Attachment 5

FUNDING FLASH FLOOD ALARM SYSTEMS

Currently NWS is purchasing the Flash Flood Alarm System (FFAS), performing the required site surveys, handling the installation and providing routine semi-annual maintenance inspections. The community provides for any required rights-of-way and pays for power and communications costs. Formal written agreements are signed by NWS and community officials. These practices are in compliance with an interim policy established by Dr. White during February 1972.

To date nine of these systems have been installed, and are working very well. The alarm's success is in a large part due to extensive testing, fail-safe design, careful site selection by flash flood hydrologists and installation by NWS electronic technicians. Approximately 34 additional systems are on order from FY73 funds and installation is scheduled during FY74.

We know that the sites where FFAS's can serve a useful purpose number in the thousands. The Office of Hydrology is analyzing lists of flood prone communities compiled by the Corps of Engineers, U.S. Geological Survey, Housing and Urban Development and other agencies, to determine the magnitude of the problem and to determine a rational priority system for the installation of FFAS's. This project (a review of office material) will be completed in early FY75 with the site surveys needed for a final listing.

Dr. White asked the NAS/NAE Committee Advisory to NOAA to study this problem as part of their in depth study of the flash flood problem. The matter was considered by the Committees Panel on Hydrology at its meeting in February 1973. Their recommendation was:

> The Panel believes that the NWS field personnel should suggest these devices to communities which can benefit from them, assist in selecting the site, and, if necessary, in making the installation. We suggest, however, that the community pay for the device and make arrangements for its necessary maintenance. Weather Service personnel should make periodic checks on the device to assure that it is receiving proper maintenance and that it will function if needed.
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> The devices are not so costly as to preclude local purchase except possibly in a few hardship cases. We believe that local responsibility for purchase and maintenance tends to ensure that the local people will view the device more seriously than if it were to be installed and maintained by the government.
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> Moreover, although the individual devices are not costly, installation of a large number would be costly in aggregate. For communities so poor that they are quite unable to bear the

cost, government installation would be indicated. However, even in the poorest communities, there is usually someone with the abilities required for routine maintenance.

It should be noted that the Committee was dissolved before the Panel's recommendations could be considered.

Meanwhile, the Defense Civil Preparedness Agency and the Federal Disaster Assistance Agency have become interested in purchasing FFAS's and making them available to states and/or communities. This possibility appears attractive on the surface. However, NWS would remain as the agency responsible for flood forecasts and warnings, and it is understood our expertise would still be required for selection of sites. Estimates of manpower required for these functions are attached. It is evident that equipment cost is only a small part of the resources needed for a continuing program.

Five solutions to the FFAS funding might be considered as follows:

1. Establish a federal policy to the effect that state and local governments buy, install, and maintain FFAS's. Those presently budgeted for by NWS, approximately 44, would be used for demonstration purposes by community preparedness specialists.

2. NWS fund for FFAS's at high priority sites (approximately 250) selected on a national priority basis and the remainder be handled by other.

* 3. NWS fund for FFAS's at high priority sites but make site selections only for other sites (according to established criteria) for FFAS's financed by federal agencies such as DCPA and FDAA having funding capability to work with state and local agencies.

4. NWS fund for FFAS's at high priority sites and perform both site selection and maintenance (according to established criteria) for FFAS's financed by other federal and/or state and local agencies.

5. Strive for an OMB decision that FFAS's fall within NWS total forecast and warning responsibility and that NWS assume lead agency role and receive appropriate resources.

A review of each alternative follows:

1. This approach would be in accord with the position of the present administration to encourage state and local responsibility for actions within their own capability. Present

NWS budgeted resources for FFAS's are relatively small; consequently, there is a real possibility that technical consultation services could not cope with a nationwide grass roots request for services. There is, however, the danger that many communities would opt for cheaper alarms, lacking fail-safe features, which could fail at critical times, thus placing lives and property in jeopardy to the discredit of NWS and local authorities as well. Reliance on a warning that fails to come can be devastating.

2. Under this proposal the NWS will have an FFAS activity that will provide a good base demonstration of a nationwide program. This option is similar to alternate one except the NWS effort would be increased (perhaps we would install as many as 5 systems per state) to serve those communities with potentially critical flash flood hazards that could best be served by the FFAS. This expanded NWS effort would provide greater national visibility to the program and thus acquaint a larger number of communities with this system. Hopefully, the danger of reliance on systems with inadequate fail-safe features by communities would be diminished. This option would not provide financial encouragement to those communities that would not be included in the NWS demonstration program and other federal agencies would operate on their own.

3. Community eligibility for site selection services would be determined by criteria to be established by the federal government. Site selection by individual inspections would require manpower slots along with funding by the sponsoring federal agency. NWS would require 18 positions for each one thousand sites for this reimbursable program. Presumably, site selections would be a one-time operation for a community and the manpower requirement would be related to the "popularity" of the program.

4. This option proposes that NWS assume responsibility for site selection and maintenance. This arrangement would increase substantially the NWS manpower requirement to be sure that equipment maintenance was adequate. Approximately 9 positions per 1000 sites would be required on a recurring basis. Travel for routine maintenance to sites that are widely dispersed would be expensive. This could be reduced substantially if monitored contract maintenance could be authorized. As in 3, NWS would require appropriate manpower slots for this reimbursable activity.

5. This option requires a commitment to sizable NOAA budget requests in the future. NWS places a higher priority on budget items for additional RFC's, extended RFC coverage, and other approaches to the flash flood warning problem than the FFAS. If it is assumed that DENR or DNR will come about in a reasonable time frame, there are important advantages in this approach. The USGS has many hydrologists and technicians working along the Nation's streams, and that agency may be interested in collaborating with NWS. The USGS also has established matching-fund programs with states and many local governments that would provide support for an NWS lead agency role.

NWS has a unique capability to provide the overall direction for a national program related to the Flash Flood Alarm System. However, its traditional role has been that of detection and prediction of natural disasters such as flash floods. Other federal agencies have been charged with responsibilities that relate to minimizing the personal and economic impact of such natural disasters on the individual and public institutions. Such agencies as the Defense Civil Preparedness Agency and the Federal Disaster Assistance Agency, although heavily oriented toward funding for disaster relief, are authorized to provide funding arrangements for facilities that would provide warnings and assist in developing a community's preparedness. This feature of their mission presents an early opportunity for nationwide implementation of FFAS's on a scale that NWS could not hope to undertake considering the overall priorities for funding within NOAA. Assuming that NWS is not likely to be designated as the Nation's sole agency for the complete range of flash flood warning activities, alternative 3 seems to provide the most workable arrangement for a national effort for the FFAS's.

Alternative 3 would provide for a strong base activity within NWS by enlarging its present program, which is currently only pilot type in size. This base program would give good state and regional visibility for this activity. An NWS program of this size (roughly 250 installations) would provide a convenient reference, or model installations, coping with regional variations in service requirements that could give confidence to local community officials as to the system's usefulness to meet their problems. Manpower and funding requirements would not upset normal budgeting procedures. Finally, the greatest number of FFAS's would be financed by local and federal matching fund arrangements. This arrangement calls upon local investment for services which have support of the present Administration. Financial and manpower ceiling support to NWS from the disaster relief organizations would provide for efficient utilization of resources that could not be realized by a single agency operation.

Alternative 3 calls for a number of federal positions (18 positions per 1,000 sites) and associated funding -- NOAA would need the support of OMB or sponsoring agencies for these positions.

Option 4 is the same as 3 except the additional assumption of maintenance by NWS for all sites. Since maintenance can be handled locally, option 3 would be a less costly arrangement and more efficient than having Federal employees carry out this task.

F L A S H F L O O D A L A R M S Y S T E M

CURRENT NWS ROLE

PROVIDE EQUIPMENT

SELECT SITE

INSTALL

MAINTAIN

CURRENT COMMUNITY ROLE

PROVIDE RIGHT OF WAY

POWER AND COMMUNICATIONS COSTS

PRE-DISASTER PLANS AND PREPARATIONS

ISSUANCE OF WARNINGS

COMMUNITY RESPONSE TO WARNING

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10 SYSTEMS HAVE BEEN INSTALLED

34 GAGES ARE NOW ON ORDER

F L A S H F L O O D A L A R M S Y S T E M

NEED TO RE-EXAMINE NWS-NOAA ROLE

BACKGROUND INFORMATION

A. ESTIMATED MORE THAN 20,000 FLOOD HAZARD AREAS IN U.S.

B. FFAS CONSIDERED USEFUL AT SEVERAL THOUSAND SITES
(INVESTIGATION UNDERWAY TO DETERMINE MORE EXACT NUMBER)

C. FEDERAL DISASTER RELIEF AGENCIES INTERESTED IN PROVIDING FINANCIAL SUPPORT

F L A S H F L O O D A L A R M S Y S T E M

OPTIONS

1. COMMUNITIES REQUIRED TO IMPLEMENT SYSTEM ON THEIR OWN

   (NWS COMPLETE CURRENTLY ASSIGNED PROGRAM -- APPROXIMATELY 44)

2. NWS FULLY RESPONSIBLE FOR HIGH PRIORITY SITES -- APPROXIMATELY 250

   OTHER COMMUNITIES ON THEIR OWN

3. NWS FULLY RESPONSIBLE FOR HIGH PRIORITY SITES WITH A

   REIMBURSABLE PROGRAM TO AID OTHER COMMUNITIES IN SITE SELECTION

4. NWS FULLY RESPONSIBLE FOR HIGH PRIORITY SITES WITH A

   REIMBURSABLE PROGRAM TO AID OTHER COMMUNITIES IN SITE SELECTION AND MAINTENANCE

5. NWS SEEK AUTHORITY AND RESOURCES TO DO THE ENTIRE JOB

F L A S H F L O O D A L A R M S Y S T E M

RESOURCE REQUIREMENTS

OPTION	ONE TIME $1,000	ONE TIME M-Y	RECURRING $1,000	RECURRING M-Y
1. 44 GAGES IN OR ON ORDER	132	0.8	9	0.4
2. 250 HIGH PRIORITY SITES	750	4.5	50	2.2
3. 250 HIGH PRIORITY SITES 1,000 OTHER SITES*	(750 (3,000	4.5 18.0	50 --	2.2 --
4. 250 HIGH PRIORITY SITES 1,000 OTHER SITES*	(750 (3,000	4.5 18.0	50 200	2.2 9.0
5. 5,000 SITES*	15,000	90.0	1,000	45.0

*COST OF DIFFERENT NUMBERS APPROXIMATELY PROPORTIONAL