

NATIONAL FLOOD INSURANCE PROGRAM

Actuarial Rate Review

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Purpose of This Document

An annual review of the National Flood Insurance Program (NFIP) underwriting experience, with accompanying Program revisions, is an integral part of maintaining the Program's goal of a fiscally sound rating and coverage structure. The purpose of this document is to share the results of the latest actuarial review of the rating structure in the context of the history and goals of the Program.

Overview

Floods have been, and continue to be, the nation's most destructive natural hazard in terms of economic loss. Over the past 35 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). As a result, the U.S. Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. The NFIP provides the means by which flood insurance is made available through the cooperative efforts of the Federal Government and the private insurance industry.

The NFIP is part of a coordinated, three-pronged approach developed to (i) identify those areas within local communities that are most at risk of flooding, (ii) minimize the economic impact of flooding events through a combination of mitigation efforts and floodplain ordinances, and (iii) make flood insurance available to help individuals and small businesses recover following a flood. The NFIP can provide the flexibility for flood insurance to be based on workable methods of pooling risks, minimizing costs, distributing burdens equitably among those protected by flood insurance and the general public, and structuring rates to support mitigation and floodplain ordinance efforts.

A Brief History of the NFIP

The National Flood Insurance Act of 1968 created the NFIP and its basic structure, which continues today. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages.

Participation in the NFIP is based on an agreement between communities and the Federal Government. Flood insurance is made available within a community when it adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains.

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.

In 1981, with the NFIP firmly established, 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. 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's intent is to generate premium at least sufficient to cover expenses and losses relative to what is called the "historical average loss year."¹

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. These measures were added in recognition of the fact that 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.

Financial Structure of the NFIP

Borrowing Authority

The Program has not been capitalized and pays losses and operating expenses out of policyholder premiums. The result is that during less-than-average-loss years the Program generates surplus, while during higher loss years that accumulated surplus is used to pay the amount by which insured flood losses exceed that year's net premium revenue. The NFIP has borrowing authority with the U.S. Treasury to cover losses in the event that policyholder

¹ This concept of targeting premium levels to the "historical average loss year" is explained in more detail in the section entitled "Premium Structure" on page 3.

funds and investment income are inadequate. Initially, the NFIP was granted a \$1 billion borrowing authority, but in 1996 legislation was passed (and subsequently extended) providing an increase in borrowing authority from \$1 billion to \$1.5 billion in order to provide a greater cushion against potential losses.

In 1993, the NFIP had to exercise its borrowing authority after experiencing a series of flood events over a 1-year period totaling more than \$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. The level of borrowing peaked at \$922 million during FY 1998, but was completely repaid by June 2001. Since then, the Program has borrowed \$650 million to pay claims from Tropical Storm Allison (June 2001)—the first \$1 billion storm in the history of the NFIP. This amount was repaid as of October 31, 2002.

Operating Expenses

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 \$519 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.

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 Write Your Own (WYO) company reporting purposes, the fee is not considered to be premium.

Premium 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's intent is to generate premium at least sufficient to cover expenses and losses relative to what is called

the “historical average loss year.” The underwriting experience period has, to date, included 7 heavy-loss years². 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 contemplate in their rates the full range of loss potential including catastrophic levels. The distribution of business written in 2003 is anticipated to be 28% at subsidized rates³ and 72% at full-risk premium rates. FIMA estimates that, were the catastrophic contingency contemplated in establishing all rate levels, the Pre-FIRM⁴ 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 75%.

The most recent changes were effected on May 1, 2002. These resulted in an average rate increase of 2.9% for actuarially rated policies and 2.3% for subsidized policies, with the average Program-wide rate increase being 2.6%. There were minor rate increases for most zones, with the largest increases (6% to 8%) falling on Pre- and Post-FIRM V-Zone properties, including V-Zone Mortgage Portfolio Protection Program (MPPP) policies.

This year’s *Actuarial Rate Review* recommends that the actuarial-based rates increase 3.6%, and the subsidized rates increase 1.9%, corresponding to an overall premium increase of 2.9%. A breakdown of the proposed rate increases by category is shown in Exhibit A. The largest of these increases are again in the Pre- and Post-FIRM V-Zones. In addition, four other changes are recommended. First, new higher optional deductible options are being recommended for nonresidential policies and Residential Condominium Building Association Policies (RCBAPs), and minor revisions are being made to the relativities for existing deductible options. Second, it is recommended that the Federal Policy Fee for Preferred Risk Policies (PRPs) be increased to \$10 from the current \$5. The third recommendation is to eliminate the Expense Constant in a revenue-neutral manner. This would be accomplished by raising the basic limits rates a sufficient amount to generate approximately the same amount of revenue that would otherwise have been generated by the Expense Constant. Fourth, it is recommended that the limit of liability under Increased Cost of Compliance (ICC) coverage be increased from \$20,000 to \$30,000.

² These 7 loss years are 1979 (Hurricane Frederic), 1983 (Hurricane Gloria), 1989 (Hurricane Hugo), 1992 (Hurricanes Andrew and Iniki), 1993 (the Great Mississippi Flood), 1995 (the May New Orleans Flood and a smaller Mississippi Flood), and 2001 (Tropical Storm Allison).

³ This estimate of 28% is composed of 25% Pre-FIRM and 3% other categories. For a more complete discussion of the various subsidized rates categories, see the “Ratemaking” section on pages 6-8.

⁴ 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.

Impact of Other Public Policy Objectives on the NFIP

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 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 FY 2000. 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. The Presidential FY 2002 Budget proposal contained specific subsidy-reduction proposals. The Presidential FY 2003 Budget proposal also contained a slightly refined version of subsidy reductions. Congress has not implemented those proposals for FY 2003, and FIMA continues to refine measures that would reduce the NFIP's level of subsidy.

Other public policy objectives that have a bearing on the program's financial status must be accommodated by the NFIP. 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. Even though the growth rate has slowed during the last 2 years, this larger policyholder base and its larger average amounts of insurance combine to 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-eight percent of policyholders paying significantly less than full-risk premiums impedes the NFIP's 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 prefund at least part of their disaster recovery. The NFIP's standards for new construction are now saving an estimated \$1.1 billion annually in flood damage avoided. Additionally, it should be

recognized that, in fiscal years 1986 through 2002, the NFIP paid out, from policyholder funding, about \$9.7 billion in insurance claims, which otherwise would have greatly increased taxpayer-funded disaster relief.

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 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 anti-selection.
- 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 30-year 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, 1974⁵, or the effective date of the initial 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, added by statute in 1998, 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. 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.

⁵ This additional “grandfathering” was added to the NFIP in 1973.

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 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 Flood⁶. 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*.

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

⁶ 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.

losses⁷, eventually led to the legal requirements for actuarial rates under the National Flood Insurance Act of 1968. This marriage of ratemaking and financial arrangement 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 statute⁸, the ability to accumulate loss reserves during the good years is impeded. However, the achievement of the goal of collecting sufficient premium to cover at least 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 years 1970 through 2001 clearly demonstrates the uncertainty in the average loss and loss adjustment cost per policy. The annual results are shown in the following table.

AVERAGE COST (\$)					
Accident Year	Untrended	Trended to 05/1/04	Accident Year	Untrended	Trended to 05/1/04
1970	16.29		1986	64.60	106.93
1971	35.00		1987	53.09	84.18
1972	87.60		1988	25.55	40.30
1973	204.68		1989	311.96	461.20
1974	72.51		1990	74.63	106.51
1975	195.65		1991	148.76	210.50
1976	53.08		1992	289.34	401.25
1977	96.59		1993	254.39	336.11
1978	146.87	395.13	1994	148.82	194.01
1979	311.40	748.16	1995	416.14	520.82
1980	124.92	269.16	1996	243.44	296.40
1981	68.57	134.62	1997	142.39	169.52
1982	110.68	206.18	1998	224.88	263.05
1983	240.31	445.69	1999	188.02	212.44
1984	138.67	243.37	2000	60.07	65.29
1985	199.08	342.46	2001	304.40	322.78

⁷ The chance still remained that another severe hurricane like Hurricane Betsy or Camille could have wiped out the private insurers' pledged capital.

⁸ By statute, all structures in the SFHA that were built before December 31, 1974, or the effective date of the initial FIRM, whichever is later, are to be charged less than actuarial rates. These policies are referred to as Pre-FIRM Subsidized.

In lieu of strictly establishing an overall rate level indication based on historical loss ratio data adjusted to current rate levels and further 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 and review of underwriting experience. FIMA 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 prefunded 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 NFIP experience since 1978 does not include any loss years of catastrophic levels for the Program, 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 the NFIP's self-supporting status is being maintained 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 actuarially rated 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 afterward. It is important to note that the historical average is not a static target. If all factors 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 FY 2000. 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. The Presidential FY 2002 Budget proposal contained specific subsidy reduction proposals. The Presidential FY 2003 Budget proposal also contained a slightly refined version of subsidy reductions. Congress has not implemented those proposals for FY 2003, and FIMA continues to refine measures that would reduce the NFIP's level of subsidy.

Rate Review Results

Costs based on the 1978 through 2001 underwriting experience and expected NFIP activities were projected to the 2003-2004 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 2003 is expected to be 120% of the level needed to fund the historical average loss year.

The rate and rule changes recommended for May 1, 2003, implementation would result in an overall premium increase of 2.9% and 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 3%.
- An increase in rates for V Zone categories as follows: Pre-FIRM V Zones, 5%; Post-'81 Post-FIRM V Zones, 9%; and Pre-'81 Post-FIRM V Zones⁹, 9%.
- New higher optional deductible options for nonresidential policies and RCBAPs, and minor revisions to the relativities for existing deductible options.
- An increase in the Federal Policy Fee for PRPs to \$10 from the current \$5, and slight increases in PRP premiums. The net result would be a 5% increase in the combined premium and Federal Policy Fee.
- The elimination of the Expense Constant in a revenue-neutral manner. This would be accomplished by raising the basic limits rates a sufficient amount to generate approximately the same amount of revenue that would have otherwise been generated by the Expense Constant.
- An increase in the limit of liability under Increased Cost of Compliance (ICC) coverage from \$20,000 to \$30,000.

Exhibit A provides, by risk zone category, the average increases in premium projected as a result of the May 2003 rate and rule recommendations.

Expense Constant

As part of the proposed changes for May 1, 2003, FIMA will eliminate the Expense Constant, a flat charge per policyholder that covers certain acquisition costs and general expenses of the NFIP. Most policyholders have been charged \$80 per annual policy term—a figure independent of the amount of insurance purchased—for the Expense Constant and the Federal Policy Fee. And, although the Expense Constant is premium, policyholders typically consider it a surcharge. To avoid this confusion, the Expense Constant will be eliminated in a revenue-neutral manner. This will be accomplished by increasing basic limits rates to generate approximately the same amount of revenue that the Expense Constant previously did.

⁹ “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.

Federal Policy Fee

The expense of flood insurance studies, floodplain management, and FEMA administrative costs is charged to policyholders through the Federal Policy Fee. Under the RCBAP, the fee varies according to the number of units in the building. Preferred Risk Policies will be charged a \$10 fee per policy, an increase from the current \$5. Other non-RCBAP policies are now charged a fee of \$30. On the basis of recent historical trends, the Federal Policy Fee is expected to produce about \$104 million income in 2003-2004.

Impact of Community Rating System

Policyholders in communities that participate in the NFIP's Community Rating System (CRS) are eligible for discounts based on the creditable activities undertaken by their 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%.

The elimination of the Expense Constant (with a corresponding increase in basic limits rates, so that the net effect will be revenue-neutral) will increase the value of CRS discounts to policyholders. This is because the CRS discount, which does not apply to the Expense Constant, will apply to the soon-to-be-increased basic limits premium. The elimination of the Expense Constant has been designed to be revenue-neutral including the impact of CRS discounts.

As a result of eliminating the Expense Constant and of CRS communities' improving their CRS classes by adopting additional creditable activities, SFHA policyholders in participating CRS communities should receive an average premium discount of 12.0% in 2003.

B, C, and X Zones Experience¹⁰

Both standard policies and PRPs in the X Zone had been subjects of scrutiny in the 1996 and 1997 *Actuarial Rate Reviews*. 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:

¹⁰ "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.

- 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’s flood history must meet additional requirements regarding paid insured losses and Federal Disaster Relief payments. The intent of these requirements is to screen out certain repetitively flooded properties from being eligible for the Preferred Risk Policy.

Up until Tropical Storm Allison, PRP underwriting experience had shown improvement in both loss frequency and loss severity in absolute terms, and in relationship to the standard X Zone experience. However, the losses on PRPs resulting from Tropical Storm Allison were disproportionately much higher than the losses on standard X Zone policies. Therefore, a premium increase is being recommended for PRPs in 2003, which, when combined with the increase in the Federal Policy Fee described above, will result in an average increase of 5.1%.

As in the past six rate reviews, it is recommended that premiums for standard policies in 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 for standard policies in X Zones would result in an overall average increase of 2.9%, bringing premiums to about 136% 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 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 third round of increases, which will be part of the May 1, 2003, rate changes, varies between 5% and 9%.

Deductibles

The current deductible factors have not been changed in many years. But, in general, inflation causes the average loss per claim to increase with time. So, as part of the May 1, 2003, rate changes, many of the deductible factors will be revised accordingly.

Currently, the highest available deductible on all policies is \$5,000. For RCBAP policies, deductibles up to \$25,000, effective May 1, 2003, will be offered. In addition, for other residential (non-RCBAP) policies and nonresidential policies, deductibles up to \$50,000, effective May 1, 2003, will be offered.

Increased Cost of Compliance (ICC) Coverage

The 1994 National Flood Insurance Reform Act (NFIRA) mandated a new coverage to compensate policyholders when they are required to bring their insured structures into compliance with local floodplain ordinances as a result of being substantially damaged by a flood. NFIRA required this new coverage to be actuarially sound, but placed a \$75 limit on what any policyholder could be charged. In compliance with these directives, FIMA introduced Increased Cost of Compliance (ICC) coverage in 1996 that provided up to \$15,000 of coverage. That amount was subsequently increased to \$20,000. A recent analysis of this coverage has led us to decrease our estimate of the claim frequency under this coverage, allowing us to further increase the ICC coverage limit to \$30,000.

Exhibits

The following Exhibits include the information below.

- A. Effects of Revisions on Written Premium
- B. Insurance Underwriting Experience
- C. Calendar/Accident Years 1978-2001 Experience for the Larger Risk Zones
- D. Average Expenses per Policyholder
- E. Projected Annual Premium Requirements Based on 1978-2001 Loss Experience vs. Projected Written Premium

Exhibit A

NATIONAL FLOOD INSURANCE PROGRAM
Effects of Rate Revision on Average Annual Written Premium (plus FPF) per Policyholder¹
 Based on Projected Distribution of Business and
 Projected Amounts of Insurance

	Distribution of Business	Average Annual Premium with May 2003 Rates	Increase over Annual Premium with Current Rates
REGULAR PROGRAM -- ACTUARIAL RATES			
AE	29.6%	\$334.05	3.6%
A	1.7%	\$501.99	1.8%
AO,AH	0.9%	\$428.79	0.2%
AOB,AHB	7.9%	\$228.21	0.0%
<u>AE,A,AO,AH,AOB,AHB</u>	<u>40.1%</u>	<u>\$322.33</u>	<u>2.9%</u>
Post-'81 V,VE	0.6%	\$1,497.78	9.0%
B,C,X Actuarial (Standard)	31.7%	\$328.86	4.0%
(PRP)	11.9%	\$444.09	2.9%
	19.8%	\$259.76	5.1%
<u>Subtotal Actuarial</u>	<u>72.4%</u>	<u>\$335.71</u>	<u>3.6%</u>
REGULAR PROGRAM -- SUBSIDIZED RATES			
Pre-FIRM Subsidized ²	24.6%	\$682.33	1.8%
(Pre-FIRM V, VE)	1.0%	\$1,044.09	4.9%
'75-'81 Post-FIRM V,VE	0.2%	\$845.76	9.2%
Post-FIRM A99	2.1%	\$489.43	2.8%
AR	0.6%	\$485.01	2.9%
EMERGENCY PROGRAM	0.0%	\$338.72	-5.7%
<u>Subtotal Subsidized</u>	<u>27.6%</u>	<u>\$663.91</u>	<u>1.9%</u>
<u>TOTAL</u>	<u>100.0%</u>	<u>\$426.33</u>	<u>2.9%</u>

¹Computations are based on counting and pricing units insured under Condominium Master Policies separately.

²The 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.

NFIP Actuarial Rate Review

November 30, 2002

FEDERAL INSURANCE AND
MITIGATION ADMINISTRATION

NATIONAL FLOOD INSURANCE PROGRAM
UNDERWRITING EXPERIENCE BY CALENDAR/ACCIDENT YEAR

EXHIBIT B1

<u>Year</u>	<u>Earned Exposures (Millions)</u>	<u>Average Amount of Insurance per Policy</u>	<u>Earned Premium¹ (\$ Millions)</u>	<u>Loss & Allocated Loss Adjustment Expenses² (\$ Millions)</u>	<u>Average Premium</u>	<u>Average Operating Expense incl. Agent Comm.</u>	<u>Average Loss & ALAE Cost per Policy²</u>	<u>Underwriting Profit/ (Deficit) per Policy</u>
2001	4.30	\$132,928	\$1,596.0	\$1,308.7	\$371.24	\$138.99	\$304.40	(\$72.15)
2000	4.25	\$126,322	\$1,495.3	\$255.2	\$351.90	\$130.06	\$60.07	\$161.77
1999	4.17	\$119,569	\$1,396.5	\$784.1	\$334.86	\$126.51	\$188.02	\$20.33
1998	4.09	\$115,639	\$1,294.0	\$918.9	\$316.69	\$115.61	\$224.88	(\$23.81)
1997	3.80	\$108,397	\$1,054.9	\$540.5	\$277.90	\$100.59	\$142.39	\$34.91
1996	3.52	\$102,309	\$904.9	\$858.1	\$256.73	\$97.75	\$243.44	(\$84.46)
1995	3.20	\$99,023	\$819.4	\$1,331.4	\$256.14	\$100.48	\$416.14	(\$260.48)
1994	2.85	\$96,712	\$734.6	\$423.4	\$258.20	\$93.32	\$148.82	\$16.06
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)

¹Earned Premium does not include the Federal Policy Fee, nor are the expenses covered by that fee included in this exhibit.

²Loss & Loss Adjuster Expenses includes an allowance for open claims.

Exhibit B1. Key Underwriting Components by Year, 1978-2001

FEDERAL INSURANCE AND
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NATIONAL FLOOD INSURANCE PROGRAM
UNDERWRITING EXPERIENCE BY CALENDAR/ACCIDENT YEAR

EXHIBIT B2
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	1992	1993	1994	1995	1996
1) Average Amount of Insurance per Policy	\$90,400	\$94,301	\$96,712	\$99,023	\$102,309
2) Earned Premium ¹	\$626,870,566	\$667,887,326	\$734,616,738	\$819,448,282	\$904,921,109
3) Losses Incurred ²	\$709,375,143	\$658,022,101	\$410,598,473	\$1,293,124,099	\$826,793,113
4) Allocated Loss Adjustment Expenses (ALAE) ²	\$25,244,815	\$20,374,666	\$12,824,584	\$38,227,167	\$31,279,015
5) Loss & ALAE Ratio	1.172	1.016	0.576	1.625	0.948
6A) Insurance Agent Commission--Direct	\$15,077,879	\$14,699,645	\$14,723,506	\$14,361,100	\$14,030,494
6B) Agent Commission Allowance--WYO	\$78,952,706	\$85,483,454	\$95,469,005	\$108,556,142	\$121,707,672
7A) General Expense--Direct & Bureau	\$29,889,329	\$30,382,777	\$30,423,366	\$30,123,000	\$42,312,000
7B) Operating Allowance (includes ULAE)--WYO	\$109,223,591	\$116,466,971	\$124,885,557	\$168,409,491	\$166,519,207
8) Earned Exposures ³	2,538,979	2,666,716	2,845,126	3,199,258	3,524,840
9) Average Premium	\$246.90	\$250.45	\$258.20	\$256.14	\$256.73
10) Average Operating Cost Other than Agent Commission & Loss Adjustment Expense ⁴	\$54.79	\$55.07	\$54.59	\$62.06	\$59.25
11) Average Insurance Agent Commission	\$37.03	\$37.57	\$38.73	\$38.42	\$38.51
12) Average Loss & Loss Adjuster Cost per Policy	\$289.34	\$254.39	\$148.82	\$416.14	\$243.44
13) Operating Profit/(Deficit) per Policy	(\$134.26)	(\$96.58)	\$16.06	(\$260.48)	(\$84.46)

¹Does not include Federal Policy Fee, nor are the expenses covered by that fee reflected in this exhibit. Also, Group Flood and MPPP premium is excluded.

²Includes an allowance for open claims. In addition, Group Flood and MPPP losses are excluded.

³This exhibit counts exposures by policy and by each unit covered by a Residential Condominium Building Association Policy (RCBAP), which replaced the Condominium Master Policy (CMP) in 1994.

⁴Operating cost is funded on an ongoing basis (starting in 1981) by the collection of a fixed amount (represented as an expense constant in the determination of premium formula) from each policyholder.

SOURCE: Financial and Statistical Reports prepared by CSC, through its Actuarial Information System.

FEDERAL INSURANCE AND
MITIGATION ADMINISTRATION

NATIONAL FLOOD INSURANCE PROGRAM
UNDERWRITING EXPERIENCE BY CALENDAR/ACCIDENT YEAR

EXHIBIT B2
PAGE 2
Nov. 30, 2002

	1997	1998	1999	2000	2001
1) Average Amount of Insurance per Policy	\$108,397	\$115,639	\$119,569	\$126,322	\$132,928
2) Earned Premium ¹	\$1,054,882,114	\$1,294,001,863	\$1,396,458,515	\$1,495,301,967	\$1,596,022,274
3) Losses Incurred ²	\$518,167,978	\$870,977,943	\$745,712,347	\$242,467,120	\$1,259,030,094
4) Allocated Loss Adjustment Expenses (ALAE) ²	\$22,344,745	\$47,914,018	\$38,385,349	\$12,776,795	\$49,645,497
5) Loss & ALAE Ratio	0.512	0.710	0.561	0.171	0.820
6A) Insurance Agent Commission--Direct	\$14,703,373	\$16,493,094	\$16,165,323	\$15,497,197	\$15,450,281
6B) Agent Commission Allowance--WYO	\$143,528,945	\$177,607,186	\$193,303,454	\$208,798,098	\$223,953,060
7A) General Expense--Direct & Bureau	\$39,331,000	\$46,326,000	\$74,198,000	\$75,472,000	\$59,575,000
7B) Operating Allowance (includes ULAE)--WYO	\$184,281,908	\$231,961,852	\$243,911,328	\$252,894,333	\$298,558,909
8) Earned Exposures ³	3,795,920	4,086,074	4,170,322	4,249,238	4,299,211
9) Average Premium	\$277.90	\$316.69	\$334.86	\$351.90	\$371.24
10) Average Operating Cost Other than Agent Commission & Loss Adjustment Expense ⁴	\$58.91	\$68.11	\$76.28	\$77.28	\$83.30
11) Average Insurance Agent Commission	\$41.68	\$47.50	\$50.23	\$52.78	\$55.69
12) Average Loss & Loss Adjuster Cost per Policy	\$142.39	\$224.88	\$188.02	\$60.07	\$304.40
13) Operating Profit/(Deficit) per Policy	\$34.91	(\$23.81)	\$20.33	\$161.77	(\$72.15)
====	=====	=====	=====	=====	=====

¹Does not include Federal Policy Fee, nor are the expenses covered by that fee reflected in this exhibit. Also, Group Flood and MPPP premium is excluded.

²Includes an allowance for open claims. In addition, Group Flood and MPPP losses are excluded.

³This exhibit counts exposures by policy and by each unit covered by a Residential Condominium Building Association Policy (RCBAP), which replaced the Condominium Master Policy (CMP) in 1994.

⁴Operating cost is funded on an ongoing basis (starting in 1981) by the collection of a fixed amount (represented as an expense constant in the determination of premium formula) from each policyholder.

SOURCE: Financial and Statistical Reports prepared by CSC, through its Actuarial Information System.

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1969 - 1973 PART A VOLUNTARY PURCHASE
1974 - 1977 PART A MANDATORY PURCHASE REQUIREMENT
1978 - 2001 PART B MANDATORY PURCHASE REQUIREMENT

	1969-1973	1974-1977	1978-1985	1986-2001	1978-2001	1969-2001
FINANCIAL DATA						
1) Earned Exposures	416,885	2,517,054	14,252,026	48,560,487	62,812,513	65,746,452
2) Earned Premium	\$25,048,538	\$183,143,214	\$1,797,881,733	\$13,651,163,719	\$15,449,045,452	\$15,657,237,204
3) Losses Incurred	\$53,575,994	\$236,787,191	\$2,249,157,887	\$8,998,994,604	\$11,248,152,491	\$11,538,515,676
4) Loss Adjustment Expense	\$4,654,789	\$17,492,064	\$109,638,797	\$349,164,297	\$458,803,094	\$480,949,947
5) Insurance Agent Commission	\$6,818,478	\$37,999,048	\$283,074,261	\$2,032,177,361	\$2,315,251,621	\$2,360,069,147
6) Direct & Bureau General Expense and WYO Operating Allowance	\$10,634,294	\$64,436,942	\$256,639,638	\$2,916,518,341	\$3,173,157,979	\$3,248,229,215
ANALYSIS OF COSTS						
7) Average Premium per Policy	\$60.09	\$72.76	\$126.15	\$281.12	\$245.95	\$238.15
8) Average Loss & Loss Adjuster Cost per Exposure Unit	\$139.68	\$101.02	\$165.51	\$192.51	\$186.38	\$182.82
9) Average Insurance Agent Commission	\$16.36	\$15.10	\$19.86	\$41.85	\$36.86	\$35.90
10) Average Operating Cost Other Than Agent Commission & Loss Adj. Exp.	\$25.51	\$25.60	\$18.01	\$60.06	\$50.52	\$49.41
11) Operating Profit/(Deficit) per Policy	(\$121.46)	(\$68.96)	(\$77.23)	(\$13.30)	(\$27.80)	(\$29.97)
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%	14.9%	15.0%	15.1%

Exhibit B3. Detailed Underwriting Experience Aggregated by Experience Period

FEDERAL EMERGENCY MANAGEMENT AGENCY
 NATIONAL FLOOD INSURANCE PROGRAM
 ACTUARIAL INFORMATION SYSTEM

LOSS AND EXPENSE EXPERIENCE
 Accident Period 1978 – 2001

	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	266,823	1,058,945	14,970,438	13,908,929	3,887,038	177,847	2,710,477	36,980,497
2) Average Earned Premium	\$777.04	\$279.60	\$188.72	\$191.14	\$203.15	\$392.07	\$166.58	\$197.35
3) Number of Paid Losses	3,168	6,681	87,972	147,279	39,861	767	11,997	297,725
4) Average Loss Payment	\$17,797.72	\$14,107.80	\$15,446.24	\$14,429.19	\$16,547.63	\$20,213.82	\$12,709.92	\$14,987.59
5) Loss Ratio	0.27	0.32	0.48	0.80	0.84	0.22	0.34	0.61
6) Loss Frequency per 100 Policy Contracts	1.7	0.7	0.7	1.2	1.0	0.5	0.6	0.9
7) Average Loss Cost per Policyholder	\$211.31	\$89.01	\$90.77	\$152.79	\$169.69	\$87.18	\$56.26	\$120.66
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO Operating Allowance	\$74.61	\$48.18	\$43.35	\$43.48	\$59.79	\$54.16	\$42.17	\$45.46
b) Agent Commission	\$116.56	\$41.94	\$28.31	\$28.67	\$30.47	\$58.81	\$24.99	\$29.60
c) Loss Adjuster	\$8.73	\$4.00	\$3.74	\$5.84	\$8.04	\$3.40	\$2.86	\$4.96
d) Total	\$199.90	\$94.12	\$75.40	\$77.99	\$98.30	\$116.36	\$70.02	\$80.02
9) Operating Surplus/(Deficit) ¹ per Policyholder on Paid Basis	\$365.83	\$96.48	\$22.56	(\$39.64)	(\$64.84)	\$188.53	\$40.31	(\$3.33)
10) Total Operating Surplus/(Deficit)	\$97,612,953	\$102,163,060	\$337,660,695	(\$551,361,607)	(\$252,044,970)	\$33,530,150	\$109,252,416	(\$123,187,303)

¹The operating surplus is the policyholder contribution in periods of relatively better loss experience toward reserves used to fund high-loss years.

FEDERAL EMERGENCY MANAGEMENT AGENCY
 NATIONAL FLOOD INSURANCE PROGRAM
 ACTUARIAL INFORMATION SYSTEM

LOSS AND EXPENSE EXPERIENCE
 Accident Period 1978 - 2001

	VE,V1-V30		A Zone Pre-FIRM	AE,A1-A30 Pre-FIRM	AO & AH Pre-FIRM	Emergency Program	Subsidized Totals	Program Totals
	Pre-FIRM	Post-FIRM Pre-10/81						
1) Earned Exposures	1,136,075	210,208	3,779,713	13,691,876	1,091,628	3,198,993	23,108,493	62,768,616
2) Average Earned Premium	\$386.57	\$337.84	\$302.64	\$350.70	\$362.91	\$112.01	\$312.02	\$245.95
3) Number of Paid Losses	24,507	3,081	70,337	298,451	5,846	104,699	506,921	837,088
4) Average Loss Payment	\$16,571.45	\$20,379.70	\$13,520.28	\$14,432.59	\$12,014.84	\$5,631.69	\$12,599.94	\$13,334.75
5) Loss Ratio	0.92	0.88	0.83	0.90	0.18	1.65	0.89	0.72
6) Loss Frequency per 100 Policy Contracts	2.5	2.1	1.9	2.3	0.5	3.3	2.3	1.5
7) Average Loss Cost per Policyholder	\$357.47	\$298.70	\$251.60	\$314.60	\$64.34	\$184.32	\$276.40	\$177.83
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO								
Operating Allowance	\$53.86	\$51.27	\$49.40	\$51.96	\$52.61	\$39.27	\$49.90	\$50.52
b) Agent Commission	\$57.99	\$50.68	\$45.40	\$52.60	\$54.44	\$16.80	\$46.80	\$36.89
c) Loss Adjuster	\$12.24	\$10.37	\$10.03	\$12.21	\$3.23	\$10.43	\$11.17	\$7.25
d) Total	\$124.09	\$112.32	\$104.83	\$116.78	\$110.27	\$66.51	\$107.88	\$94.66
9) Operating Surplus/(Deficit) ¹ per Policyholder on Paid Basis	(\$94.99)	(\$73.18)	(\$53.79)	(\$80.68)	\$188.30	(\$138.82)	(\$72.26)	(\$26.54)
10) Total Operating Surplus/(Deficit)	(\$107,915,689)	(\$15,383,341)	(\$203,325,926)	(\$1,104,592,171)	\$205,551,540	(\$444,074,437)	(\$1,669,740,024)	(\$1,666,100,887)

¹The operating surplus is the policyholder contribution in periods of relatively better loss experience toward reserves used to fund high-loss years.

FEDERAL EMERGENCY MANAGEMENT AGENCY
 NATIONAL FLOOD INSURANCE PROGRAM
 ACTUARIAL INFORMATION SYSTEM

LOSS AND EXPENSE EXPERIENCE
 Accident Period 1986 – 2001

	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	259,536	900,143	13,384,455	9,797,314	3,887,038	171,621	2,672,040	31,072,147
2) Average Earned Premium	\$779.82	\$294.25	\$199.25	\$228.44	\$203.15	\$398.07	\$167.30	\$214.90
3) Number of Paid Losses	2,955	5,741	75,132	87,225	39,861	753	11,923	223,590
4) Average Loss Payment	\$18,540.37	\$15,033.73	\$16,580.04	\$19,141.04	\$16,547.63	\$20,385.08	\$12,698.24	\$17,365.36
5) Loss Ratio	0.27	0.33	0.47	0.75	0.84	0.22	0.34	0.58
6) Loss Frequency per 100 Policy Contracts	1.7	0.7	0.7	1.1	1.0	0.5	0.6	0.9
7) Average Loss Cost per Policyholder	\$211.10	\$95.88	\$93.07	\$170.41	\$169.69	\$89.44	\$56.66	\$124.96
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO Operating Allowance	\$96.43	\$60.55	\$53.53	\$55.68	\$59.79	\$68.22	\$51.16	\$55.43
b) Agent Commission	\$116.97	\$44.14	\$29.89	\$34.27	\$30.47	\$59.71	\$25.09	\$32.23
c) Loss Adjuster	\$8.61	\$4.25	\$3.82	\$6.09	\$8.04	\$3.48	\$2.89	\$5.04
d) Total	\$222.01	\$108.93	\$87.24	\$96.04	\$98.30	\$131.41	\$79.14	\$92.70
9) Operating Surplus/(Deficit) ¹ per Policyholder on Paid Basis	\$346.71	\$89.44	\$18.94	(\$38.01)	(\$64.84)	\$177.22	\$31.49	(\$2.76)
10) Total Operating Surplus/(Deficit)	\$89,983,337	\$80,507,932	\$253,550,226	(\$372,400,440)	(\$252,044,970)	\$30,415,362	\$84,144,273	(\$85,844,282)

¹The operating surplus is the policyholder contribution in periods of relatively better loss experience toward reserves used to fund high-loss years.

FEDERAL EMERGENCY MANAGEMENT AGENCY
 NATIONAL FLOOD INSURANCE PROGRAM
 ACTUARIAL INFORMATION SYSTEM

LOSS AND EXPENSE EXPERIENCE
 Accident Period 1986 – 2001

	VE,V1-V30		A Zone Pre-FIRM	AE,A1-A30 Pre-FIRM	AO & AH Pre-FIRM	Emergency Program	Subsidized Totals	Program Totals
	Pre-FIRM	Post-FIRM Pre-10/81						
1) Earned Exposures	741,680	157,292	2,925,067	10,716,191	981,378	197,504	15,719,112	48,518,183
2) Average Earned Premium	\$484.33	\$365.17	\$345.75	\$404.44	\$385.31	\$206.15	\$393.21	\$281.12
3) Number of Paid Losses	15,273	2,039	49,930	208,486	4,960	3,961	284,649	521,434
4) Average Loss Payment	\$21,326.76	\$25,839.53	\$15,557.23	\$17,269.07	\$12,802.31	\$9,943.60	\$17,068.14	\$17,094.31
5) Loss Ratio	0.91	0.92	0.77	0.83	0.17	0.97	0.79	0.65
6) Loss Frequency per 100 Policy Contracts	2.6	2.2	1.7	2.1	0.5	2.0	1.9	1.2
7) Average Loss Cost per Policyholder	\$439.17	\$334.96	\$265.56	\$335.97	\$64.70	\$199.42	\$309.08	\$183.72
8) Other Expenses (Average per Policyholder)								
a) Servicing Facility/WYO Operating Allowance	\$74.59	\$65.79	\$64.35	\$68.69	\$67.27	\$54.04	\$67.86	\$60.06
b) Agent Commission	\$72.65	\$54.78	\$51.86	\$60.67	\$57.80	\$30.92	\$58.98	\$42.17
c) Loss Adjuster	\$13.78	\$10.71	\$10.36	\$12.64	\$3.26	\$8.12	\$11.61	\$7.12
d) Total	\$161.02	\$131.27	\$126.58	\$142.00	\$128.33	\$93.08	\$138.45	\$109.35
9) Operating Surplus/(Deficit) ¹ per Policyholder on Paid Basis	(\$115.86)	(\$101.07)	(\$46.38)	(\$73.53)	\$192.28	(\$86.35)	(\$54.32)	(\$11.95)
10) Total Operating Surplus/(Deficit)	(\$85,933,712)	(\$15,897,156)	(\$135,662,717)	(\$787,989,508)	\$188,695,281	(\$17,053,540)	(\$853,841,353)	(\$579,840,105)

¹The operating surplus is the policyholder contribution in periods of relatively better loss experience toward reserves used to fund high-loss years.

NATIONAL FLOOD INSURANCE PROGRAM
Analysis of Pure Premium per Policyholder
 Based on Claims and Policy Data for Accident Years 1978-2001
 Consolidated Data (excluding ICC)

EXHIBIT C

Program Type / Zone	(1) Earned Exposures (M)	(2) Earned Premium (\$M)	(3) Losses Paid (\$M)	(4) Allocated Loss Adjustment Expense (\$M)	(5) Number of Paid Losses	(6) Loss & Loss Adj. Exp. Incl'd. on 5/1/2004 Cost Level (\$M)	(7) Pure Premium on 5/1/2004 Cost Level (\$M)
Post-FIRM -- Subject to Actuarial Rate Schedules							
AE, A1-A30							
+ Elevated	6.89	1,111.1	479.4	20.8	32,120	637.9	92.58
0 Elevated	2.08	569.1	188.4	7.1	10,530	248.9	119.68
- Elevated	<u>0.41</u>	<u>212.4</u>	<u>87.8</u>	<u>4.1</u>	<u>5,577</u>	<u>115.9</u>	<u>284.78</u>
Subtotal	9.38	1,892.6	755.6	32.1	48,227	1,002.8	106.94
A	1.06	296.1	94.3	4.2	6,681	125.8	118.84
AO and AH	0.18	69.7	15.5	0.6	767	19.0	213.69
AOB and AHB	1.91	335.6	101.3	5.4	8,537	125.3	65.66
Post-'81 VE, V1-V30							
+ Elevated	0.20	130.3	45.7	1.8	2,521	61.2	305.08
0 Elevated	0.03	33.5	5.4	0.2	280	7.6	251.94
- Elevated	<u>0.04</u>	<u>42.8</u>	<u>5.3</u>	<u>0.3</u>	<u>358</u>	<u>7.4</u>	<u>211.91</u>
Subtotal	0.27	206.6	56.3	2.3	3,159	76.2	286.74
B, C, X							
Standard	3.57	811.6	450.6	15.5	20,791	597.3	167.26
Preferred Risk (PRP)	<u>1.75</u>	<u>372.7</u>	<u>213.5</u>	<u>9.8</u>	<u>11,909</u>	<u>252.2</u>	<u>143.96</u>
Subtotal	5.32	1,184.2	664.1	25.3	32,700	849.6	159.59
ALL ZONES COMBINED	18.14	3,995.2	1,690.9	72.4	100,261	2,204.4	121.53
Pre-FIRM -- Electing Actuarial Rate Schedules							
AOB and AHB	0.80	115.9	51.2	2.3	3,460	64.3	80.25
AE, A1-A30							
+ Elevated	4.33	609.9	403.1	16.1	27,216	554.2	127.99
0 Elevated	<u>1.26</u>	<u>322.8</u>	<u>200.1</u>	<u>7.8</u>	<u>12,529</u>	<u>267.2</u>	<u>211.48</u>
Subtotal	5.59	932.7	603.2	24.0	39,745	821.4	146.85
AE Non-Elevated	0.04	10.6	3.1	0.1	193	4.2	110.45
B, C, X							
Standard	10.34	1,846.9	1,674.5	65.7	126,488	2,551.3	246.80
Preferred Risk (PRP)	<u>2.13</u>	<u>417.0</u>	<u>446.1</u>	<u>21.5</u>	<u>27,952</u>	<u>532.7</u>	<u>249.52</u>
Subtotal	12.47	2,263.9	2,120.6	87.2	154,440	3,084.0	247.26
ALL ZONES COMBINED	18.91	3,312.5	2,775.0	113.5	197,645	3,969.7	209.97
Post-FIRM -- Electing Subsidized Rate Schedules							
A99	0.23	62.0	3.9	0.2	340	5.2	21.98
Pre-'81 VE, V1-V30							
+ Elevated	0.16	47.6	49.5	1.7	2,452	73.4	469.75
0 Elevated	0.04	10.8	7.3	0.2	284	10.4	268.07
- Elevated	<u>0.01</u>	<u>12.2</u>	<u>5.8</u>	<u>0.2</u>	<u>326</u>	<u>8.8</u>	<u>634.73</u>
Subtotal	0.21	70.6	62.7	2.2	3,062	92.7	443.40
Pre-'81 V	0.00	0.4	0.1	0.0	19	0.2	164.70
ALL ZONES COMBINED	0.45	136.3	66.7	2.4	3,421	98.0	216.25
Pre-FIRM -- Electing Subsidized Rate Schedules							
A	3.78	1,143.9	951.0	37.9	70,337	1,381.3	365.44
AE, A1-A30	13.69	4,801.7	4,307.4	167.2	298,451	6,185.8	451.79
All Other A Zones	3.17	844.0	278.5	13.3	30,509	459.3	145.00
V, VE	1.14	439.2	406.1	13.9	24,507	610.1	537.05
Other (Pre- & Post-FIRM)	0.33	87.1	97.0	3.7	7,254	146.9	440.15
Emergency	<u>3.20</u>	<u>358.7</u>	<u>590.3</u>	<u>33.4</u>	<u>104,715</u>	<u>1,337.5</u>	<u>417.68</u>
ALL ZONES COMBINED	25.31	7,674.6	6,630.3	269.4	535,773	10,121.0	399.86
TOTAL	66.31	16,049.7	11,538.5	474.6	874,863	16,999.2	256.36
Group Flood Ins. Policy (GFIP)	0.10	7.3	19.0	1.0	2,579	22.8	226.88
Mortgage Portfolio (MPPP)	<u>0.04</u>	<u>30.3</u>	<u>3.7</u>	<u>0.2</u>	<u>271</u>	<u>4.5</u>	<u>101.95</u>
GRAND TOTAL	66.46	16,087.3	11,561.2	475.8	877,713	17,026.5	256.21

Exhibit C. Calendar/Accident Years 1978-2001 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	\$63.14	
Agent Commission on Above Premium	\$11.14	\$74.28
Total		\$88.66

Exhibit D. Average Expenses per Policyholder

Average Annual Premium Required per Policyholder
for Historical Average Loss Year (w/o ICC)
vs.
Projected Premium Written with May 2003 Rates
Based on 2003/2004 Cost Levels

EXHIBIT E

Distribution of Business	Average Annual Premium Indicated by Historical Average Loss Levels and Projected Expenses	Projected Average Annual Written Premium ¹ with May 2003 Rates (excluding ICC)	Projected Premium Expressed as Percentage of Historical Indicated Premium ²	
REGULAR PROGRAM -- ACTUARIAL RATES				
AE Actuarial	29.6%	\$233.95	\$330.05	141.1%
A Actuarial	1.7%	\$241.54	\$496.69	205.6%
AO,AH Actuarial	0.9%	\$222.73	\$423.54	190.2%
AOB,AHB	7.9%	\$188.15	\$223.77	118.9%
<u>AE,A,AO,AH,AOB,AHB</u>	<u>40.1%</u>	<u>\$224.99</u>	<u>\$318.17</u>	<u>141.4%</u>
Post-'81 V,VE Actuarial	0.6%	\$436.65	\$1,487.07	340.6%
B,C,X Actuarial	31.7%	\$324.25	\$323.53	99.8%
(Standard)	11.9%	\$322.49	\$439.83	136.4%
(PRP)	19.8%	\$325.30	\$253.76	78.0%
<u>Subtotal Actuarial</u>	<u>72.4%</u>	<u>\$270.29</u>	<u>\$330.90</u>	<u>122.4%</u>
REGULAR PROGRAM -- SUBSIDIZED RATES				
Pre-FIRM Subsidized ³	24.6%	\$562.14	\$618.12	110.0%
(Pre-FIRM V, VE)	1.0%	\$636.51	\$979.88	153.9%
'75-'81 Post-FIRM V,VE	0.2%	\$503.91	\$832.92	165.3%
Pre- and Post-FIRM A99	2.1%	\$120.18	\$483.98	402.7%
AR	0.6%	\$93.79	\$480.75	512.6%
EMERGENCY PROGRAM	0.0%	\$615.50	\$338.72	55.0%
<u>Subtotal Subsidized</u>	<u>27.6%</u>	<u>\$515.44</u>	<u>\$606.00</u>	<u>117.6%</u>
TOTAL	100.0%	\$337.98	\$406.86	120.4%

¹All computations are based on counting and pricing condominium units insured under Condominium Master Policies (CMPs) separately. Projected Average Annual Written Premium has \$50 Expense Constant and \$30 Federal Policy Fee (\$10 for Preferred Risk Policies [PRPs]) for individual policies and prorates the schedule of charges for CMPs to the units covered. Historical Indicated Premium includes the equivalent of a \$51.32 Expense Constant on all policy/units, a \$26.53 Federal Policy Fee on all non-PRP policy/units, and a \$10.00 Federal Policy Fee on PRPs.

²Based on 1978-2001 experience. Does not include consideration for development of catastrophic-loss reserve. NFIP simulation modeling indicates that, because the 1978-2001 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.

³The 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 1978-2001 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:

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

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's rising to or above an elevation 1 foot less than the 100-year flood elevation is 1.6%, and 1 foot or more above the 100-year flood elevation is 0.6%, whereas the probability of water's rising to or above BFE is 1%. There are many risk zones, and they are based on information gathered and calculations made by 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 major 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 zones and, where appropriate, 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 purposes¹:

- 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 are 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.