



UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

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COMMUNITY AND ECONOMIC  
DEVELOPMENT DIVISION

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MAY 12, 1981

The Honorable Jake Garn  
The Honorable Howard M. Metzenbaum  
United States Senate



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Subject: Termination of the Map Information  
Facility Contract by the Federal  
Emergency Management Agency  
(CED-81-99)

Your August 20, 1980, letter requested that we obtain information on and analyze a number of issues related to the development of a map information facility (MIF) for the Federal Emergency Management Agency (FEMA) by the Chicago Aerial Survey. As you know, FEMA terminated the contract with the Chicago Aerial Survey on April 13, 1981. As arranged with your offices, we have summarized the following issues, some of which we believe affected FEMA's decision to terminate the contract.

- The increasing cost, reduced scope, and delays in developing the MIF.
- The accuracy of the flood zone determinations.
- The large number of inquiries having to be manually researched.
- The capability of the MIF to verify insurance premiums.

Many of the above issues could have been anticipated if FEMA had performed a feasibility study and cost benefit analysis before entering into the MIF development contract.

During the initial stages of our work, we met with various FEMA and Chicago Aerial Survey officials, reviewed various MIF-related documents and reports, and identified the major steps in automating communities on the MIF data base. Our work was conducted from September 1980 through January 1981 at FEMA offices in Washington, D.C., and at Chicago Aerial Survey offices in Des Plaines, Illinois, and Silver Spring, Maryland.

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In January 1981, as we were beginning the detailed part of our work, the Acting Administrator of FEMA's Federal Insurance Administration notified us that he was considering terminating the MIF contract. At that time we suspended further work until FEMA reached a decision on the contract. In April 1981, FEMA terminated the contract. We briefed your offices on the issues noted above and agreed to provide this report.

### BACKGROUND

The Congress enacted the National Flood Insurance Program in 1968 to provide flood insurance at reasonable rates. FEMA publishes flood hazard boundary maps which specifically delineate flood hazard areas in given communities. After these maps are published, the communities become eligible to join the emergency phase of the flood insurance program which provides limited amounts of insurance to property owners. Subsequently, FEMA performs a detailed study of the flood hazard areas and issues flood insurance rate maps that delineate the various degrees of flood hazard within each community. Once FEMA issues the rate map a community is eligible to join the regular phase of the program. Insurance agents use the hazard and rate maps to determine (1) whether properties are located in flood hazard areas and (2) insurance premiums.

The system described above is referred to as the map production/distribution system. FEMA operates the system by

- determining and surveying areas to be mapped and drafting the maps,
- having the maps printed,
- distributing copies of new maps,
- maintaining an inventory of current maps,
- making distributions when requested, and
- reordering maps when necessary.

### Map information facility

In January 1979, FEMA issued a request for a proposal to develop a map information facility which would, among other things, eliminate the need to distribute maps to lenders and insurance agents. The request noted that the map production/distribution system was not serving its intended purposes due to problems such as delays in distributing requested maps and the fact that some people have difficulty reading maps.

The request asked for a contractor to design, develop, operate, and maintain a data base and a storage, retrieval, and reporting system which would contain, for all participating communities, sufficient street address data and insurance rating information and eliminate the requirement to refer to maps. The contractor was to operate a MIF to answer phone and mail inquiries and provide information to lenders and insurance agents and brokers, eliminating their need for maps.

The Acting Administrator of FEMA's Federal Insurance Administration informed us that before issuing the request for a proposal, FEMA did not conduct a cost-benefit analysis to consider such key issues as

- the extent of the problems with the map production/distribution system,
- the cost and feasibility of improving the map production/distribution system, and
- the cost-benefits of alternative systems, including the MIF.

FEMA received and evaluated bids from 12 companies and awarded a cost plus fixed fee contract to the Chicago Aerial Survey of Des Plaines, Illinois. The contract awarded \$16,957,290 for a 3-year period beginning October 12, 1979. After developing an initial data base for communities in five States, the Chicago Aerial Survey began operation of the MIF in Silver Spring, Maryland, in April 1980. The MIF used a toll-free telephone service and a teletypewriter service to answer inquiries and provide insurance rating information to lenders and insurance agents and brokers. Operators handled inquiries by using the master address file. Inquiries that could not be handled automatically from the master address file were researched manually.

The contract provided that States would be phased into the MIF so that all communities in the program were to be served by the MIF by the end of the second year. Therefore, all program communities in all States were to be served by the MIF during the third year of the contract.

The master address file was developed from a process of overlaying Bureau of the Census files with the flood maps. The Census files (called GBF/DIME or geographic base file/dual independent mapping environment) are digitized local community maps with street addresses. Flood risk zones from the flood maps were imposed upon the Census files.

### GROWTH IN COST

The original contract cost estimate was \$16,957,290. As of December 31, 1980, actual project costs incurred by the Chicago Aerial Survey were \$8.339 million. A FEMA official said that the following MIF costs were not included in the above figure:

--Telephone and Western Union costs totaling \$163,364 for calendar year 1980.

--Bureau of the Census cost to provide data totaling \$25,000.

In October 1980 the Chicago Aerial Survey submitted a revised cost estimate for completing the MIF contract to FEMA. The revised cost estimate was for about \$19.5 million which included a projected cost growth of about \$1.87 million and contract modifications of about \$692,000. At that time, FEMA accepted most assumptions the Chicago Aerial Survey used to develop the revised cost. However, later FEMA assigned a different Government Technical Representative to the project, and in a February 10, 1981, memorandum he concluded that the Chicago Aerial Survey's assumptions were inaccurate. The memorandum further stated that the real cost to complete the project will be much higher than \$20 million. In a February 1981 meeting, FEMA's Acting Assistant Administrator for Insurance Operations told us that the project could cost up to \$30 million.

FEMA's Government Technical Representative told us FEMA never expected the MIF to cost less than the map production/distribution system. However, FEMA had expected to stop providing maps to lenders and insurance agents as States were included in the MIF. We were informed that the MIF would have eliminated the cost of reproducing and distributing maps to such individuals. However, FEMA's recently appointed Acting Administrator, Federal Insurance Administration, and two State officials believe that maps should continue to be available to lenders to further enhance the goals of the flood insurance program.

FEMA has continued to distribute maps in the States that were on the MIF; therefore, it appears the expected cost reductions were not achieved.

In later sections of this report we discuss other problems that affected the cost of the MIF.

### REDUCED SCOPE AND DELAYS IN DEVELOPING THE MIF

The MIF contract called for the availability of service to all communities already in the regular phase of the program

by the end of the first year and the availability of service for all emergency phase communities by the end of the second year. The contract required the development of a data base that included communities' street address data and all insurance rating information from current flood maps, as well as other requirements.

The contract stated:

"At a minimum the contractor shall construct this data base for: (1) all participating communities in Standard Metropolitan Statistical Areas; (2) for all communities with more than 1,000 policies in force as of June 30, 1979; (3) for all communities with a Government determined 'at risk' population, as of June 30, 1979, in excess of 5,000; (4) for such other communities as the GTR [Government Technical Representative] may reasonably direct; and (5) for such additional communities as to allow for a monthly average ninety eight (98) percent of all inquiries received to be answered by the MIF."

The contract did not specify the total number of communities the Chicago Aerial Survey would automate and enter into the MIF data base; however, FEMA's Director, Flood Insurance Operations, estimates that the contract provisions required about 8,000 communities to be entered into the data base.

In September 1980 FEMA and the Chicago Aerial Survey agreed to new criteria that limited the number of communities to be automated to about 2,000 communities (1,750 regular and 250 emergency). The new criteria required that only those communities with 100 or more policies in force would be automated. Chicago Aerial Survey estimated it would cost about \$2,000 to automate a regular community into the data base. We note that despite reducing the number of communities to be automated and placed in the MIF data base from about 8,000 to about 2,000, the revised contract cost estimate submitted by the Chicago Aerial Survey had increased. By increasing the number of communities to be excluded from the data base, more inquiries would require manual researches.

The new contract cost estimate was also based on an automated "hit" rate (determinations made by using the data base only) of 67.5 percent rather than the 98 percent in the original contract. We believe both changes would have increased the operating cost of the MIF by requiring more manual researches.

In February 1981, FEMA notified the contractor to stop any further development of the MIF data base. At that time--about 16 months into the 3-year contract--the development of

the data base was running substantially behind the required schedule in the contract.

In February 1981, regular communities in 17 States representing 28.6 percent of the regular program policies in force were being serviced by the MIF. According to FEMA, this percentage would have risen 4.6 percent to 33.2 percent if FEMA had agreed to allow Chicago Aerial Survey to begin servicing communities in 11 additional States on February 2, 1981. In addition, according to FEMA, the Chicago Aerial Survey had completed much of the work necessary to add communities in Florida to the MIF data base. Florida has approximately 30.5 percent of the regular program policies in force.

According to FEMA, as of February 1981, 144 communities in the 17 States were automated and available for MIF inquiries. In addition, 65 communities in 13 other States were automated and "ready to load" and another 48 communities were automated and ready for quality control testing. However, we note that at least 42 of the 257 communities are those with less than 100 policies in force and would not have been automated in the MIF data base under the new criteria. As a result, only about 215 communities or 10.8 percent of the total 2,000 communities were automated.

In the 17 States that were being serviced by the MIF over 100 communities with 100 or more policies in force still needed to be automated. According to FEMA, these communities had not been automated because they were either outside the Census files or the 1980 Census files were not available.

We believe that an important cost consideration would have been whether the per community cost to automate the remaining 1,785 communities (89.2 percent) would equate to the cost spent to automate the 215 communities. Chicago Aerial Survey had spent at least \$8.339 million through December 31, 1980, and had completed work for only about 10.8 percent of the communities. This indicates that the cost to complete work on the remaining communities may have led to total contract costs being substantially higher than the \$19.5 million estimated by the contractor.

#### ACCURACY OF FLOOD ZONE DETERMINATIONS

You had requested that we evaluate whether the process of integrating flood insurance maps into the MIF would result in accurate determinations of flood zones for particular properties. As agreed with your office, our work was terminated before we performed sufficient work to express an opinion on the accuracy question. We did, however, meet with contractor officials and observed the integration process. As described

to us, the process did require certain quality control and quality assurance steps to evaluate the data before its incorporation into the master address file.

FEMA had the Electronic Data Systems Federal Corporation test the accuracy of the MIF data base for communities that were automated using 1980 Census files, which were of better quality than 1970 Census files used in some communities. As noted by a FEMA official who reviewed the Corporation's audit report dated October 15, 1980:

"Unfortunately, the test was run only on those communities where 1980 GBF/DIME data was available. This was a biased and idealized test of the system, since it encompassed those areas where the best data was available. It represents the ultimate error rate which could be expected to be achieved by the automated system under ideal conditions. Of a total of approximately 20,000 street segments analyzed, an error of only 0.93 percent in flood zone determinations was identified. This is the most significant type of error."

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"These error rates are very low and are probably realistic where 1980 DIME data is available, especially since borderline determinations always revert to manual research. The use of 1970 DIME information will increase error rates, but probably not to significant proportions. Even if the above error rates were doubled or tripled, they could be considered quite low."

MANY INQUIRIES HAVE TO  
BE MANUALLY RESEARCHED

According to the contract, about 98 percent of the incoming calls for flood insurance determinations were to be handled automatically. However, Chicago Aerial Survey's \$19.5 million revised cost estimate is based on the assumption of a 67.5 percent automated hit rate.

The hit rate to date is substantially less. FEMA performed an analysis of the determinations made from April 24, 1980, through December 18, 1980, in 13 States and found that only 32.1 percent of incoming inquiries were handled automatically. We analyzed incoming inquiries for six of the same States from April 17, 1980, when the MIF began operations, through December 31, 1980, and found the automatic hit rate to be 32 percent.

FEMA also analyzed inquiries from communities with over 100 policies in force which were automated and found that the hit rate was only 44.3 percent. The 32.1 percent figure above includes all inquiries from automated and non-automated communities. FEMA concluded that automating the remaining communities with over 100 policies in force would not improve the hit rate.

According to the contractor's project director, the fact that the MIF was receiving only the more difficult determinations--those areas where zone changes occur and require that a determination be made manually--caused the low hit rate. He believed insurance agents were using existing flood maps for the easier determinations and relying on the MIF for the more difficult determinations.

CAPABILITY TO VERIFY  
INSURANCE PREMIUMS

According to FEMA officials, the MIF data base could be used to verify the hazard zone determinations and base flood elevations insurance agents assigned to properties on flood insurance applications. In the past, FEMA had no capability to verify such data and therefore was not sure that the premiums collected were correct.

FEMA recently conducted a study to determine the impact of validating flood insurance policy data with the MIF data base. In a preliminary report dated February 10, 1981, FEMA stated:

"The goals of this sample were to: (1) accurately count the number of agent errors with zones/BFE's [base flood elevations] and then calculate an error percent ratio, and (2) calculate over/under premium payments."

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"Over 1.3 million regular program policies are now on the NFIP [National Flood Insurance Program] policy master file that have never been verified with the MIF data base. The potential for agent error in providing the NFIP accurate zone and BFE information is considered to be great. Once a rating error reaches the policy master file, it stands an excellent chance of being perpetuated on each renewal occurrence."

The report concludes:

"The study projects that FIA [Federal Insurance Administration] has suffered, among all 50 states, over \$12.01 million in earned premium losses over the last three years through inaccurate risk zone and BFE information used in premium rating. Further, the study concludes that future losses will be substantially greater. During the next two years, the program will lose over \$12.66 million in earned premiums--unless intermediate steps are taken to utilize the MIF data base in the NFIP policy rating process."

As noted, FEMA's report was a preliminary one and further review by FEMA was still going on. If FEMA finds that it has sustained the losses indicated in the preliminary report, FEMA should determine if it can establish a cost-effective system for verifying hazard zone determinations and base flood elevations assigned to properties by insurance agents.

We did not review the results nor methodology of the study and cannot comment on its validity. However, at this time, there is no system to use the MIF data to verify insurance application data and establishing such a procedure or system would result in additional cost to FEMA.

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As requested by your offices, we did not obtain comments on this report from FEMA or the Chicago Aerial Survey.

As arranged with your offices, copies of this letter are also being sent to the Chairmen, House Committee on Banking, Finance, and Urban Affairs and Senate Committee on Banking, Housing, and Urban Affairs; the Chairmen of the Senate and House Committees on Appropriations; and the Director, Federal Emergency Management Agency. Copies will also be available to other interested parties who request them.



Henry Eschwege  
Director