinguish expected average cost differences among the rate zones. There are 30 numbered A Zones for which different sets of *PELV* values may be assigned. However, there are three main technical reasons for combining risk zones for rating purposes[1]:

- Lowest Floor Elevations are measured to the nearest foot.
- Due to the difficulty in estimating the extremely rare flood, the base frequency curves are truncated at about the 350- to 500-year event.
- The BFEs are approximations based on the best available data about the major sources of flood.

[1] Some of the factors that increase flood hazard (e.g., local urban drainage problems and urbanization of other parts of the watershed) are virtually impossible to quantify if the Flood Insurance Study process is to remain cost effective.

As a practical approach, in 1982 five risk zone combinations were established reflecting 1.0 foot elevations, and a minimum elevation difference of 1.5 feet between the maximum flood level and the BFE was established for the risk zones that had the lowest flood hazard factors. Considering the relative variance in flood levels that can occur because of conditions that affect a particular building site during an actual flood, even more averaging for insurance rating is reasonable for buildings constructed with a Lowest Floor Elevation of –1.0 foot or above, relative to the BFE (the elevation of a flood with an exceedance probability of 1%). In 1983, the transition to a single rate schedule was approved. This approach has provided the NFIP with the means for simplifying FIRMs.

Since 1985, all new FIRMs have shown at most ten zones. These are A, AE, V, VE, AH, AO, AR, A99, X, and D. Zone AE includes all zones formerly designated as A1-A30, and Zone VE includes all those formerly designated as V1-V30. Zone X encompasses areas formerly shown as Zones B or C.

To assure consideration of the maximum flood level that might damage a building located in a Special Flood Hazard Area (even though elevated to the BFE or higher) and to recognize a minimum price associated with the risk transfer, the use of a minimum insurance rate has been continued. This is virtually mandated when adverse selection and the uncertainty of risk elevation are factors as important as they are in flood insurance. The minimum rate is $.16 per $100 of basic limits building coverage.

The need to establish minimum values also can be found in the manner that the Flood Insurance Study process treats hydrologic uncertainties. The accepted methods used in the studies tend to underestimate the calculated flood frequencies when there is little or no recorded flood data. Generally, recorded data relating to flooding events exceeding the 100-year event is sparse. The number of years of recorded flood data rarely exceeds a 30-year period. Even in those instances where longer records exist, changes in floodplain characteristics partly invalidate the usefulness of the data. It is generally accepted that the uncertainties involved in calculating the 500-year flood level are significant. Statistical analysis of these calculations has been published in the American Society of Engineers *Proceedings*. It has been projected that complete reliance on the traditional flood frequency tables in the calculation of insurance rates would produce only about one-half the insurance premium required to meet the insured risk.

The variable *DELV* is the ratio of the flood damage to the value of the insurable property and is obtained from depth percent damage tables. These tables are subject to experience checks by FIMA from a review of actual flood insurance claim files. The *DELV* values are calculated by weighting the actual insurance claims experience and the previously established depth percent damage values. The weighting is accomplished by using standard actuarial techniques (credibility).

The variable *LADJ* is the loss adjustment expense factor expressed as a percentage of losses (claim payments to policyholders). This provides funds for the payment of loss adjusters' fees and special claims investigation costs that are required to determine the appropriate insurance value of the flood damage and the amount due the policyholder under the terms

and conditions of the flood insurance policy. The value of *LADJ* is currently projected to be 4.2% under the adjuster fee schedule that was implemented on May 1, 1997.

The variable *DED* is the deductible offset. This variable is required to reflect the insurance policy condition that the first $500 of damage does not qualify for an indemnification payment. The factor *DED* is based on size of claim data produced from insurance claim files.

The variable *UINS* is the under-insurance factor and is included in the formula because flood insurance policyholders do not always insure to value. This requires that the impact of the *DELV* values in the formula be adjusted to account for the difference between property values and the amount of insurance purchased within basic and additional coverage limits for each category of risk. The value of *UINS* is determined by a review of insurance claims data.

The variable *EXLOSS* is the expected loss ratio and serves to load the actuarial rates for insurance agents' commissions and other acquisition expenses incurred in the selling of flood insurance policies and a small contingency loading. The contingency loading is 5% in nonvelocity zones and 10% in velocity zones.