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# REPORT TO THE CONGRESS

099379

UNITED STATES  
GENERAL ACCOUNTING OFFICE

BY THE COMPTROLLER GENERAL  
OF THE UNITED STATES

APR 13 1976

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## Need To Control Federal Warning System Proliferation

There are eight Federal agencies responsible for managing and operating Federal warning dissemination systems to alert the public of natural disasters and enemy attacks. Actions have been taken by the Interagency Warning Steering Group to coordinate efforts, but much remains to be done.

If unchecked, over \$182 million may be spent in fiscal years 1976 through 1980 to develop and operate five Federal warning systems. Some of these have overlapping requirements and coverage.

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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

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To the President of the Senate and the  
Speaker of the House of Representatives

*CWD 00001*

This report describes the warning systems operated by Federal agencies and the efforts made by the Interagency Warning Steering Group to coordinate warning efforts and to prevent system proliferation. It also describes the need to define and consolidate Federal warning dissemination requirements and to determine the most cost-effective systems arrangement to meet those requirements.

Our review was made pursuant to the Budget and Accounting Act of 1921 (31 U.S.C. 53) and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the President of the United States; the Directors of the Office of Telecommunications Policy and Office of Management and Budget; the Administrators of the General Services Administration and the National Aeronautics and Space Administration; the Secretaries of the Departments of Housing and Urban Development, Defense, Commerce, and Transportation; and the Chairman of the Federal Communications Commission.

*James A. Stacks*

Comptroller General  
of the United States

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ABBREVIATIONS

DIDS	Decision Information Distribution System
<i>ABC 00054</i> DCPA	Defense Civil Preparedness Agency
EBS	Emergency Broadcast System
<i>ABC 00071</i> FCC	Federal Communications Commission
<i>ABC 00036</i> GAO	General Accounting Office
<i>↓</i> NASA	National Aeronautics and Space Administration
NAWAS	National Warning System
<i>ABC 00068</i> NOAA	National Oceanic and Atmospheric Administration
<i>ABC 00060</i> TP	Office of Telecommunications Policy
<i>ABC 00074</i>	Dept. of Commerce

D I G E S T

- There are eight Federal agencies responsible for managing and operating Federal warning dissemination systems to alert the public of natural disasters and enemy attacks. (See pp. 1 and 2.) Representatives of these agencies compose the Interagency Warning Steering Group, chaired by an Office of Telecommunications Policy representative.
- Some progress has been made in coordinating agency efforts; however, much remains to be done. No single entity has sufficient authority to consolidate Federal warning programs and to prevent system proliferation. (See pp. 1, 18, and 27.)

*FIC* There are five general purpose warning systems existing or being planned. They may cost over \$182 million through fiscal year 1980. Seven specialized warning systems are being developed and operated which may cost over \$170 million through fiscal year 1980. (See pp. 2 to 6.)

- The Office of Telecommunications Policy has selected the Department of Commerce's Weather Radio System as the Federal home warning system. (See p. 19.) This system is being expanded and linked up with the Department of Defense's National Warning System. These two systems are estimated to cost \$42 million through fiscal year 1980. (See p. 7.)
- With planned or feasible improvements, the two linked systems could be made adequate for economical and effective dissemination of natural disaster and attack warnings to the public. (See p. 26.)

In contrast, three other general purpose warning systems which do not appear to be operationally or economically justified are estimated to exceed \$140 million through fiscal year 1980. (See p. 7.)

Only one of these three systems would be completed by 1980. None would <sup>not</sup> significantly increase Federal warning system effectiveness over the possible effectiveness through improvements to the two linked-up systems. (See pp. 7 and 26.)

✓ Radio and television announcements are expected to remain the primary means of warning the public. To be effective, however, each warning system must be linked up with a high percentage of radio and television stations. (See pp. 7 to 17 and 27.)

✓ The Federal Communications Commission <sup>(FCC)</sup> requires each radio and television station to provide equipment and facilities to receive messages from its Emergency Broadcast System, a specialized warning system. ✓ Radio and television stations are reluctant to assume the financial and operational burden of connecting to a large number of warning systems, in addition to the Emergency Broadcast System. (See p. 27.) However, the Departments of Commerce and Defense are working with the Federal Communications Commission to develop plans and procedures for using the Emergency Broadcast System to systematically provide warnings to broadcast stations. (See pp. 20 and 21.)

→ Most agencies involved agree with ~~GAO~~ that management actions are needed to control system proliferation. ✓ The two agencies responsible for the five general purpose warning systems appear to be concerned primarily with justifying continued development and operation of their own systems to meet their individual requirements and responsibilities. They believe that present coordination is effective. ✓ The Office of Management and Budget also believes that the Office of Telecommunications Policy's authority to plan and coordinate is sufficient. The Office of Telecommunications Policy agrees with GAO that there is no mechanism for any single entity to control Federal warning efforts. (See pp. 22 to 25.)

*Rec to Agency*  
GAO ~~recommends~~ *should* that the President take appropriate action, including seeking new legislation if necessary, to designate the Office of Telecommunications Policy as chairman of the Interagency Warning Steering Group to:

- (1) --Define and consolidate all Federal requirements for natural disaster and attack warnings to the public.
- (2) --Develop an integrated national program to meet those requirements in the most operationally effective and cost-effective manner.
- (3) --Prevent continued operation or further development, implementation, or expansion of warning systems unless justified for purposes other than warning. (See pp. 27 and 28.)

*Rec to Congress*

The Congress may want to consider funding constraints on certain natural disaster and attack warning systems, pending definition of the recommended integrated national program.

Terms:

*Broadcasting industry*  
~~*Communications operations*~~  
*Defense communications operations*  
*National defense operations*  
*Telecommunications operations*  
*Warning Systems*

*LIA -*





## CHAPTER 1

### INTRODUCTION

During our preliminary inquiries into the need for multiple warning systems, Congressman Clarence J. Brown requested we review actions and coordination efforts of the Federal agencies responsible for achieving an integrated Federal warning system that would alert the public of enemy attacks and natural disasters. He further requested a complete inventory of all Federal warning systems under development or in use through fiscal year 1976.

The Federal Civil Defense Act of 1950 included as a civil defense function the dissemination of warnings of enemy attacks to the public. The Government's warning responsibilities were expanded with the Disaster Relief Acts of 1970 and 1974. The 1970 act authorized the President to make available to appropriate Federal agencies the civil defense communications system for natural disaster warning purposes. The act of 1974 further provided that the President shall insure all appropriate Federal agencies be prepared to issue warnings of disasters to state and local officials.

### ADMINISTRATION OF FEDERAL WARNING SYSTEMS

Eight Federal agencies have a major responsibility for management or operation of Federal warning systems.

In 1970 the Office of Telecommunications Policy (OTP), previously under the Office of Emergency Preparedness as the Office of Telecommunications Management, was established as a separate Federal agency. It was assigned responsibility for coordinating telecommunications activities of the executive branch. One of its assigned general functions is to "\* \* \* identify competing, overlapping, duplicative or inefficient [telecommunications] programs." Another is to coordinate the development of policy, plans, programs, and standards for the mobilization and use of the Nation's telecommunications resources in any emergency.

Thus, OTP is the primary focal point in the Federal Government for telecommunications policy and coordination. It currently chairs the Interagency Warning Steering Group, whose membership consists of representatives from the management agencies and the principal operating agencies.

The Department of Housing and Urban Development, through the Federal Disaster Assistance Administration, has responsibilities dealing with relief from civil emergencies and disasters. The Federal Preparedness Agency in the General Services Administration is responsible for continuity of civil Federal Government operations in attack situations. Both agencies must concur in any OTP policy statement concerning Federal warning system usage prior to its issuance.

The Federal Communications Commission (FCC) is responsible for (1) regulating interstate communication carriers and broadcast stations, (2) protecting the right of broadcast station managers to retain control of their station under FCC jurisdiction, and (3) developing national emergency preparedness plans for communications carriers, broadcast stations and other FCC licensed facilities.

The National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce is responsible for preparing and issuing forecasts and warnings of critical weather and other emergencies to the general public and designated local authorities. This role is performed through its National Weather Service.

The Defense Civil Preparedness Agency (DCPA), Department of Defense, is responsible for development and operational control over attack warning systems. The President is authorized to make civil defense and other Federal communications systems available to Federal agencies and State and local governments for the purpose of providing warnings of disasters. DCPA is also known by its earlier name--Office of Civil Defense. The Army Communications Command maintains the Federal portion of attack warning systems in accordance with DCPA guidance.

The Department of Transportation, through the Federal Aviation Administration and Coast Guard, operates specialized aviation and marine weather forecast and warning dissemination services, respectively.

#### FEDERAL WARNING SYSTEMS

There are 12 Federal warning systems now being planned, developed, or operated. Seven specialized systems are described beginning on page 5. There are five general purpose natural disaster and attack warning systems costing \$17 million for fiscal year 1976 and the transitional quarter

(July 1, 1975 to September 30, 1976) and an estimated total cost of over \$182 million through fiscal year 1980. These five general purpose systems use voice (radio and telephone) and record (primarily teletype) communications to disseminate warnings through Federal, State and local government centers, institutions, and commercial radio and television networks to the public. All five systems are under operational control of NOAA and DCPA, as shown in the following table.

<u>Sponsor</u>	<u>System</u>	<u>Method of operation</u>
Commerce	Weather Radio	Government radio transmitters to special radio receivers purchased by the public, mass media, or other entities.
Commerce	Weather Wire	Teletype to newspapers and radio and television networks.
Commerce	Satellite	Satellite transmission to special radio receivers purchased by the public, mass media, or other entities.
Defense	National Warning	Telephone from Federal warning centers to Federal, State, and local civil defense authorities.
Defense	Decision Information Distribution	Government radio transmitters to receivers at Federal, State, and local centers and radio and television networks.

#### NOAA Weather Radio System

The Weather Radio System provides direct and continuous weather forecasts and warnings 24 hours a day from local weather service offices. Because of the Weather Radio System's ability to transmit information to the general public both directly and through commercial broadcast stations, an agreement was made between NOAA and DCPA to allow the transmission of attack warnings as well as weather information over the system. Additionally, OTP has designated the Weather Radio System as the single home warning system for use by the Federal Government.

The NOAA Weather Radio System has 77 of the planned 331 radio transmitters in operation. Each transmitter could provide coverage to areas of about a 40-mile radius. When

the system is fully implemented in 1978, NOAA estimates that about 90 percent of the population will be within reach of its broadcasts. The public can currently purchase weather radios with tone alert capability 1/ for about \$15 and up.

#### NOAA Weather Wire Service

The Weather Wire Service is used to disseminate weather forecasts and warnings to the mass media. This service operates 24 hours a day in 36 States and the District of Columbia through teletype networks which are connected to local circuits for subscribing newspapers and radio and television networks. NOAA pays the long-line charges for the network; the subscribers pay for the local circuits and terminal equipment.

NOAA intends to complete the service nationwide in fiscal year 1976.

#### NOAA Satellite Disaster Warning System

NOAA and National Aeronautics and Space Administration (NASA) officials informed us that the Satellite Disaster Warning System is being defined and developed to become operational in the mid-1980s. As planned, this system would provide 100-percent coverage of the 48 contiguous States and would transmit weather forecasts and warnings directly to special receivers purchased by the public.

#### DCPA National Warning System (NAWAS)

The NAWAS is the primary attack warning system which operates through telephone linkup of National Warning Centers with State and local civil defense authorities. According to an agency official, it is complete at the national, regional, and State level. DCPA plans to continue adding terminals in local areas at the rate of 200 per year through 1988.

#### DCPA Decision Information Distribution System (DIDS)

DIDS is being developed for attack warning to provide national coverage directly to tone-activated voice and teletype receivers at Government centers, institutions, and the

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1/ The tone alert capability provides an automatic tone signal to alert the user of pending warning messages even when the radio receiver is otherwise silent.

radio and television networks. It would also directly activate local siren warning systems.

The first DIDS transmitter, located in Edgewood, Maryland, was completed in May 1974 and is undergoing operational tests and evaluation. Beginning in fiscal year 1978, DCPA plans to add 11 additional transmitters at a rate of 1 or more a year until the system is completed.

#### Specialized warning systems

The seven specialized systems will cost \$42 million for fiscal year 1976 and the transitional quarter and over \$170 million through fiscal year 1980.

These seven systems differ from general purpose systems in that they either have: (1) specific warning functions--tsunami (tidal wave), flash flood, and Washington, D.C., local area systems or (2) primary missions other than warning--Federal Aviation Administration and NOAA Aviation Weather Dissemination Services, Coast Guard National Distress System, and FCC's Emergency Broadcast System (EBS).

While having some warning capability, the specialized warning systems and EBS are not considered competitors with general purpose national warning systems and therefore were not examined in detail.

The specialized warning systems may, however, be used to augment the general purpose systems. For instance, the purpose of EBS is to provide the President a means to issue emergency messages of any nature to the public through the mass media. FCC is developing plans and procedures to use local elements of the existing EBS to provide a link between Federal warning systems and commercial radio and television broadcast stations on a systematic basis. Each of the general purpose warning systems relies directly or indirectly on the broadcast stations to carry out their warning function. There are over 8,500 participating radio and television stations in EBS.

Appendix I lists the costs and other characteristics of general purpose and specialized warning systems. Appendix II shows the relationship between the systems.

In addition to its expenditures on Federal warning systems, the Federal Government, through DCPA, operates a matching grant program with local communities to purchase and operate sirens and other alert devices.

This program costs DCPA about \$1.8 million a year to buy and install equipment and \$1 million a year to operate.

#### SCOPE OF REVIEW

We examined background information, correspondence, congressional testimony, and appropriate regulations in addition to interviewing officials primarily at the following Federal agencies in the Washington, D.C., area: the Office of Telecommunications Policy, the Federal Communications Commission, the Department of Transportation, the National Oceanic and Atmospheric Administration, and the Defense Civil Preparedness Agency. We also interviewed officials from the Washington, D.C., offices of the American Telephone and Telegraph Company, and the National Association of Broadcasters.

## CHAPTER 2

### OVERLAPPING WARNING SYSTEMS BEING

#### DEVELOPED OR EXPANDED

NAWAS and Weather Radio should provide an adequate means of warning the general public of natural disasters and enemy attacks. Many improvement or enhancement features used or proposed for other systems could be included in these two systems without completing or continuing development of the other more expensive systems. Also, DCPA's NAWAS is being linked with NOAA's Weather Radio. This linkup permits live dissemination to Federal, State, and local officials, as well as directly to radio and television stations, institutions, and the public having specially equipped receivers.

Radio and television stations are now and probably will remain the primary means of reaching the public. FCC is developing plans and procedures to use local elements of the existing EBS to provide a link between Federal warning systems and broadcast stations on an organized basis. We believe that such measures would be more cost effective than expanding or developing additional warning systems.

NOAA and DCPA, however, are developing or expanding three other systems having a warning mission or capability without adequately determining their cost effectiveness over NAWAS and Weather Radio. Developing, implementing and operating these three systems could exceed \$140 million through fiscal year 1980. By then, national coverage will be completed for only the least costly of the three systems. In contrast, NAWAS and Weather Radio are expected to cost about \$42 million in the same time period.

#### DEVELOPMENT OF A SATELLITE WARNING SYSTEM

During fiscal year 1975, NOAA asked NASA to further define and develop a Satellite Disaster Warning System in order to meet the needs of a disaster warning system in the 1980s. If approved, development of this system would cost about \$81 million through fiscal year 1980. Thus far, \$185,000 has been spent for a feasibility study completed in January 1975. NASA may, unless directed otherwise, continue to fund system definition studies and consider the merits of starting system development.

A NOAA official explained that the Satellite Disaster Warning System is envisioned as a "second generation"

system, replacing the Weather Radio System in the mid-1980s. This official justified the system as being needed to make disaster warnings directly available to 100 percent of the population willing to purchase home warning receivers.

We question whether the Satellite Disaster Warning System can be justified on a cost-effective basis. When completed in fiscal year 1978, the NOAA Weather Radio broadcasts will be within reach of about 90 percent of the population according to NOAA. Plans are being made to provide service for the remaining 10 percent, who are outside the range of the Weather Radio transmitters, indirectly through commercial radio and television stations by linkup to Weather Radio transmitters.

It should be noted that population coverages cited by NOAA assumes that all households within the coverage area will buy tone-activated receivers. However, a recent study conducted for OTP showed that only about 20 percent would buy tone-activated receivers, even if the receiver price were held under \$25. While this is about what a Weather Radio System receiver would cost, it is considerably less than the price estimated for a Satellite Disaster Warning System receiver.

Since satellite receivers would cost more than Weather Radio receivers, it is likely that even less than 20 percent of the population would buy them. Therefore, the radio and television stations probably will remain the primary means to alert the public. If so, further expenditures for satellite warning system purposes should not be made.

In July 1975 OTP sent a letter to NOAA recommending against proceeding with this system to meet disaster warning needs. Yet NASA has funded, and may, unless directed otherwise continue to fund system definition studies.

When completed, the cost of the satellite system would be several times the cost of the Weather Radio System. Before further expenditures are made, a study should be conducted to determine whether a satellite system would be more effective in reaching the public than would use of existing systems. Among other things, it should address the practicality of phasing out the Weather Radio System once several million receivers are in the hands of the public, in lieu of a system requiring new and much more expensive receivers. Such a study has not been made.

While neither NOAA nor NASA disagreed with these recommendations in their official comments to our preliminary report, there was no indication that corrective action would be taken.



DCPA DECISION INFORMATION  
DISTRIBUTION SYSTEM

DCPA plans to operate two systems to provide attack warnings to the public. The NAWAS now serves as the primary attack warning system. DCPA also plans to expand DIDS. In 1975 DCPA and NOAA agreed that Weather Radio could disseminate attack warnings to the public and they agreed to link the system to NAWAS for that purpose. This would result in two federally sponsored radio broadcasting systems (DIDS and Weather Radio) in addition to the NAWAS telephone system.

DCPA's warning system objectives are to provide a rapid, reliable, and relatively invulnerable means of sending a warning message to 90 percent of the population, using--to the maximum degree--existing resources adaptable to this purpose.

The present attack warning system is a mixture of Federal, State, and local networks. The Federal portion (NAWAS) is a two-way party-line telephone network, operated at an annual cost of about \$2.5 million. It consists of the three National Warning Centers, eight Regional Warning Centers, a primary warning point in each State, plus over 2,000 other warning points. These other warning points are located in (1) police, fire, or other facilities which are manned full time and (2) local civil preparedness offices, primary and alternate emergency operations centers, and most National Weather Service Offices which are generally manned only during business hours except during emergencies. It is planned to expand these warning points at the rate of 200 per year through 1988 to include all county seats and population centers of over 25,000. It costs about \$100,000 annually for each additional 200 warning points.

When configured for maximum coverage, all points on the system are connected in a conference circuit arrangement, referred to as the National Warning Circuit. In addition, there is a control circuit connecting 24 key locations, including the Associated Press and United Press International news services. We were advised by DCPA officials that it takes about 25 seconds or less to transmit the warning message to all points on the National Warning Circuit.

After the national warning message is received at the warning points, the warning must be fanned out by activating sirens, bells, or warning messages over State, local, and other secondary networks or systems. Various actions are required in this fanning-out process resulting in a range of

dissemination from immediate to considerable time delay. This is because the relay is primarily manual, although some secondary systems are activated automatically. Thus the NAWAS warning message or signal reaches the public in periods ranging from instantaneous to up to one-half hour or longer after the national message has been received.

There is a great deal of backup capability in the NAWAS. For instance, a separate warning message is sent over the control circuit to the Associated Press and United Press International news services. From these points, the warning message is transmitted over their networks by teletype to about 6,800 radio and television stations. Such relays reach the public in about 5 minutes.

Also, most of NOAA's Weather Service offices are warning points on the NAWAS system and can transmit the warning (live) over the 77 Weather Radio transmitters (NOAA plans to expand Weather Radio to a total of 331 transmitters by 1978). We were advised by DCPA officials that the warning could be received by radio and television stations, other institutions, and citizens that have appropriate receivers through this means within 30 to 60 seconds after the national warning message was received. DCPA and NOAA established procedures, in 1975, for the linkup of NAWAS and Weather Radio; however, the procedures provide for manual rather than automatic relay.

The underlying reason for the development of DIDS was the need for faster warning in view of the technological advancement in nuclear weapon delivery systems. DCPA estimates that as little as 15 minutes will be available from the time indications of nuclear attack are received at the primary National Warning Centers.

When fully implemented in the mid-1980s, DIDS is estimated to cost \$73 million. It will consist of the 3 existing National Warning Centers, 2 control transmitters, 10 distribution transmitters, and about 40,000 receiver terminals. These terminals will be (1) 33,000 voice receivers located at Federal, State, and local emergency operating centers, NAWAS warning points, and State officials and agency offices; (2) 1,500 radioteletype receivers at selected radio and television broadcast stations, Federal, State, county, city, and military emergency operating centers; (3) 300 siren system terminals used to activate local siren systems; and (4) 5,000 siren terminals used to activate single community sirens. At present, the 3 National Warning Centers and only 1 distribution station and about 500 voice receivers are in place, although the cost has been in excess of \$10 million.

DIDS can be used to activate selected portions of the system or it can reach all 40,000 terminals simultaneously and automatically. DIDS is designed to sound sirens and begin to deliver warning messages within 30 seconds after the system is activated by one of the National Warning Centers.

In justifying DIDS, in addition to NAWAS and Weather Radio, DCPA officials stated that:

- DIDS could provide more rapid and effective warning than NAWAS by simultaneous broadcast to 40,000 terminals as opposed to NAWAS 2,000.
- DIDS has nuclear weapon survivability features not available on NAWAS and Weather Radio.
- DIDS has reliability features and receiver standards which have not been established for Weather Radio.
- DIDS could provide more complete coverage and selective area warning than Weather Radio.
- NAWAS could be reduced to about 500 terminals with full deployment of DIDS and this would offset part of the cost of DIDS.

Our evaluation of these statements follows:

- Response time - Although currently the fan-out time of NAWAS ranges from a few minutes to a half hour, the planned manual linkup of NAWAS and Weather Radio will provide warning information to entities and citizens having appropriate receivers in 60 to 90 seconds. Further reductions in response time would be possible by automating the linkup. The same type and quantity of terminals planned for DIDS to reach a large segment of the population simultaneously could also be programmed for Weather Radio including automatic activation of sirens.
- Survivability - The need for survivability appears to be more critical for DIDS than for Weather Radio since there would be only 10 DIDS stations as opposed to 331 Weather Radio stations. Loss of a DIDS station would affect a much greater percentage of the population than a Weather Radio station. For example, the current DIDS prototype station provides service to 50 million people, whereas, there are many Weather Radio stations in this same 10-state area. Also we

were informed by an official of DCPA that certain survivability improvements, such as backup power supply could be added to the Weather Radio stations at reasonable cost. NAWAS already has considerable survivability features and several backup communication facilities are available if needed.

--Reliability - The lack of spare parts, backup power, and receiver standards which may impair the reliability of Weather Radio appear to be deficiencies which could be resolved between DCPA and NOAA. If such reliability features are needed for DCPA's attack warning, they should be beneficial for NOAA's natural disaster warning function also without establishing an entirely new system.

--Coverage - When fully deployed, DIDS would be able to reach about 96 percent of the population according to DCPA. When completed, Weather Radio will be available to about 90 percent of the population and plans are being made by NOAA to reach the remaining 10 percent through other means, such as cable television. Also, Weather Radio stations are comparatively inexpensive and additional ones could be added if necessary to meet DCPA requirements. While DIDS has the capability of selectively activating warning receivers in a small geographical area, which allows receivers elsewhere in the coverage area of a transmitter to remain silent, this feature is primarily a requirement for natural disaster warning rather than attack warning. This feature is essential for a system, such as DIDS where transmitter range is several hundred miles, for natural disaster warning purposes. However, Weather Radio is a short range, about 40 miles radius, system which does not require a special selectivity feature for natural disasters. Also, geographical selectivity for attack warning is inherent in the short range of the Weather Radio transmitters, which are being linked with NAWAS.

--Reduction of NAWAS - NAWAS has certain advantages over DIDS; thus, reduction of NAWAS in favor of DIDS may not be feasible or cost effective. NAWAS is a two-way communications system used extensively at the local level for government-to-government command and control during severe weather conditions and civil disorders. One DCPA official expressed doubt that NAWAS could be reduced. For instance, DCPA's poll of DIDS receiver-owners in the test area showed that most were unwilling to replace NAWAS with DIDS because of its lack of two-way capability.

Although there may be certain local or city level NAWAS warning points not requiring two-way communications which could be replaced with less expensive one-way voice radio receivers, we believe this potential cost offset does not justify implementing DIDS. DIDS and Weather Radio receivers designed to the same reliability standards should cost about the same. Thus, if the DIDS voice receivers could replace certain NAWAS terminals, it appears equally feasible to replace them with Weather Radio voice receivers. Although DCPA is concerned about the lack of Weather Radio receiver reliability standards, DCPA could specify minimum design standards for receivers purchased with its funds.

DCPA officials stated that our proposals appear to assume that the Weather Radio System is a national system when in fact it is many separate independent stations. Although this system does, as DCPA says, consist of separate independent stations, each station is being linked to NAWAS. Also, FCC's plans for integrating Federal, State, and local warning systems with the broadcast industry will provide a systematic means of reaching radio and television stations. Therefore, Weather Radio linked with NAWAS should be an effective national, as well as State and local warning system.

We believe that DCPA needs to give more serious consideration to capabilities that could be available with (1) an optimum NAWAS and Weather Radio linkup, (2) potential reliability and survivability improvements that could be made to Weather Radio, (3) the plan for using EBS to link Federal, State, and local warning systems with radio and television stations, and (4) making more Weather Radio receivers available to local jurisdictions, schools, hospitals and other public institutions so that more of the population could receive warnings directly. Such measures may prove to be more cost effective than implementing another warning system with its own unique receiving equipment.

DCPA officials agreed in August 1975 that cost-effectiveness studies of current warning options should be made before the decision is made to deploy DIDS. DCPA has contracted for a cost-effectiveness study of current Federal warning system options. This study is scheduled to be completed early in calendar year 1976. We believe that there are sufficient doubts and unanswered questions about the need for, and benefits of, a second radio broadcast warning system that further development or implementation should not be undertaken until the requisite studies are completed and evaluated.

## NOAA WEATHER WIRE SERVICE

The Weather Wire Service teletype system disseminates weather and warning information to over 2,000 subscribers, of which over 1,500 are radio and television stations. The system is being expanded in 1976, using leased services, to provide nationwide coverage. The NOAA Weather Radio, which is scheduled for completion in 1978, also carries both weather and warning information.

In justifying continued expansion and operation of the Weather Wire Service while implementing the Weather Radio, NOAA officials state:

- Warning information should be disseminated through multiple means.
- Weather Radio is a voice system and radio and television stations desire printed copy of weather information for use in broadcasting.
- Weather Wire carries a wide variety of specialized information and regional and national weather forecasts to satisfy the diverse interests of the subscribers. Weather Radio cannot carry this large amount of information since its broadcasts must be kept brief enough to retain public interest.
- Discontinuing Weather Wire would not eliminate all Government circuitry requirements because portions of the Weather Wire circuitry are used for such functions as (1) relaying hydrologic data among NOAA, the Corps of Engineers, and the Geological Survey and (2) relaying weather data among National Weather Service offices.
- Because Weather Wire personnel also operate the Weather Radio and perform other functions, only the leased circuitry cost of about \$1.7 million annually, beginning in 1976, could be saved if Weather Wire is discontinued.

While recognizing the merit of several points raised by NOAA officials, we believe that NOAA should examine the cost effectiveness of operating two weather forecast and warning systems at Government expense. For instance:

- The need for multiple delivery of warning information appears to be available without the Weather Wire Service. In addition to the basic general purpose warning

systems--NAWAS and Weather Radio System--NOAA can use press wire services and local elements of the EBS to reach radio and television broadcast stations. Also, the Weather Radio broadcasts messages directly to institutions and citizens having specially equipped radio receivers.

- NOAA officials acknowledged that the printed copy of information provided through the Weather Wire Service is not necessary for warning purposes if voice communications such as Weather Radio are available. Also, voice messages provided by Weather Radio can be automatically recorded on special equipment by the broadcast stations.
- The large quantity of information carried on Weather Wire should be examined by NOAA to determine if all the information is needed or if it could be condensed for Weather Radio broadcasts. We noted that the radio and television stations condense the Weather Wire information for their brief weather broadcasts. Also, representatives of broadcast stations have questioned the need for some of the information being provided over Weather Wire. A poll by NOAA of subscribers in one state indicated that the types of information desired could be provided by the Weather Radio System. NOAA disaster survey reports also show that the large volume of information provided by Weather Wire has caused confusion and contributed to delays in broadcasting warnings by radio and television stations during tornado outbreaks.
- Although portions of the Weather Wire circuitry are used for other functions such as relaying hydrologic data, the bulk of the \$1.7 million annual circuitry cost is attributed to the intrastate circuitry used to carry weather and warning information to subscribing radio and television stations. Thus, if the latter function of Weather Wire could be provided by Weather Radio, most of the \$1.7 million circuitry cost could be saved.
- Although Weather Wire personnel perform multiple functions there may be some personnel savings by discontinuing Weather Wire. We noted that 49 personnel positions were requested for the Weather Wire expansion. Also, the \$1.7 million annual circuit lease costs for Weather Wire are significant even if personnel costs could not be reduced.

In addition to the redundancy of Weather Wire and Weather Radio there are indications that Weather Wire may not be an effective warning system. NOAA natural disaster survey reports concerning the April 1974 tornado outbreak over much of the Eastern United States and Hurricane Agnes, which struck the east coast in 1972, indicated many problems with the system. Dissemination of warnings to the public was limited because many stations did not subscribe to the Weather Wire Service. Only about 15 percent of the Nation's 9,000 radio and television stations subscribe to the service and, at present, the service is available in 36 States. Subscription cost was the reason most frequently given for not subscribing.

Also, Weather Wire was inefficient due to the inherent slowness of manual teletype processes and complex procedures for interstate relaying of messages. Conversely, broadcasts over Weather Radio proved to be a more rapid means of sending warnings directly to hospitals, schools, local action agencies, or the public.

Further, neither the Weather Wire nor the Weather Radio can be effective without substantial voluntary participation by commercial radio and television stations. As indicated, cost is a major factor in their low participation in Weather Wire. It seems doubtful that stations will be willing to participate in both systems if they can obtain needed information through one system.

We questioned NOAA officials as to the cost effectiveness of operating two weather and warning dissemination systems when use of Weather Wire alone is limited due to reluctance of potential subscribers to pay the cost of receiving equipment.

NOAA officials cite as the primary justification of the Weather Wire Service the fact that about 2,000 subscribers are willing to pay \$50 to \$100 a month for terminals to receive the service.

NOAA officials, however, could not tell us how many of the 9,000 broadcasting stations will likely carry both Weather Wire and Weather Radio receiving equipment. They knew of only one radio or television station in the Washington, D.C., area having both. These officials stated that it will take several years of dual operation to determine if sufficient voluntary use is made to justify both systems. We believe, however, that the longer Weather Wire is operated and expanded the more difficult it will become to substitute a more effective warning system.



NOAA has no organized program to strengthen the participation of the broadcast stations in disseminating weather and warning information. NOAA is, however, working with FCC to develop plans and procedures for using EBS to provide emergency and warning information to broadcast stations on a systematic basis. NOAA and FCC have discussed the possibility of placing a Weather Radio receiver in each of the 490 key EBS broadcast stations. These key EBS stations would use the EBS to relay Weather Radio warning messages to other radio and television stations in their area.

In view of the above efforts and the limited participation in Weather Wire due to cost of receiving equipment we question the cost effectiveness of continuing the separate Weather Radio and Weather Wire Systems. Therefore, before expanding Weather Wire to provide nationwide coverage, we believe NOAA should conduct a formal study to determine whether essential services could be provided by Weather Radio.

NOAA officials stated that if a formal cost-effectiveness study were to be done as suggested it would take so long that the Weather Wire expansion provided for in the fiscal year 1976 appropriation would have to be delayed significantly, resulting in a de facto deferral of the 1976 appropriation implementation. However, the need for expansion of Weather Wire has not been supported by requests for such service from States not having Weather Wire. Therefore, the urgency of expanding Weather Wire at an additional cost of \$1.5 million annually has not been demonstrated.

## CHAPTER 3

### A CONSOLIDATED FEDERAL WARNING

#### PROGRAM HAS NOT BEEN ACHIEVED

Due to the division of responsibility and authority among the Federal agencies engaged in management and operation of warning systems, there is no single entity which can determine requirements and prevent system proliferation. (See pp. 1 and 2.) Although OTP has responsibility for coordinating telecommunications activities of the executive branch, it does not have budgetary control over Federal warning systems expenditures, and it can only recommend to the Office of Management and Budget that a system's funding be curtailed.

OTP has attempted to work with agencies to coordinate Federal warning activities, leading to a consolidated warning system. But these coordination efforts have not been fully effective. Expenditures for developing, expanding, or operating several Federal warning systems, some of which appear to have overlapping coverage and requirements, have continued.

#### EARLY COORDINATION EFFORTS

Interagency coordination to survey warning systems to alert the public began in 1965 under the leadership of NOAA. This effort led to a recommendation for a single disaster warning system. By 1969 the Office of Emergency Preparedness concluded that an indepth study was needed to examine specific Federal agencies and systems involved in warning the public. In December 1970 at the request of the Office of Emergency Preparedness, OTP established an Interagency Warning Steering Group to review the area of home warning. Until the home warning issue was resolved in 1974, this area dominated OTP and interagency coordination efforts. An OTP official said this group addressed the capabilities and costs of existing and planned home warning systems. Also, the issue of voluntary versus compulsory procurement of home warning receivers was examined.

As a result of these efforts, OTP issued policy statements in 1971 and 1975. These statements affirmed the voluntary nature of home warning receiver procurement and expressed OTP's interest in proposed home warning systems and market demand for home warning receivers. Their purpose was to insure that "the Federal Government \* \* \* would establish a rapid, reliable warning capability, and \* \* \* bring the cost of a warning receiver within the reach of every American household."

The 1971 statement summarized the results of a review of existing and planned home warning systems. Six systems were specifically identified in the policy statement: DIDS, the NOAA Weather Radio System, the Satellite Disaster Warning System, a warning capability superimposed on the telephone system, and two systems using the radio and television networks. While the NAWAS and the NOAA Weather Wire Service were then in existence, they were not discussed because they did not have home warning capability.

Of these systems, DIDS was considered the most technically feasible home warning system and OTP authorized a series of studies and tests to insure that the system performed as expected and that its receivers would be affordable by all. However, it was further noted that if tests showed the receivers could not be inexpensively procured on the commercial market, then other available options would be considered.

DIDS was still being tested in 1974, when the first DIDS transmitter was completed. By then, several cost-benefit studies examining this system and other warning systems, primarily the NOAA Weather Radio System, had been done for OTP by the Department of Commerce. These studies showed the Weather Radio System to be a more cost-effective system to the Government and the public.

OTP informally discussed ongoing efforts with the Interagency Warning Steering Group members and in July 1974 the group reconvened for the first time since 1971. The task of the group was to assume an ongoing role to coordinate the total warning dissemination function. On the basis of its work, the group agreed in September 1974, that DCPA and NOAA would work together to (1) use NOAA's Weather Radio System to augment DCPA's attack warning system, (2) decide how sirens would be used in conjunction with NOAA Weather Radio, and (3) optimize plans to provide warning information to the radio and television networks. OTP's Policy Statement, issued in January 1975, contained these agreements.

The 1975 policy statement also designated NOAA's Weather Radio System as the only federally sponsored warning system which could be operated for home warning. This statement made clear that NOAA Weather Radio was now chosen over DIDS because (1) its receivers were already on the market, (2) the Weather Radio provided a routine daily weather forecast tailored to local areas, and (3) the Federal investment to complete this system would be much less than DIDS.

COORDINATION EFFORTS SINCE THE  
1975 POLICY STATEMENT

Through June 1975, the group convened three times to discuss planned actions to implement the most recent policies. During these meetings, the group agreed to restrict its concern to integrating existing component warning systems without unnecessary duplication.

By June 1975, the following actions were taken in the three areas cited for coordination in the policy statement:

--NOAA and DCPA agreed to plans and procedures for providing live attack warnings over the NOAA Weather Radio System.

--DCPA provided a draft resolution which encourages local communities to provide the nearest Weather Service Office with a direct link to sirens and radio and television stations in order to disseminate warning information directly to the public. However, the resolution was rejected by OTP because it went beyond its scope. This area still needs to be addressed.

--FCC is developing a model plan for use and control of EBS for local warning.

An OTP member has suggested the next area to be examined will be a clarification of warning system responsibility between the Federal, State, and local governments. This area is important as many States and localities have their own emergency warning systems which interface with Federal warning systems. Also, State and local officials are at times unsure of their authority to activate EBS for disaster warning.

In this connection, FCC in cooperation with NOAA and DCPA, is developing a nationwide plan to increase the use of EBS for local emergency warning purposes. Indicative of the work to be done is the fact that despite the severity of recent natural disasters there have been relatively few requests to activate EBS. The basic problem appears to be a lack of explicit procedures for activating EBS at the State and local levels. FCC's planning includes efforts to clarify procedures and avoid misunderstandings that currently exist on the State and local level.

FCC officials believe that use of the existing EBS would provide NOAA and DCPA, as well as other Federal, State and local officials the most cost-effective method of

reaching the public through the broadcast medium. EBS already includes a capability to use the facilities and personnel of the entire broadcasting industry on a voluntary, organized basis at minimum cost to the Government without duplicating interface equipment for connection to multiple systems.

REQUIREMENTS OF A CONSOLIDATED  
WARNING SYSTEM NOT DEFINED

While the OTP and Interagency Warning Steering Group have made some efforts to coordinate their activities, much work remains to be done.

In a 1970 study of Federal warning systems, OTP made an observation which is still true:

"Telecommunications warning systems do overlap. In some cases, this may be desirable, but the necessary degree of overlap can be stated only after a technical in-depth analysis of warning requirements."

Some progress has been made. NAWAS is being linked with NOAA Weather Radio. This linkup permits live dissemination to local civil defense officials, radio and television networks, and home warning receivers. With feasible improvements and enhancement, these two systems should be adequate to warn the public of natural disasters and enemy attacks. However, other overlapping systems are being developed and operated. These were discussed in chapter 2.

We asked an OTP official why operational requirements for a consolidated warning system had not been defined. He replied that OTP does not have the authority to define operating requirements for warning systems; it can only question the development or expansion of overlapping systems. We agree that OTP's charter does not authorize it to define requirements. The Interagency Warning Steering Group contains all the agencies which have authority to define these requirements. This fragmented authority appears to be a major impediment to achievement of a consolidated Federal warning system.

## CHAPTER 4

### AGENCY COMMENTS AND OUR EVALUATION

We brought our findings to the attention of OTP, DCPA, NOAA, FCC, NASA, the Department of Housing and Urban Development, the General Services Administration, the Department of Transportation, and the Office of Management and Budget in a preliminary report dated October 31, 1975.

We proposed that the Director, OTP, through chairmanship of the Interagency Warning Steering Group, (1) seek sufficient authority to consolidate Federal warning efforts, (2) define total requirements for a consolidated national warning system, (3) determine the most operationally and cost-effective arrangements to meet those requirements, and (4) take steps to discontinue other systems unless justified for purposes other than warning.

Because of their volume, the 41 pages of comments were not incorporated in this report. However, specific agency comments at variance with facts or statements reported in the draft report were considered and discussed previously in appropriate portions of this final report. We have summarized their principal comments below together with our evaluations.

There was general agreement with our overall proposal that OTP, through the Interagency Warning Steering Group, should oversee the definition and consolidation of Federal warning requirements and the development of an integrated national warning program to meet those requirements in the most operationally and cost-effective manner. However, there were differing opinions as to whether OTP should have sufficient authority to carry out the recommendations and to prevent system proliferation. The two principal operating agencies (NOAA and DCPA) appeared to be concerned primarily with justifying continued development and operation of their own systems to meet their individual requirements and responsibilities.

The Acting Director, OTP, stated that the failure to coordinate all of the warning functions at a central focal point is probably the primary cause of the situation described in our report, but under existing authorities there is no mechanism for any single entity to control Federal warning efforts.

The Deputy Director, Office of Management and Budget, said that, rather than depriving agencies of their

responsibilities or seeking new authority, he believes that OTP's existing authority to plan and coordinate is sufficient. He added that it may be necessary for OTP to increase its efforts to formulate and coordinate Federal policy on warning the public. He proposed that OTP, through its chairmanship of the Interagency Warning Steering Group, develop a solution to the apparent lack of coordination among the member organizations, and offered his agency's assistance to the group on a consultant basis.

The Administrator of NOAA said OTP has, through chairmanship of the Interagency Warning Steering Group, effectively coordinated the development of policy pertaining to warnings. He, therefore, does not agree that OTP authority should be broadened.

The Director, DCPA, said he does not believe a policy and coordination body should be put in the position to develop and control warning systems which could prevent a department or agency with legally assigned responsibilities from carrying out its programs. Program decisions, he added, should be made by heads of departments and agencies and the President through the Office of Management and Budget.

It is our opinion that OTP could increase its efforts to prevent proliferation of Federal warning systems by exercising its authority to identify competing, overlapping, duplicative or inefficient telecommunications programs, and to make recommendations to appropriate agencies and the Office of Management and Budget concerning the scope and funding of such programs. OTP has, through chairmanship of the Interagency Warning Steering Group, made significant progress in coordinating Federal warning efforts. However, individual warning systems continue to be operated and expanded. As stated by one Congressman, these systems are not only economically wasteful, but the fragmented efforts were failing to achieve effective systematic warning coverage throughout the United States.

OTP does not believe it has the authority to define operational requirements. To do so requires the agreement of all of the agencies involved and such agencies have defended their legal responsibilities tenaciously. Thus, progress has been slow resulting in compromise solutions and system proliferation rather than optimum planning.

In his comments, DCPA's Director stated that our report stresses only cost whereas DCPA requirements are based on the need to save lives. He added that saving lives requires a survivable system, namely DIDS, in an initial or follow-on

nuclear attack situation, in each of the preattack, transattack, and postattack periods.

We appreciate the consequences of nuclear attack and fully agree with the objective of saving lives. However, we believe the most effective means to achieve this objective is to provide systematic coverage to reach the maximum number of people through a less expensive but reasonably survivable integrated system.

Like Weather Radio, DIDS would rely heavily on radio and television stations to reach the public for attack warning. Rather than installing hardened DIDS transmitters, it appears that an alternative worthy of consideration would be to improve survivability of Weather Radio similar to improvements to 600 radio and television stations participating in the EBS Broadcast Station Protection Program. This program is funded by DCPA to provide these broadcast stations with reserve power generators, nuclear fallout protection, and other nuclear attack survivability features.

Also, since the 10 DIDS transmitters are not designed to survive direct hits, it appears that the 331 Weather Radio transmitters would have a distinct survivability advantage. As previously discussed on page 11, the loss of a single DIDS station could affect an area covering as many as 50 million people.

In addition, warning systems, including attack warning systems are most frequently used for natural disasters rather than enemy attack. Therefore, we believe that available resources could be used more effectively for saving lives by enhancing the survivability and receiver coverage, in schools and other public institutions, of the Weather Radio than by installing new nuclear-hardened DIDS transmitter facilities. This should enable a greater percentage of the population to take protective measures before a disaster. For instance, in hearings before the House Subcommittee on Communications and Power of the Committee on Interstate and Foreign Commerce in July 1974, the Director of the National Weather Service acknowledged that the Weather Radio could be tied in relatively inexpensively with every media outlet in the country. He also pointed out the existing extreme vulnerability of school systems to tornadoes and other rapidly developing weather emergencies. He expressed the opinion that a Weather Radio tone-alert receiver in each school would be of tremendous advantage.

DCPA also contends that DIDS can provide postattack communications to assist in national recovery. This function,



however, is a postattack role rather than warning role--the primary reason for the DIDS development. Before justifying DIDS for this function, its cost benefits should be compared with other communications systems operated for that purpose, such as the civil defense voice and teletype command and control systems and the Government's common-user telephone and record communications systems. Some of the military and civil defense communications systems are being provided survivability protection against nuclear attack. Also, because OTP has designated Weather Radio as the home warning system, DIDS can no longer use its tone-alert receivers to disseminate national recovery messages directly to the public. It would have to rely on surviving radio and television stations and State and local systems to relay these messages to the public. These are the same media used by NAWAS and Weather Radio, which have the added advantage of accessing home warning receivers.

## CHAPTER 5

### CONCLUSIONS, RECOMMENDATIONS, AND MATTERS

#### FOR CONSIDERATION BY THE CONGRESS

##### CONCLUSIONS

Linkup of the NOAA Weather Radio System--selected by OTP as the Federal home warning system--and DCPA's NAWAS could be made adequate for economical and effective dissemination of natural disaster and attack warnings to the public. These systems can reach the public through several media including sirens, radio, television, local warning systems, and direct broadcast to weather radios currently being sold to the public.

With planned or feasible improvements, NAWAS and Weather Radio together could provide warnings in less than 90 seconds to the same terminal points maintained or planned for other warning systems. Weather Radio, linked with NAWAS, has distinct advantages in the large number of dispersed transmitters--331 compared with 10 for DIDS--the large number of Weather Radio receivers on the market for use by the public, and the favorable system cost compared with the cost of other existing or proposed warning systems. (See ch. 2.)

NOAA's Weather Wire Service and warning satellite systems and DCPA's DIDS appear redundant. Costs of these systems could exceed \$7 million in fiscal year 1976 and \$140 million through fiscal year 1980. By then only the Weather Wire Service would be complete and none of the systems would significantly increase Federal warning system effectiveness over what could be achieved through improvements to NAWAS and Weather Radio.

The Weather Wire, DIDS, and the satellite would disseminate information to the public primarily via radio and television. Since the linked up Weather Radio System and NAWAS use these media and can also access home warning receivers, and because they provide flexibility and redundancy, the other three systems do not appear to be needed for warning purposes.

Although tone-activated receivers capable of receiving warnings directly from the weather service offices are available for public use, radio and television stations are expected to remain the primary means of disseminating warnings to the public.

To be effective, therefore, each of the above systems would require linkup with a high percentage of radio and television stations. The low subscriber rate of the Weather Wire Service indicates that broadcast stations are not willing to assume the financial and operational burden of connecting to all these systems in addition to EBS, which FCC requires.

Since July 1974, the Interagency Warning Steering Group has renewed efforts to coordinate Federal warning system development and operation. However, much work remains to be done to preclude development and implementation of unneeded systems.

Although OTP designated NOAA Weather Radio as the Federal home warning system, in part, because the Federal investment to complete this system would be much less than to implement DCPA's DIDS, no action has been taken to preclude concurrent implementation and operation of both systems. With adequate coordination of planning and design, an integrated system should be able to meet the requirements of both agencies.

We recognize that individual departments and agencies have been given authority to determine their warning requirements and to operate and manage their individual systems to carry out their missions and responsibilities. However, this should not preclude an entity with appropriate expertise, such as OTP, from consolidating such requirements and designing an integrated system taking into consideration those requirements and the cost benefits of an integrated system.

Thus, greater central authority is needed to define total Federal warning requirements and establish the most operationally and cost-effective Federal warning program. OTP feels it does not have sufficient authority to accomplish this.

#### RECOMMENDATIONS

We recommend that the President take appropriate action, including seeking new legislation if necessary, to designate OTP, through chairmanship of the Interagency Warning Steering Group, to

- define and consolidate all Federal requirements for natural disaster and attack warning to the public;
- develop an integrated national program to meet those requirements in the most operationally and cost-effective manner; and
- prevent continued operation or further development, implementation, or expansion of warning systems not

needed for the integrated program unless their coexistence with such program is formally justified for purposes other than warning.

MATTERS FOR CONSIDERATION BY THE CONGRESS

The Congress may want to consider funding constraints on certain of the natural disaster and attack warning systems, pending definition of the recommended integrated national program.

## LIST OF FEDERAL WARNING SYSTEMS IDENTIFIED BY GAO

Federal warning systems	Agency source of funding	Expected completion date (FY)	U.S. population coverage (goal) (note a)	Prime contractors	Funding requests for FY 1976 and FY 1976 transitional quarter			Total system planned expenditure FY 1976 through 1980
					Recurring costs	Expansion costs	Total request	
(000 omitted)								
<b>General Purpose</b>								
1. NOAA Weather Radio System	NOAA	1979	90%	Undecided	\$ 2,133	\$ 4,450	\$ 6,583	\$ 27,647
2. NOAA Weather Wire Service	NOAA	1976	Subscribing mass media	American Telephone and Telegraph Co.	4,841	1,819	6,660	27,972
3. Satellite Disaster Warning System	NASA	1985	100%	Undecided	-	-	-	81,000
4. National Warning System	DCPA and Army Communications Command	1988	90%	American Telephone and Telegraph Co.	3,094	69	3,163	14,363
5. Decision Information Distribution System	DCPA and Army Communications Command	1987	96%	Westinghouse and Bendix Corporations	321	300	621	31,403
					<u>10,389</u>	<u>6,638</u>	<u>17,027</u>	<u>182,385</u>
<b>Special Purpose</b>								
1. Tsunami Warning System	DCPA and Army Communications Command	Complete	20 million people	American Telephone and Telegraph Co.	Included in NAWAS			
2. Flash Flood Warning System	NOAA	1977	99 communities	J. Tech Associates and Develpro	31	132	163	334
3. Washington Area Warning System	DCPA and Army Communications Command	1980	Washington D.C., metro area	American Telephone and Telegraph Co.	297	323	620	3,150
4. Federal Aviation Administration Aviation Weather Dissemination Services (note b)	Federal Aviation Administration	1985	80% of aviator briefing requests	Various	22,901	3,902	26,803	108,620
5. NOAA Aviation Weather Dissemination (note b)	NOAA	None	80% of aviator briefing requests	None	11,681	-	11,681	50,141
6. National Distress System (note b)	Coast Guard	1976	500,000 boaters	None	1,113	1,617	2,730	7,962
7. Emergency Broadcast System (note b)	FCC	Completed	100%	None	127	-	127	535
					<u>36,150</u>	<u>5,974</u>	<u>42,124</u>	<u>170,742</u>
Total					<u>\$46,539</u>	<u>\$12,612</u>	<u>\$59,151</u>	<u>\$353,127</u>

a/Estimates assume the public and all intermediate dissemination points are listening to the system when the warning is issued. Estimates for the systems involving home tone-activated receivers assume all households within coverage area use them.

b/These systems have primary purposes other than warning. The costs shown are not limited to the percentage applicable to warning, but are total system costs.

CHART SHOWING RELATIONSHIPS BETWEEN  
FEDERAL WARNING SYSTEMS

Name of system	Primary warning purpose			Operating mode			Primary recipients				
	Warn enemy attack	Warn natural disaster	Radio transmission	Land lines (telephone/teletype)	Receivers activated automatically	2-way communications	Local/State governments (note a)	Institution (note a)	Mass media (note a)	Public	Other (note b)
<b>General-purpose:</b>											
1. Weather Radio	X		X		X			X	X	X	
2. Weather Wire	X		X	X				X	X		X
3. Satellite Disaster Warning System		X			X		X			X	X
4. NAWAS	X		X	X			X				
5. DIDS	X				X		X			X	
<b>Specialized:</b>											
1. Tsunami Warning System		X	X	X				X			
2. Flash Flood Warning System		X	X	X		X				X	
3. Washington Area Warning System			X	X		X					
4. Federal Aviation Administration Weather Dissemination Service (note c)		X	X	X		X		X			X
5. NOAA Aviation Weather Dissemination Service (note c)		X	X	X		X					X
6. Coast Guard National Distress System (note c)		X	X								X
7. Emergency Broadcast System		X		X						X	

a/Ultimately relayed to the public.

b/Boats and aircraft.

BEST DOCUMENT AVAILABLE

PRINCIPAL OFFICIALS  
RESPONSIBLE FOR ADMINISTERING ACTIVITIES  
DISCUSSED IN THIS REPORT

	<u>Tenure of Office</u>	
	<u>From</u>	<u>To</u>
<u>OFFICE OF TELECOMMUNICATIONS POLICY</u>		
DIRECTOR:		
John M. Eger (acting)	Sept. 1974	Present
Clay T. Whitehead	Sept. 1970	Sept. 1974

DEPARTMENT OF DEFENSE

SECRETARY OF DEFENSE:		
Donald H. Rumsfeld	Nov. 1975	Present
James R. Schlesinger	July 1973	Nov. 1975
DIRECTOR, DEFENSE CIVIL PREPAREDNESS AGENCY (note a)		
John E. Davis	May 1972	Present

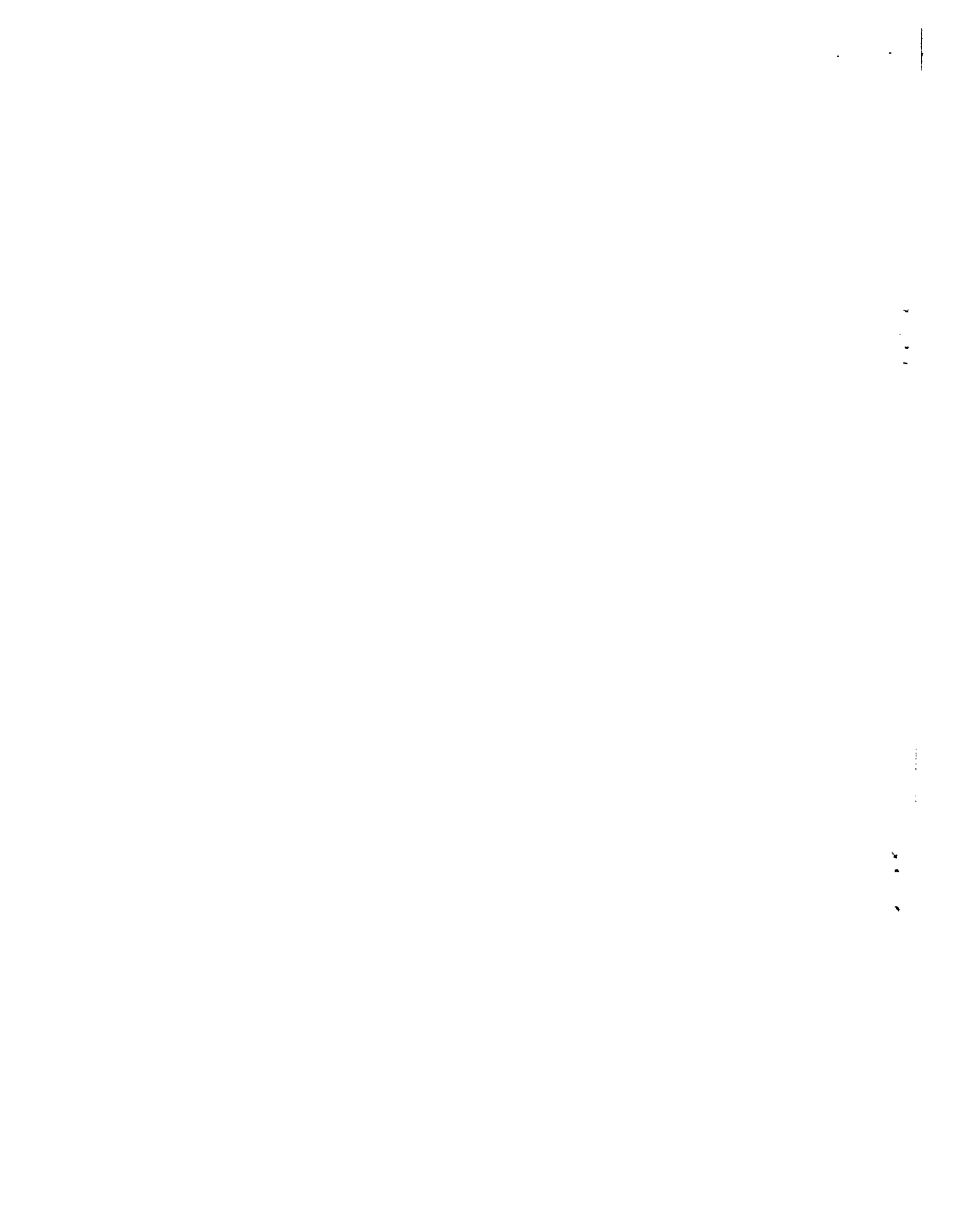
DEPARTMENT OF COMMERCE

SECRETARY OF COMMERCE:		
Williot L. Richardson	Feb. 1976	Present
Rogers C. B. Morton	May 1975	Feb. 1976
John K. Tabor (acting)	Mar. 1975	Apr. 1975
Frederick B. Dent	Feb. 1973	Mar. 1975
ADMINISTRATOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION:		
Robert M. White	Feb. 1971	Present

FEDERAL COMMUNICATIONS COMMISSION

CHAIRMAN:		
Richard E. Wiley	Mar. 1974	Present
Dean Burch	Oct. 1969	Mar. 1974

a/Before May 1972 this agency was the Office of Civil Defense.





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