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REPORT TO THE CONGRESS

72-0411



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Activities And
Status Of Civil Defense
In The United States B-733209

Department of the Army

BY THE COMPTROLLER GENERAL
OF THE UNITED STATES

095495

~~72-0411~~

OCT. 26, 1971



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

B-133209

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

This is our report on the activities and status of civil defense in the United States. Our study was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the President of the United States; the Director, Office of Management and Budget; the Director, Office of Emergency Preparedness; the Secretary of Defense; and the Secretary of the Army.

A handwritten signature in cursive script that reads "James B. Stacks".

Comptroller General
of the United States

D I G E S T

WHY THE STUDY WAS MADE

In 1961 the civil defense program of the United States was revitalized and was directed toward providing protection for millions of people against radioactive fallout in the event of a nuclear attack. A long-range program was recommended by the President to identify existing fallout shelters and to provide new ones.

The Office of Civil Defense was created in the Office of the Secretary of Defense to carry out this function. In 1964 responsibility for civil defense was transferred to the Department of the Army. The General Accounting Office (GAO) made this study to evaluate the accomplishments of the civil defense program over the past 10 years.

OBSERVATIONS AND CONCLUSIONS

The Office of Civil Defense has developed a substantial lifesaving capability; however, certain unresolved issues hamper meeting current civil defense objectives. Also a number of important events, such as the acquisition of a nuclear capability by other nations, have occurred in recent years and have significantly affected civil defense planning. (See pp. 5, 16, 33, and 34.)

The principal goal of the current civil defense program--the development of a nationwide fallout shelter system--is complemented by related program elements, such as warning and detection. There are, however, no programs (other than research) aimed at protecting people against chemical or biological weapons or the direct effects of nuclear explosions, such as blast, heat, and shock. (See pp. 15 and 30.)

According to the Department of Defense (DOD), present fallout shelters would save 18 million to 30 million lives which would otherwise be lost in the event of a nuclear attack. Alternative combinations of additional fallout and blast protection, ranging in cost from \$400 million to \$8 billion for fiscal years 1970 to 1975, could save additional millions of lives. (See p. 31.)

Although appropriations for military defense as a whole have increased over recent years, appropriations for civil defense have decreased. (See p. 14.)

OCT. 26, 1971

Insufficient and poorly distributed shelter space

Office of Civil Defense data indicate that, if current programs continue at present levels, up to one half of the population still will lack standard fallout protection in 1975. Furthermore available protection is dispersed unevenly. In major cities 2.5 fallout shelter spaces are available for each person, compared with less than 0.4 of a space for each person in areas outside major cities. (See pp. 19 to 21.)

The Office of Civil Defense has not used information regarding likely targets of an enemy (targeting assumptions) in setting priorities for developing fallout shelters. The Office has followed a policy which generally treats everyplace as being equally vulnerable. GAO believes that, in the light of the limited funding of this program, this is not a realistic approach. (See pp. 28 and 29.)

The Office of Civil Defense lacks the authority and funds to finance or subsidize the construction of shelter spaces. The Office can only identify, license, mark, and stock available spaces. (See pp. 20 and 21.)

Use of best available shelters

The Office of Civil Defense has established a minimum level of protection which must be met if the shelter is to be licensed, marked, and stocked by the Office. (See pp. 25 to 28.)

Where shelters of this level are not available, however, many lives could be saved and injuries could be reduced by use of the best protection available even though it is below the standard. (See pp. 25 to 27.)

The Community Shelter Planning program encourages the use of protected space under the minimum standards, but these shelters normally are not licensed, stocked, or marked by the Office of Civil Defense. (See pp. 26 and 27.)

RECOMMENDATIONS OR SUGGESTIONS

- ✓ In developing additional fallout shelter protection, the Secretary of Defense should set priorities on the basis of targeting assumptions and the best available predictions of risk. These priorities would help ensure that the limited financial resources are applied to areas most likely to need additional protection. (See p. 29.)
- The Office of Civil Defense recognizes the desirability of marking and stocking the best available shelters, regardless of protection rating, but it does not have the financial resources to do the job. GAO believes that, pending an overall assessment of area priorities in undertaking protective measures, the Office of Civil Defense should stock the best available shelters regardless of protection rating. The question of financial resources obviously must be determined within the overall availabilities of funds for DOD.

GAO recommends that the Secretary of Defense (1) provide additional justification to the Congress, concerning the part which civil defense plays in the U.S. overall national security posture and (2) give consideration to whether higher priority should be given to marking and stocking good shelter spaces already identified, in view of the relatively low per capita cost of protection which these shelters provide. (See p. 29.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

DOD stated that it was aware of the need to reevaluate the civil defense program. Broad policy decisions are expected to be made on the basis of current administration studies. (See ch. 7.)

The Office of Civil Defense hopes to extend its efforts for seeking the cooperation of Government departments involved in providing financial assistance in construction programs for facilities, such as urban renewal and housing agency projects, which have the potential of providing vast quantities of fallout shelter space. (See pp. 21 and 22.)

The Office of Civil Defense defended the use of the current fallout protection standard as a future planning objective, but it stated that the best available concept of shelter use was being applied in its current operational planning. (See pp. 27 and 28.)

MATTER FOR CONSIDERATION BY THE CONGRESS

In view of the issues concerning (1) the imbalance of fallout protection, (2) the potential for expanding fallout protection by using best available space, and (3) the limited progress of the civil defense program in meeting its objectives, as dealt with in this report, and in view of two special studies recently made by the administration pertaining to civil defense, appropriate committees of the Congress may wish to review the reports on these studies for use in any consideration of civil defense requirements. (See p. 35.)



C o n t e n t s

	<u>Page</u>
DIGEST	1
CHAPTER	
1 INTRODUCTION	4
2 RAMIFICATIONS OF THE NUCLEAR AGE	10
Nature of the threat	10
Deterrence to threat	12
Budgetary trends	13
3 PROGRAM ACTIVITIES	15
Fallout shelter program	15
Other program activities	17
Warning and detection	17
Emergency operations	17
Financial assistance to the States and local governments	18
Research and development	18
4 IMBALANCED DISTRIBUTION AND SHORTAGE OF EXISTING FALLOUT SHELTERS	19
Agency comments	21
5 POTENTIAL FOR INCREASING FALLOUT PROTECTION	24
Agency comments and our evaluation	27
Recommendation to the Secretary of Defense	29
6 DEFENSE STUDIES OF ALTERNATIVE TYPES OF CIVILIAN PROTECTION	30
7 BROAD POLICY DECISIONS ON CIVIL DEFENSE NEEDED	33
Agency comments	35
Matter for consideration by the Congress	35
8 SCOPE OF REVIEW	36

APPENDIX

		<u>Page</u>
I	Effects of modern weapons	39
II	The national plan for emergency preparedness	47
III	Letter dated February 17, 1971, from Director of Office of Emergency Preparedness	49
IV	Letter dated March 5, 1971, from Principal Deputy Assistant Secretary of Defense (Systems Analysis) and attachment from Office of Civil Defense	50

ABBREVIATIONS

DOD	Department of Defense
GAO	General Accounting Office
OCD	Office of Civil Defense
OEP	Office of Emergency Preparedness
PF	Protection factor

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CHAPTER 1

INTRODUCTION

In 1951 the Congress enacted the Federal Civil Defense Act (64 Stat. 1245-1257, as amended; 50 U.S.C. App. 2251-2297) authorizing a program to minimize the effects of an attack on the United States. The current civil defense program--a joint Federal, State, and local effort--is based on this act and is designed primarily to protect the population from the disabling and lethal effects of radioactive fallout from a nuclear attack through a nationwide fallout shelter system of existing buildings and new construction. It provides for supporting activities, such as public warning, radiation detection and monitoring, and development of emergency operating capabilities of State and local governments for related training programs.

The beginning of modern civil defense in the United States dates back to World War I when the Secretary of War was made responsible for civil defense. Shortly after 1939 the civil defense machinery was reestablished and functioned until President Truman abolished it in 1945. It was becoming clear even then, however, that the problems of civil defense would assume an entirely new dimension with the possibility of atomic warfare.

A number of studies and reports dealing with a proposed civil defense organization were made. One of these, the 1948 Hopley Report, recommended that an Office of Civil Defense be established directly under the President or the Secretary of Defense. Some objections were raised within the Department of Defense, however, and the recommendation was not adopted. In 1949 the President assigned the civil defense function to the National Security Resources Board but, in a memorandum to the Board, limited its activities to "peacetime planning and preparation for civil defense in the event of war, rather than operation of a full-scale civil defense program."

After the first Soviet Union atomic detonation in 1949, the Board proposed that a Federal Civil Defense Administration be established directly under the President. A plan submitted to the President in September 1950 included a

policy to provide blast shelters in likely target areas. The President immediately requested congressional action on the plan. The Federal Civil Defense Administration was created by Executive Order No. 10186 in December 1950, followed by the Federal Civil Defense Act of 1950 which was signed into law on January 12, 1951.

Funds were requested for large-scale blast shelter surveys and for modification of existing structures to provide blast protection. These measures were proposed at a time when the fallout threat was not a matter of general public knowledge and when the general concept of shelter was protection from the immediate effects of atomic blasts--blast, heat, and shock. The funds appropriated for civil defense in the first 3 years were:

<u>Fiscal year</u>	<u>Amount</u> <u>(000,000 omitted)</u>
1951	\$32
1952	75
1953	43

Following the Soviet Union detonation of a thermonuclear device and the recognition of the enormous destructive potential of the downwind fallout hazard of the newer weapons, blast shelters and evacuation were deemphasized and fallout shelters assumed the major role as the most feasible life-saving protection against nuclear attack.

The steady growth in the destructiveness of weapons, improvements in the means of their delivery, and aggressive actions of a well-armed and hostile Communist bloc forced a reevaluation of the security position of the United States. America's leaders concluded that civil defense was an essential part of the strategic defense structure of the United States.

During the 10 years after the enactment of the Federal Civil Defense Act of 1950, the rapidity and magnitude of changes in the world situation complicated attempts to define the potential and the limitations of civil defense, the manner in which the program should be conducted, and the position of civil defense in a structure of national

defense. In spite of changing views, basic research was conducted, civil defense offices were established, and initial plans were made.

From 1951 to 1958, under the Federal Civil Defense Administration, a number of programs were initiated, including an attack warning system, stockpiling of medical and other civil defense supplies and equipment, civil defense exercises, and research programs. No means was developed by the agency during these years to protect the population from atomic attack, however, and little provision was made for caring for survivors.

In 1958 the Federal Civil Defense Administration and the Office of Defense Mobilization were merged to form the Office of Civil and Defense Mobilization. From the time of its establishment, a major activity of the agency was preparing The National Plan for Civil Defense and Defense Mobilization which set forth the basic policies, responsibilities, and procedures as a foundation for operational plans.

Early in 1961 it became apparent that careful scrutiny of the program for civil defense had to be made. There was general feeling that past efforts, handicapped as they were by insufficient political and financial support, had not produced the type of program that could provide security against thermonuclear weapons. On May 25, 1961, President Kennedy delivered a message to the Congress on urgent national needs, in which he announced the initiation of a long-range program to protect the public from fallout. The President stated:

"This Administration has been looking hard at exactly what civil defense can and cannot do. It cannot be obtained cheaply. It cannot give an assurance of blast protection that will be proof against surprise attack or guaranteed against obsolescence or destruction. And it cannot deter a nuclear attack.

"We will deter an enemy from making a nuclear attack only if our retaliatory power is so strong and so invulnerable that he knows he would be destroyed by our response. If we have that

strength, civil defense is not needed to deter an attack. If we should ever lack it, civil defense would not be an adequate substitute."

The President stated further that the aforementioned deterrent concept assumed rational calculations and that *there still remained the possibility of an irrational attack, a miscalculation, an accidental war, or a war of escalation which could not be either foreseen or deterred.* He also said:

"It is on this basis that civil defense can be readily justifiable - as insurance for the civilian population in case of an enemy miscalculation. It is insurance we trust will never be needed - but insurance which we could never forgive ourselves for foregoing in the event of catastrophe."

The President concluded by recommending a "nationwide long-range program of identifying present fallout shelter capacity and providing shelter in new and existing structures."

By Executive Order No. 10952, dated July 20, 1961, as amended, he divided the existing Office of Civil and Defense Mobilization into two organizations: the Office of Emergency Planning¹ which was to function as part of the Executive Office in advising and assisting the President in determining policy for all nonmilitary emergency preparedness, including civil defense; and the Office of Civil Defense (OCD) to function under the Secretary of Defense in overseeing the Nation's civil defense program. The responsibility for carrying out the fallout shelter program was among the program operations assigned to the Secretary of Defense.

OCD originally was headed by an Assistant Secretary of Defense, but in March 1964 its functions and responsibilities were transferred to the Secretary of the Army who established OCD within his office at the Pentagon and delegated its functions to a Director of the Office of Civil Defense. Although OCD is part of DOD, the emphasis, as directed by President Kennedy in 1961, is on civilian management and

¹Name subsequently changed to Office of Emergency Preparedness (OEP).

control. OCD functions through eight regional offices strategically located throughout the continental United States.

The primary objective of the civil defense program is to plan and implement *reasonable measures* which will *maximize lifesaving* consistent with the *normal pattern* of American society. DOD studies indicate that a *fallout shelter system* best meets this objective. As it has evolved, the civil defense program comprises the following program operations.

1. Fallout shelter.
2. Warning and emergency operations.
3. Supporting activities needed to successfully execute program elements.

Some type of financial assistance to State and local governments is available, either directly or indirectly, in support of practically every element of the civil defense program.

To attain its program objectives, OCD works closely with State and local governments to develop their capability for taking effective action in time of emergency. This implements the joint responsibility between the Federal, State, and local governments, directed by the Federal Civil Defense Act of 1950, as amended.

Also OCD coordinates its functions with OEP and with many other Federal agencies having emergency responsibilities. The concept of civil defense is that the normal forces of Federal, State, and local governments will be organized so that, with supplementary forces as required, they will be able to meet the effects of a nuclear attack.

Federal funds appropriated for civil defense programs from 1951 through 1970 totaled about \$1.7 billion. There has been a downward trend in proposed budgets and actual appropriations during the past several years. For example, \$358 million was requested in fiscal year 1965 (\$105.2 million appropriated); however, only \$76.6 million was requested in fiscal year 1970 (\$70.6 million appropriated).

Budget history data during fiscal years 1962 through 1970 are shown in the following table.

Office of Civil Defense Budget History

<u>Year</u>	<u>OSD-BOB budget (note a)</u>	<u>Presidential budget</u>	<u>Recommended in House bill</u>	<u>Recommended in Senate bill</u>	<u>Amount</u>	<u>Appropriation</u>	
						<u>Percent of OSD-BOB budget</u>	<u>Percent of President's budget</u>
(000 omitted)							
1962	\$ -	\$ 207,600 ^b	\$207,600 ^b	\$ 207,600 ^b	\$207,600 ^b		100.0
1963	754,400	756,900	75,000	215,000	128,000	17.0	17.0
1964	689,400	346,900	87,800	135,338	111,569	16.2	31.1
1965	559,000	358,000	89,200	154,200	105,200	18.8	29.4
1966	371,850	193,900	89,190	124,370	106,870	28.7	55.1
1967	192,029	133,400	102,100	102,100	102,100	53.2	76.5
1968	163,400	111,000	86,100	91,100	86,100	52.7	77.5
1969	159,700	76,800	58,040	63,640	60,540	37.9	78.8
1970	85,656	76,608	65,508	73,808	70,558	82.4	92.1
Total	\$2,975,435 ^c	\$2,261,108	\$860,538	\$1,167,156	\$978,537		

^a OSD--Office of the Secretary of Defense.
BOB--Bureau of the Budget (now the Office of Management and Budget).

^b Does not include \$49.6 million transferred from former Office of Civil and Defense Mobilization.

^c 8 years only.

CHAPTER 2

RAMIFICATIONS OF THE NUCLEAR AGE

The new dimension of destruction--nuclear warfare--which burst upon the world in 1945 has grown more imposing through the years, but the tremendous power and multiple effects of nuclear weapons have not rendered the cause of survival hopeless. Even though a full-scale nuclear attack would cause many casualties, effective protection against some of the effects of nuclear attack is available.

Although a number of original civil-defense-recommended programs, such as duck and cover, evacuation, and do-it-yourself home shelters, no longer are given much emphasis, knowledge and experience gained from them have been used in evolving the present program--basically a nationwide system of fallout shelters.

NATURE OF THE THREAT

The threat of a nuclear attack on the United States under a condition of general war is regarded by OEP as less likely than periods of limited war, possibly involving the use of U.S. military forces on foreign soil. General war represents the only contingency which would significantly threaten national survival.

Measures planned for a war-related emergency generally are limited to protection against *nuclear attack*. Civil defense planning accepts the possibility of a massive nuclear attack on the United States, using ballistic missiles as the principal means of delivery.

The threat to the United States, posed by chemical and biological agents, is considered by DOD to be less significant than the nuclear threat, although chemical agents are effective against tactical targets of limited areas and although biological agents could be used against U.S. population centers. *Currently there are no civil defense programs, other than research, to protect people from the effects of attack with chemical or biological weapons.*

The Nation's general planning assumptions regarding the nature of the threat are contained in the "National Plan for Emergency Preparedness" published by OEP in 1964. (See app. II.) These assumptions include the following items.

1. Ballistic missiles will be relied upon increasingly for delivery of nuclear weapons.
2. No nation has the capability of destroying all rewarding targets in the United States, although any target can be destroyed if the enemy expends sufficient weapons on it.
3. Military command and control centers, centers of government, nuclear retaliatory capability, and concentrations of industry and populations would be likely principal targets. Initial priority would be given to nuclear retaliatory capability.
4. It is impossible to predict with assurance an enemy's specific attack objectives.
5. Tactical warning of an intercontinental ballistic missile attack likely would not exceed 15 minutes for initial targets. Also it is unlikely that strategic warning (indications of a possible attack before it is launched) ever will be so definite as to warrant taking all protective measures for civil defense.

OEP periodically provides Federal agencies having civil defense responsibilities with updated planning assumptions based on specific analyses of strategic situations, in addition to the general planning assumptions contained in the 1964 National Plan.

Civil defense is based, to a large degree, on various assumptions, possibilities, and probabilities. Civil defense documents indicate that the nature of the assumed threat is primarily from nuclear weapons and the potential radiation from these weapons, though the specific nature of a nuclear attack on the United States, the weight of such an attack, the reliability of enemy delivery systems, and specific targets are not subject to precise prediction.

Although the direct effects of nuclear weapons--blast, heat, and shock--are recognized as major elements of the threat, *the civil defense program includes no specific activity to mitigate them.* According to OCD, however, recent research has indicated that some steps--such as direct-effects surveys of existing structures, ventilation improvement of existing below-ground space, and blast protection in new construction--would be useful, provided that the necessary funds were made available. A discussion of the effects of nuclear weapons is given in appendix I.

The ability to intercept a nuclear attack began to diminish and thus the nuclear threat increased, when the delivery systems of nations began to become highly developed and when the speed of delivery increased greatly to the about 10,000-miles-an-hour rate of today's ballistic missiles.

The destructive power of modern weapons is phenomenal. Today's nuclear weapons vary widely in size and yield, but a 20-megaton weapon is 1,000 times as powerful as the Hiroshima bomb. The zone of destructiveness of the larger weapons does not, however, increase in the same ratio as the size of the weapons. For example, the estimated zone of complete destruction for a 1-megaton weapon is 11 square miles but is only about 50 square miles for a 10-megaton weapon.

DETERRENCE TO THREAT

To minimize the possibility of aggression by a hostile nuclear power, the United States has followed a general policy of deterrence intended to make a nuclear attack on our country unprofitable to a potential enemy.

The size and character of weapons systems to maintain this deterrent strength is a subject of continuing debate, since the threat is changing continually and since technology rapidly extends frontiers for both offense and defense. A more fundamental problem, according to DOD, is the relative weights which should be given to assured-destruction and damage-limiting objectives of the deterrence policy in planning our strategic forces.

Assured destruction is the ability to inflict at all times, and under all foreseeable conditions, an unacceptable degree of damage upon an aggressor--even after absorbing a surprise attack. This is the primary emphasis of the U.S. military program. Damage limiting is the ability to reduce the potential damage of a nuclear attack on the United States through the use of both active and positive measures. The anti-ballistic-missile system and civil defense programs are damage-limiting measures.

DOD January 1969 program justifications conclude that the U.S. primary deterrent is the U.S. assured-destruction capability, although damage-limiting measures could contribute to the deterrent if they could be made truly effective by reducing damage to a nominal level even after the opponent responded by increasing his offensive forces. These justifications conclude also that:

"*** on the basis of our present knowledge of military technology, we still see no practical way in which to do this [taking damage-limiting measures] against the kind of attack the Soviets could potentially mount in the 1970's. Accordingly, our best alternative is to continue to base our policy of deterrence on our Assured Destruction capability."

BUDGETARY TRENDS

Within DOD, civil defense competes for funds with active defense and offense weapons systems. The budget for civil defense for fiscal year 1970 represents less than one thousandth of the total DOD budget. The trend in the relationships for fiscal years 1962 through 1970 follows.

Appropriations approved

<u>Fiscal</u> <u>year</u>	<u>Civil</u> <u>defense</u>	<u>DOD</u>	<u>Column 2 as</u> <u>percentage</u> <u>of column 3</u>
	(000,000 omitted)		
1962	\$ 257	\$ 46,495	0.55
1963	128	48,350	.26
1964	112	48,223	.23
1965	105	47,682	.22
1966	107	58,858	.18
1967	102	70,230	.14
1968	86	74,152	.12
1969	61	74,402	.08
1970	<u>71</u>	<u>72,667</u>	.10
Total	<u>\$1,029</u>	<u>\$541,059</u>	.19

DOD, in replying to our draft report (see app. IV), acknowledged the shift in budget emphasis in recent years. According to the Principal Deputy Assistant Secretary of Defense (Systems Analysis), the shift has not resulted from a reduction in civil defense priority or emphasis but rather has been caused by two main factors: (1) the need, since the mid-1960's, for tighter fiscal constraints on all DOD's non-Southeast Asia programs and (2) the tendency in the executive branch to limit budget requests for civil defense to progressively lower levels as a consequence of continued funding reductions during the 9-year period shown above.

Administration policy consistently has emphasized the complementary relationship between active and passive defense measures, but, as indicated, civil defense appropriations have declined steadily over the years in both dollars and the percentage of the total appropriations for defense. In practice civil defense does not seem to be regarded as a primary element of national defense.

CHAPTER 3

PROGRAM ACTIVITIES

FALLOUT SHELTER PROGRAM

The principal goal of today's civil defense program is the development of a nationwide fallout shelter system to protect the total population, wherever it may be, from radioactive fallout. Under this program potential public fallout shelter facilities are identified in existing buildings and in special facilities (mines, caves, tunnels) through surveys conducted by the U.S. Army Corps of Engineers and the Naval Facilities Engineering Command. These surveys determine the fallout protection level, known as the protection factor (PF),¹ provided by each facility and the number of persons the facility can accommodate.

Facilities which meet specified criteria to a level equal to PF 40 or better and which have sufficient space for 50 or more persons are considered as eligible public fallout shelters and are licensed by means of a signed agreement between the Federal Government, the local government, and the owner of the facility. These facilities then are marked and stocked as needed with OCD-furnished food, water storage containers, medical and sanitation supplies, and radiation detection and measuring equipment.

The initial fallout shelter surveys were concerned only with identification of all shelter spaces which met the specified criteria. There was no attempt to match population with shelters. Therefore, in 1966, OCD developed a Community Shelter Planning program, including projects to ensure effective use of the fallout shelters identified in the survey.

¹The relationship between the amount of fallout gamma radiation that would be received by a person inside and protected compared with the amount he would receive if he were outside and unprotected, e.g., persons in a PF 40 shelter would receive one fortieth as much radiation as unsheltered persons.

This program, which is the foundation of local emergency readiness, matches population areas with available shelter space and provides for public dissemination of detailed instructions for each person on where to go and what to do. To avoid overloading and underloading, available shelters and population statistics are identified on maps and persons living and working in particular areas are allotted shelter spaces. The program also defines the unfilled needs for shelter in a community and identifies the best available shelters.

Following are OCD statistics on fallout shelter surveys and on Community Shelter Planning projects as of June 30, 1970.

<u>Fallout shelter surveys</u>	<u>Spaces (note a) (000 omitted)</u>
National fallout shelter survey:	
Identified	194,774
Licensed	127,812
Marked	107,501
Stocked	103,414
Smaller structures survey (note b)	2,550
Home fallout protection survey (note c):	
PF 40 or better	1,817
PF 20 to PF 39	28,021
Community Shelter Planning projects:	
Funded projects started	262
Nonfunded projects started	1,424

^aSpaces allow 10 square feet for each person and, except for the last-line item, provide PF 40 or better.

^bBuildings, other than one-, two-, and three-family houses, having shelter space for 10 to 49 persons.

^cIn 26 States and the District of Columbia.

As shown by the above survey data, fallout shelter space providing PF 40 or better has been located for about 195 million people, but not all of these shelter spaces have been developed. Only 66 percent have been licensed;

55 percent have been marked with identifying signs; and about 53 percent have been stocked with food, water, and other survival items.

OTHER PROGRAM ACTIVITIES

Although the national fallout shelter system is the heart of civil defense planning in the United States, it does not stand alone. Complementary program elements fall into four categories: (1) warning and detection, (2) emergency operations, (3) financial assistance to the States, and (4) research and development.

Warning and detection

The main program in this category is the radiological monitoring and reporting program which is designed to provide accurate and timely data on the intensity and extent of radioactivity following a nuclear attack. OCD buys, distributes, and maintains the instrumentation to meet this objective. As of June 30, 1970, 71,042 radiological monitoring stations had been established and 111,404 shelters had been equipped with radiological detection and monitoring kits.

Public warning of an attack is initiated through the National Warning System. The system sends attack-warning information from OCD warning centers located in North American Air Defense Command installations to over 1,500 secondary warning points in key Federal locations, principal cities, and State capitals. From these warning points, news of possible attack can be relayed via local warning systems to the public by means of horns, sirens, whistles, or other locally devised means.

The fiscal year 1971 budget estimate for the warning and detection program was about \$3.8 million.

Emergency operations

There are eight programs under the category of emergency operations, including training and education, damage assessment, and emergency information. These programs are designed (1) to inform and train citizens before a disaster

so that they will know what to do in case of emergency, (2) to provide capabilities for assessment of damage--potential damage before an attack and real damage after an attack--and (3) to develop and provide emergency information to meet public needs during an emergency. For these programs \$10.6 million was requested for fiscal year 1971.

Financial assistance to the States and local governments

For fiscal year 1971, \$26 million was requested for a program of providing financial assistance to the States and local governments. This program provides funds for matching expenditures of the States and local governments on a dollar-for-dollar basis for three grant-in-aid programs--personnel and administrative expenses of State and local civil defense activities; emergency operating centers; and survival supplies, equipment, and training.

Research and development

The goal of the program of research and development is to advance technology of ongoing and potential future civil defense programs and operations, to maximize effectiveness and reliability and to reduce costs where possible. The fiscal year 1971 budget estimate for this program was \$3.5 million.

Selected OCD statistics on the status and accomplishments of the complementary program elements as of June 30, 1970, follow.

	<u>Number</u>
Emergency operating centers:	
Funded with Federal matching funds	1,039
Nonfunded--100-percent State and local funds	2,571
Warning points:	
National warning points	983
State and local extensions funded with matching funds	281
Backup installations funded with Federal funds	490
Radiological monitoring stations:	
Fixed monitoring points	71,042
Shelter facilities-equipped	111,404
People trained:	
Under the civil defense education program	3,203,134
Under the medical self-help program	12,554,558
Under the university extension program	332,273
Architect-engineer fallout shelter analysts	19,843
Military installations' radiological defense-monitoring personnel	18,484

CHAPTER 4

IMBALANCED DISTRIBUTION AND

SHORTAGE OF EXISTING FALLOUT SHELTERS

The identification of fallout shelters by OCD under its fallout shelter survey program has, in our opinion, disclosed an imbalance of existing protection between major cities and other population areas and a shortage of shelters in meeting its goal of providing protection for all persons.

OCD statistics show that on the average 2.5⁽¹⁾ fallout shelter spaces are available for each person in major cities but that less than 0.4⁽¹⁾ of a space is available for each person in noncity areas and cities with populations under 25,000. Further, most of the protection in the major cities exists in the commercial-industrial cores (the central business districts) rather than in residential areas since fallout protection is found mainly in large buildings. The imbalance is shown also by the availability of shelters stocked with survival supplies and equipment--shelters are stocked for 58 percent of the population of major cities but for only 14 percent of the population of other areas.

Considering the possibility of enemy targeting, the central urban areas containing the majority of fallout shelters may be highly vulnerable to destruction from blast, heat, shock, initial radiation, and other primary effects of a nuclear attack. The possible attack level could be many hundreds of times greater than the explosive power of the atomic bomb dropped on Hiroshima. The National Plan for Emergency Preparedness published in 1964 by OEP assumes that large populations centers likely will be important enemy targets.

The imbalance in distribution of existing fallout protection between major cities and other areas appears to be a result of OCD's program of identifying and developing shelter spaces in only existing facilities or in new construction being built by others.

¹These ratios are based on the 1960 census and 1968 shelter data.

OCD does not have the authority to construct or to pay for the construction of special-purpose public fallout shelters in any location, including areas with a deficit of shelter spaces. The shelter program is geared to the identification, licensing, marking, and stocking of shelters in buildings and other facilities over which OCD has no direct construction control or influence. In other words, *OCD's program is not aimed at adding significantly to the Nation's shelter capacity* since it does not provide for constructing, or financing the construction of, shelter space. OCD merely identifies what becomes available through normal construction.

Thus there is no current Federal program to provide direct financial assistance to underprotected suburban and rural areas to increase their protection from radioactive fallout, even though OCD recognizes that the predominant danger outside the central core areas of large cities will be from fallout. Further *the existing fallout protection gap between major cities and other areas probably will continue to widen* if present practices continue, since heavy construction which provides adequate safety from radiation will be located predominantly in commercial-industrial core areas of cities.

OCD has established certain programs to stimulate more shelter construction in underprotected areas and to increase the amount of protection to the Nation in general. One of these is the OCD Shelter Development Program under which OCD encourages architects and consulting engineers to include shelter areas in their building designs to increase the national shelter inventory. Professional courses in fallout shelter analyses are offered to architects and engineers, and OCD data show that by April 1969 more than 17,500 students had completed these courses and had passed a qualifying examination.

OCD also has initiated a program (Direct Mail Shelter Development) whereby new projects and their architects are identified through construction reports. Architects and owners then are contacted and asked to incorporate shelter spaces in their projects. Also, a university advisory service is available to give architects advice on radiation protection design.

Some measures which OCD has proposed, but has not undertaken, are Federal construction of public fallout shelters, Federal funding of portable ventilation kits to increase the shelter capacity of below-ground areas in existing buildings, and Federal subsidies to encourage building owners to provide fallout shelter space in new construction in underprotected communities.

The basis for the last proposal is OCD data which indicate that, if current programs continue at present levels, up to one half of the population in 1975 still will lack standard (PF 40 or better) fallout shelter protection under existing time and distance movement criteria.

According to OCD this deficit, or unfilled requirement for standard shelters, is not likely to be changed appreciably unless new means are instituted to increase the number of fallout shelters incorporated into new buildings.

To test how shelter inclusion can be stimulated in areas lacking sufficient standard shelters, OCD has proposed that small Federal payments be made to building owners who include shelters in new construction projects. The test would determine program acceptance and effectiveness in terms of spaces added under various payment methods. The proposed payment formulas would provide the building owner a subsidy of a specified percentage of total costs or a specified amount for each added shelter space, but the subsidy would not exceed the actual additional cost of construction. For fiscal year 1971 OCD envisioned payments of \$10 for each added shelter space.

OCD requested \$2.5 million and \$1.5 million for fiscal years 1970 and 1971, respectively, to initiate the above experimental shelter subsidy program, but the funds were not appropriated.

AGENCY COMMENTS

In December 1970 we issued a draft report to DOD on our observations on the imbalance of fallout protection between urban and nonurban areas and on the shortage of fallout protection for the Nation. We suggested that, since it appeared that a shortage of standard protection would continue to

exist under OCD's current program of developing fallout shelters, early consideration be given to actions to increase the number of available shelter spaces, especially in areas currently underprotected.

Specifically, we proposed that the Secretary of Defense seek, in addition to the actions already under way or proposed for OCD, the cooperation of governmental agencies involved in programs which can provide vast quantities of fallout shelter spaces as part of the construction of facilities, such as mass transit (subways), urban renewal, and housing departments and agencies.

In its reply to our draft report (see app. IV), OCD advised us that it concurred with our proposal to seek the cooperation of Federal agencies to increase the amount of protection and stated that it was, in fact, then carrying it out. OCD stated that Executive Order No. 11490 dated October 28, 1969, which assigns emergency preparedness functions to various Federal agencies had been helpful in gaining entry of OCD employees into Federal agencies to discuss shelter.

Prior to promulgation of Executive Order No. 11490, there was no Government document requiring consideration of fallout shelter in Federal financial assistance construction programs. Since issuance of the Executive order, various departments including--the Departments of Health, Education, and Welfare and Housing and Urban Development--have encouraged incorporation of shelters in their financially aided projects. OCD pointed out the significance of this construction area because in fiscal year 1971 it involved about \$7 billion of Federal grant funds.

As an example of the results of increased coordination during the past year, OCD cited one Government agency which previously refused to have anything to do with shelter design but which now includes fallout protection in the design of many of its new facilities. OCD also stated that it hoped that this cooperation could be extended to other agencies involved in programs to give financial aid for construction.

Concerning our observations on the imbalance of protection, however, OCD acknowledged the current substantial lack

of shelter spaces but indicated that, generally, it had been unsuccessful in obtaining funds and the authority to take alternate actions to increase the number of shelter spaces. It stated that, although the national fallout shelter policy was adopted in 1961, only the first phase of the policy had been implemented--identification of fallout shelters in existing structures. Lack of legislative authority for shelter incentive payments and restrictive budgets have not permitted OCD to increase the number of shelters where existing structures cannot meet the need. OCD indicated that funds had not been approved for ventilation devices which could provide a significant increase in below-ground shelter capacity.

Our review indicates that the Nation lacks, and under current programs will continue to lack, a sufficient number of properly dispersed, adequately equipped fallout shelters in homes, schools, and other buildings and facilities to accommodate the population in the event of nuclear attack.

CHAPTER 5

POTENTIAL FOR INCREASING FALLOUT PROTECTION

We believe that, as a potential means of significantly increasing the number and the adequacy of marked and stocked fallout shelter spaces available to the public--until such time as more shelters meeting Federal minimum standards become available (see ch. 4)--consideration should be given to (1) the desirability of marking and stocking *the best available shelters* in an area and (2) emphasizing the development of fallout shelters in those geographic areas considered to be *most likely at risk* from fallout.

The Federal minimum standard considered necessary for the protection of lives has been lowered as a result of continued research into the required radiation shielding and of the limited funds available to provide support for a national fallout shelter construction program for high PFs. The Federal minimum standard during 1955-57 was PF 5,000 and subsequently was lowered to PF 1,000 in 1959, PF 100 in 1960, and PF 40 in 1962.⁽¹⁾ The current standard of PF 40 resulted from a Presidential Science Advisory Committee, an advisory panel on civil defense, which reported on July 16, 1962, that:

"*** a lower figure, say PF 50 [the minimum standard at that time was PF 100], would make a much larger number of spaces available without greatly decreasing the lifesaving potential under many kinds of attack."

¹Examples of each PF:

- PF 5,000--underground shelters (3 feet of earth cover or equivalent) and subbasements of multistory buildings.
- PF 1,000--basements, without exposed walls, of multistory masonry buildings.
- PF 100--central areas of basements, with partially exposed walls, in multistory buildings.
- PF 40--basements, without exposed walls, of small two- and three-story buildings.

Since shelter surveys were reporting in the PF ranges of 20 to 39, 40 to 69, etc., PF 40 was chosen as the closest approximation to PF 50 suggested by the advisory panel. OCD finances the development--licensing, marking, and stocking--of public shelters if the shelters provide PF 40 or better.

An OCD document states that moderate levels of protection can provide significant reductions in fallout fatalities, and this statement is supported by data based on radiation dose situations computed for a large hypothetical attack on military and urban targets in the United States. The information indicates that, of those surviving the direct effects of the attack, 46 percent would survive the fallout hazard without shelters and 97 percent would survive in PF-40 shelters.

Although shelters providing less than PF 40 normally are not licensed, marked, or stocked by OCD as part of the national shelter inventory, OCD data indicates that these shelters, too, could provide significant lifesaving protection. For example, the document which showed that 97 percent of the survivors of the direct or initial effects of a hypothetical attack would remain alive in PF-40 shelters also indicated that 93 percent would survive in PF-20 shelters and 90 percent would survive in PF-15 shelters.

OCD acknowledges that, where shelters of PF 40 or better are not available, many lives can be saved and injuries can be reduced by the use of the best protection available. According to OCD, the community shelter planning process provides for the use, where necessary, of protected space having less than PF 40. These lesser protected shelters, however, normally are not licensed, marked, or stocked by OCD.

Although OCD has stated that the best available shelter, regardless of PF, should be provided for everyone, we believe that adherence to the Federal fallout standard of PF 40 for financing purposes has prevented this concept from being applied effectively in practice. OCD makes no distinction as to the best available shelter if there is an excess of shelter spaces above PF 40. Therefore, although a shelter meets the Federal standard of PF 40, people may

be directed to go to a less than best available shelter, with the attendant increased risk of radiation damage.

The nature of construction in the urban core areas inherently provides a greater degree of radiation shielding than that in residential areas. Also the threat appears to be greater in urban areas, but this apparently is not considered in developing a shelter program. We noted that targeting assumptions were relied on in cost-effectiveness studies leading to the adoption of the current fallout shelter program but were not used in implementing the program. Adherence to a fixed minimum PF standard--PF 40--on a nationwide scale gives an all-or-nothing approach to the fallout shelter program.

Some local community civil defense officials, with encouragement from OCD, have included unmarked and unstocked shelters having less than PF 40 on their community shelter planning maps distributed to citizens of the community. In case of a civil defense emergency, citizens are supposed to go to these shelters. *Thus the inconsistent situation exists where OCD limits Federal financing under its shelter identification program to shelters of PF 40 and above but encourages the use, under its Community Shelter Planning program, of unmarked, unstocked shelters below the Federal standard of PF 40.*

We were unable to find OCD estimates on the overall number of additional spaces that could be added to the national fallout shelter inventory if shelters rated at various PFs lower than PF 40 were included. One indication, however, is shown in statistical data from OCD's survey of home fallout protection. The survey, completed in 26 States and the District of Columbia, identified 1.8 million PF-40 or better shelter spaces in homes and 28 million PF-20 to PF-39 shelter spaces in homes. (See table on p. 16 of this report.) Also OCD informed us that subsequent surveys of small structures (excluding one-, two-, or three-family homes) having a 10- to 50-person capacity identified an additional 6.6 million PF-40 or better shelter spaces, 5.8 million PF-20 to PF-39 shelter spaces, and about 4 million PF-10 to PF-19 shelter spaces.

AGENCY COMMENTS AND OUR EVALUATION

In our draft report to OCD, we suggested that the Secretary of Defense either consider lowering the current standard of PF 40 or permit Federal financing of the best available shelters in an underprotected area, regardless of the PF.

In its reply OCD stated that the PF-40 standard is a civil defense planning objective for the future--a goal for ultimate shelter posture to be actively pursued in identifying existing shelter and designing shelter into new construction. OCD believed that the PF-40 standard should be maintained as the goal but stated that the best available concept was being applied in current operational planning in that local communities were provided data by OCD on shelters below PF 40 for use in preparing community shelter planning programs.

OCD stated also that, if funds were available for procurement of shelter supplies, it might be desirable to mark and stock public shelters used in a community shelter plan even though they were less than PF 40. Because of insufficient funds, however, only about half the PF-40 or better shelters are currently stocked, and many of these are not stocked to capacity.

Although we agree that providing fallout protection of PF 40 or better may be a desirable goal to be actively pursued, we believe that limiting Federal financing to public shelters having such protection tends to limit the lifesaving potential of the fallout shelter program. Many rural, suburban, and residential communities are not likely to achieve an adequate sheltering capacity at the PF-40 level or perhaps even the PF-20 level. OCD cannot predict the level of protection that will be required for any given location, but *it appears that substantially more protection can be furnished if facilities which provide the best available fallout protection, even though below the PF-40 level, are identified, licensed, marked, and stocked.*

We believe also that OCD can accomplish more effectively its goal of providing protection to the total population by directing its efforts toward the identification

of the best available shelter sufficient to meet the peak population requirements of each local area within the established time and distance movement criteria. After identification of sufficient shelter space by best available criteria, OCD could, if funds permitted, periodically upgrade protection by substituting better space in new or modified facilities. As new or improved space becomes available, previously identified space having a lower PF can be removed from the inventory, and thus sufficient best available space to meet the peak population requirements of the area will be retained.

OCD stated that additional funds would be required to move the supplies and equipment to the improved space when it became available. Although this is true, it should be recognized that, during the time the best available shelters were in the program, the fallout protection provided would be increased and that this increased availability could be of inestimable value in the event of a nuclear attack during that period. Thus we believe that the potential value of the added protection may outweigh the additional moving costs.

In our draft report we also indicated that, in administering the shelter program, OCD did not appear to recognize or make any assumptions regarding the locations of enemy targeting. Thus every place is treated equally and shelter development is not emphasized in areas of highest risk. OCD replied that, given the decision to limit civil defense measures to a fallout shelter-oriented program, considerations of risk are not germane. Winds may cause fallout to occur anywhere in the United States after a nuclear attack, according to OCD, and cities or industrial areas cannot be totally written off as unsuitable for fallout shelter, because no one can predict exactly which cities or industrial areas will be targeted.

We agree that precise predictions of enemy targets and wind patterns cannot be made, and we also believe that providing all citizens with equally adequate civil defense protection is a desirable goal. *Because of the limited financial and other resources which, according to OCD, have restricted the development of the civil defense program, however, we believe that priorities of effort should be set, on the basis of the best available predictions of risk.*

RECOMMENDATION TO THE SECRETARY OF DEFENSE

We recommend that the Secretary of Defense, in carrying out the civil defense program, establish priorities and stress the development of protection in those areas considered by DOD to be most likely at risk from fallout after a nuclear attack. The use of priorities would also help to ensure that the limited financial resources are applied to areas most in need of additional protection.

We believe that pending an overall assessment of area priorities in undertaking protective measures, OCD should stock the best available shelters regardless of protection rating. The question of financial resources obviously must be determined within the overall availabilities of funds for DOD. We recommend also that the Secretary of Defense (1) provide additional justification to the Congress concerning the part which civil defense plays in the U.S. overall national security posture and (2) give consideration to whether higher priority should be given to marking and stocking good shelter spaces already identified, in view of the relatively low per capita cost of protection which these shelters provide.

CHAPTER 6

DEFENSE STUDIES OF ALTERNATIVE TYPES

OF CIVILIAN PROTECTION

The principal goal of the current civil defense program is the development of a nationwide fallout shelter system to protect people from the hazards of radioactive fallout from a nuclear explosion. Although primary or direct effects of nuclear weapons, such as blast, heat, shock, initial radiation, and other lethal or disabling effects, are recognized by OCD as a major element of the threat, the current civil defense program includes no activities to mitigate these effects by protecting people and property from them. Any protection afforded to persons in target areas against primary weapons' effects would come about by happenstance rather than by design; that is, incidental to taking cover indoors and in shelter. Similarly, there are no active civil defense programs to protect people from effects of chemical or biological weapons. Evacuation as a lifesaving concept, after warning that attack is under way, is no longer considered by OCD as a feasible alternative or supplement to fallout shelters.

Information has been developed, however, by OCD and DOD on the cost and the lifesaving potential of various strategic defense programs. Pertinent portions of this information are presented in the following paragraphs.

DOD studies showed that, in a nuclear attack against a projected U.S. population of 226 million in 1975--with the attack directed against military forces, population centers, and large industrial installations--some 104 million people, or about 46 percent of the population, would die if the United States had an anti-ballistic-missile defense and no civil defense program. Of those killed, about half would die of fatal doses of fallout radiation. The remaining 122 million people would survive both the direct and fallout effects of the nuclear attack. The projection of deaths from the direct effects of such a nuclear attack was considered comparable to the Hiroshima experience. There, with people distributed at random--some out in the open,

relatively unwarned and unprotected--68,000 of the 256,000 population, or about 27 percent, were killed. There was no lethal fallout.

The studies made by OCD calculated the lifesaving effectiveness of various amounts and kinds of shelter, of alternative warning systems, and of different days-of-supply of shelter stocks. They showed that, with the 160 million fallout shelter spaces existing as of January 1, 1969, 18 million to 30 million of the projected 1975 fatalities of 104 million could be saved. Additional shelters identified by continuing the fallout shelter survey from 1969 to 1975 could save another 1 to 5 million lives, depending on whether present warning systems were improved. Alternative combinations of fallout and blast protection could save additional millions of people.

Projections of total costs for alternative civil defense programs for fiscal years 1970-75, according to the OCD studies, range from \$400 million to \$8 billion. These totals include the costs of additional shelter spaces, which range from \$55 million to \$7 billion.

Generally, the greater the number of lives saved by a given civil defense program, the more costly the program for each life saved. For example, OCD estimated that a program of fallout shelters consisting of spaces located by shelter surveys plus spaces added by use of packaged ventilation kits would provide shelter to 68 percent of the population by 1975; would save some 41 million people who otherwise would die; and would cost about \$1 billion, or about \$26 for each life saved.

Another program studied by OCD would provide spaces additional to the first program by subsidizing shelters in new buildings. This would provide shelter for 86 percent of the 1975 population; save 49 million people; and cost about \$2.2 billion, or about \$44 for each life saved. Adding still further spaces to the above programs through specially constructed fallout shelters to provide for the entire 1975 population would save 55 million people at a cost of \$85 for each life saved.

The following table shows pertinent statistics on some of the alternative programs studied by OCD.

	Percent of pop- ulation provided with <u>shelter</u>	Number of <u>deaths</u>	Number of <u>sur- vivors</u>	Lives <u>saved</u>	Esti- mated <u>cost</u>	Cost for each life <u>saved</u>
	—————(millions)—————					
No shelter	-	104	122	-		
Shelters located to Jan. 1, 1969	40	78	148	26	\$ 639	\$ 25
Surveys of existing shelter continued to 1975	54	74	152	30	995	33
Spaces located to 1975 (3 above) plus use of pack- aged ventilation kits	68	63	163	41	1,059	26
Same as 4 plus spaces added by construction sub- sidy payments	86	55	171	49	2,166	44
Same as 5 plus spe- cially constructed fallout shelters	100	49	177	55	4,686	85
Same as 5 plus con- struction subsidy payments for blast protection in 100 largest cities	86	48	178	56	5,684	102

CHAPTER 7

BROAD POLICY DECISIONS ON CIVIL DEFENSE NEEDED

Over the past several years, there have been inquiries by congressional and executive branch officials into the need for redirection of civil defense efforts, but the focus of the program has not changed materially since 1961. The lack of change, despite significant world and national developments affecting civil defense assumptions and planning, indicates to us that reconsideration of civil defense requirements and implementation may be appropriate.

During congressional hearings on civil defense in 1963, Subcommittee No. 3 (Hebert Subcommittee) of the House Committee on Armed Services considered a bill to provide for shelter in Federal structures and to authorize payment toward the construction or modification of approved public shelter space. The bill was actively supported by the Committee and was approved by the House of Representatives. According to OCD, however, the legislation was deferred by the Senate Armed Services Committee on the premise that the need for an expanded fallout shelter program was related to the then-unresolved need for deployment of an anti-ballistic-missile system.

Since the last period of major public and congressional concern for civil defense, around the time of the Cuba missile crisis and the Hebert Subcommittee hearings in 1962 and 1963, a number of developments and events have occurred which have important implications for civil defense assumptions, goals, and planning. Among these are:

- The threat posed by the recently acquired nuclear capability of Communist China and its impending deployment of a delivery system.
- The technological advances in weapons and delivery capabilities in recent years by all nuclear powers.
- The ratification of the nuclear nonproliferation treaty.
- The widening Sino-Soviet rift.

- The Soviet-American strategic arms limitation talks.
- The congressional decision for implementation of an anti-ballistic-missile system.
- The congressional and public attention focused on the country's chemical and biological warfare effort, culminating in the President's decision to halt further production and testing of such agents.
- The launching by Red China of its space satellite in April 1970.

In addition, at least three developments pertaining to the structure and effectiveness of OCD have occurred recently. In May 1969 the President directed OEP to make a study of the civil defense program, with particular emphasis on the status and effectiveness of OCD's fallout shelter program. Information for the study was received from a number of agencies with emergency preparedness functions and from non-Federal groups concerned with civil defense. In June 1971 a report on the results of the study was being prepared for review by the National Security Council. At the beginning of our review, we attempted to obtain information from OEP on the objective and scope of the study, but we were unsuccessful.

OCD is also the subject of a study group formed when the President, in an April 1970 message to the Congress, recommended liberalization of some of the laws pertaining to natural disasters. The President stated that disaster assistance activities of State and local governments often are closely related to their civil defense responsibilities and that the relationship between Federal Government disaster assistance and civil defense activities should be reviewed carefully, with special attention being given to the impact of any suggested change on national security. In June 1971 a report on the study was under review by the Office of Management and Budget.

Additionally, a Special Subcommittee on Civil Defense of the House Armed Services Committee held hearings in October 1970 on a general review of civil defense program developments since 1963. No report has been issued but

additional hearings are scheduled to be held before the end of the current session of the Congress.

A number of issues also have been raised in literature on civil defense and in budget hearings on civil defense appropriations. Among problems cited have been (1) the inability to provide blast protection for those population areas most likely to sustain blast damage and (2) the lack of recognition or assumptions regarding enemy targeting with the result that everyone and everyplace is treated equally in civil defense planning, which we believe is not a realistic approach in the light of limited funding.

AGENCY COMMENTS

In our draft report to DOD, we suggested that there was a need for broad policy decisions on basic civil defense planning. In response *DOD stated that it was acutely aware of the necessity for reevaluation. OCD agreed that such decisions on the future direction of civil defense were needed and, hopefully, expected as a result of the several administration studies being made.*

MATTER FOR CONSIDERATION BY THE CONGRESS

In view of the issues concerning (1) the imbalance of fallout protection, (2) the potential for expanding fallout protection by using best available shelter space, and (3) the limited progress of the civil defense program in meeting its objectives as dealt with in this report, and in view of two special studies recently made by the administration pertaining to civil defense policies, to the shelter program, and to the relationship between natural disaster assistance and civil defense activities, appropriate committees of the Congress may wish to review the reports on these studies for use in any consideration of civil defense requirements.

CHAPTER 8

SCOPE OF REVIEW

Our study of civil defense activities was made to determine the extent of protection available to the people in the event of a nuclear attack on the United States and included a review of the history and current status of civil defense programs conducted at the Federal, State, and local levels.

Our study of the philosophy, policy, and programs of OCD was conducted at the national headquarters in Washington, D.C., and at the Region No. 8 office, at Bothell, Washington. In addition, we discussed and examined documents on national planning guidance for emergency preparedness at OEP in Washington, D.C. We also reviewed civil defense and natural disaster activities at the State of Washington Department of Civil Defense and at several county and city civil defense offices.

We interviewed officials responsible for civil defense activities at the Federal, regional, State, and local levels and reviewed records and publications relating to all aspects of civil defense.

APPENDIXES

EFFECTS OF MODERN WEAPONS

Some knowledge of the effects of nuclear weapons is an aid to understanding the primary objectives of the present civil defense effort.

A nuclear explosion produces four principal kinds of life-endangering forces. Blast, heat, and initial radiation, which occur almost instantaneously at the moment of explosion, have an immediate effect. In addition, there is a delayed effect, residual radiation (more commonly known as radioactive fallout), the severity of which depends largely upon the height at which the explosion occurs. An explosion at or near ground level will produce much more radioactive debris than an explosion at high altitude.

The area of severe destruction resulting from an explosion may vary with the size of the nuclear weapon, with the height of the detonation, and, to some extent, with the terrain and atmospheric conditions.

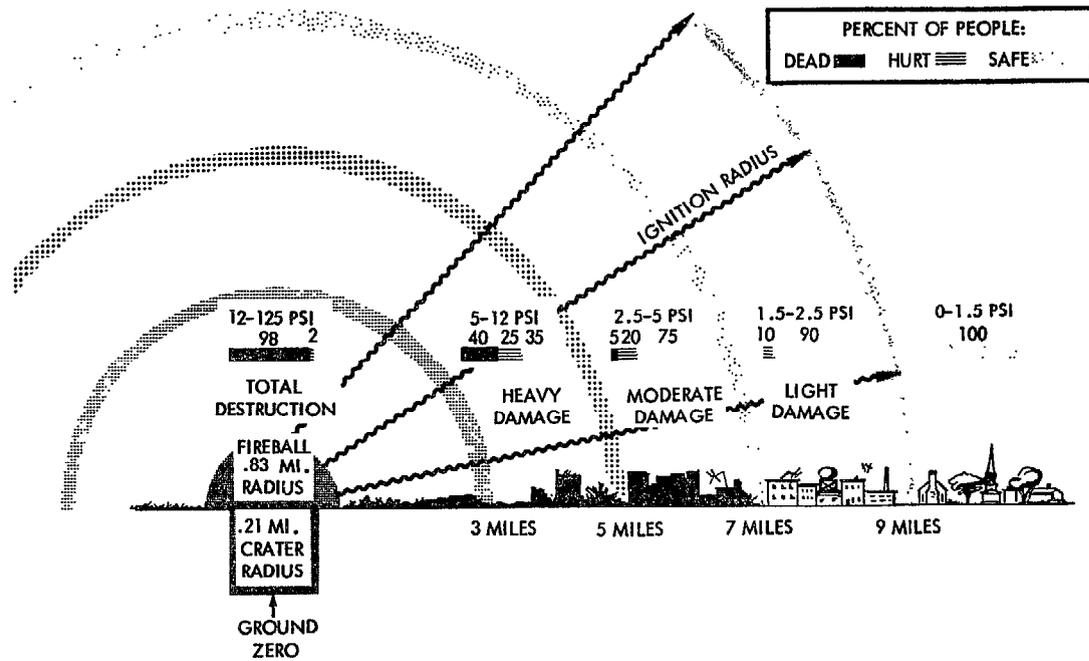
The initial effects of a nuclear explosion are devastating and little can be done to avoid them at close range. These effects, however, are limited geographically. People a few miles from the explosion would be endangered by the blast and heat, but most of these people would survive these initial hazards. DOD illustrations of the blast and heat effects of a 5-megaton and a 20-megaton nuclear explosion are shown in the following charts.

The main danger to the Nation as a whole is the delayed effect of radioactive fallout, which could blanket large areas of the country in an all-out nuclear attack. *Fallout can be just as deadly as the initial effects of the bomb, but a variety of measures can be taken to protect people until time dissipates the danger of radioactivity.*

Facts about fallout

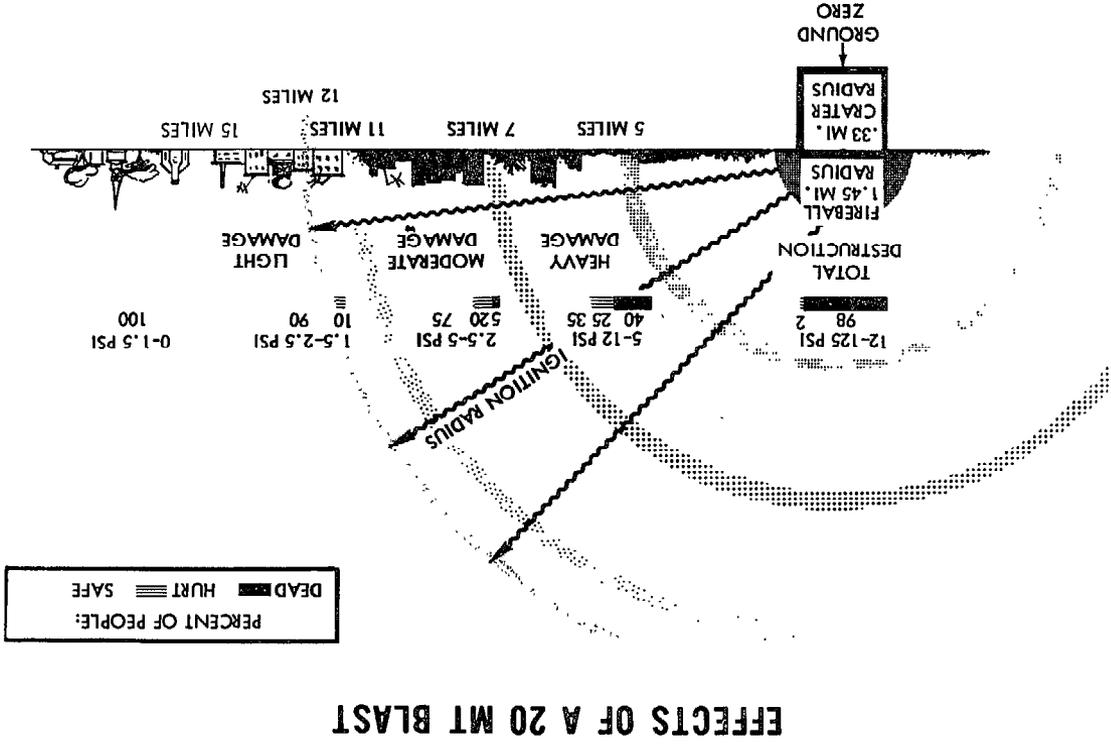
When a nuclear weapon explodes near the ground, great quantities of pulverized earth and other debris are sucked up into the nuclear cloud. There the radioactive gases produced by the explosion condense on and into this debris, producing radioactive fallout particles. Over a period of

EFFECTS OF A 5 MT BLAST



40

If burst is elevated to altitude maximizing reach of blast damage:
 "Moderate Damage" from blast is extended from 7 to 11 miles
 "Ignition Radius" (ignites newspaper) is extended from 9 to 10 miles



If burst is elevated to altitude maximizing reach of blast damage:
 "Moderate Damage" from blast is extended from 11 to 17 miles
 "Ignition Radius" (ignites newspaper) is extended from 12 to 17 miles

APPENDIX I

time, these particles fall back to earth--the larger ones first, the smaller ones later.

The early fallout, which affords the major radiation danger, descends in less than 24 hours. Less dangerous lighter particles will sift down for years at a diminishing rate.

The fallout pattern depends on the type, size, and detonation of the weapon involved and on the meteorological conditions for the first day or so after the blast. In areas where the fallout patterns from two or more weapons overlap, the hazard increases. In a massive nuclear attack on the United States, much of the country could be blanketed by the ensuing fallout. DOD illustrations of what fallout patterns could look like on a spring day and a fall day follow.

Fallout particles emit several types of radiation, but the most dangerous ones are gamma rays. Gamma rays have greater penetration power than other rays. They affect living tissue by damaging the ability of body cells to reproduce. Because the human body is continually replacing damaged and worn-out cells to maintain an efficient level of operation, any hindrance to this replacement process results in lowering body resistance to disease and organic malfunction. Therefore *survival potential is directly related to the amount of radiation to which a person has been subjected.*

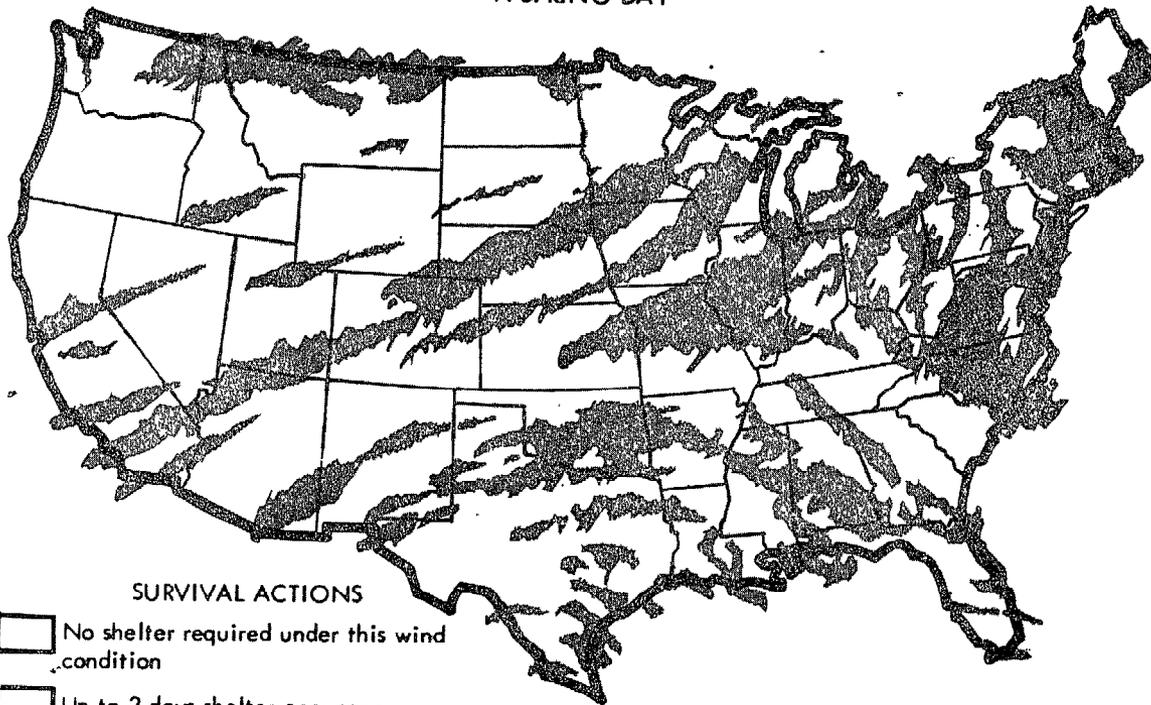
No special clothing can protect people against gamma radiation, and no special drugs or chemicals can prevent large doses of radiation from causing damage to the cells of the body. Antibiotics and other medicines, however, are helpful in treating infections that sometimes follow excessive exposure to radiation.

Almost all the radiation that people absorb from fallout particles comes from particles outside their own bodies. Only simple precautions are necessary to avoid swallowing the particles. Because of their size (like grains of sand), it is practically impossible to inhale them.

People exposed to fallout radiation do not become radioactive and therefore dangerous to other people. Radiation

FALLOUT CONDITIONS FROM A RANDOM ASSUMED ATTACK AGAINST A
WIDE RANGE OF TARGETS: MILITARY, INDUSTRIAL AND POPULATION

A SPRING DAY

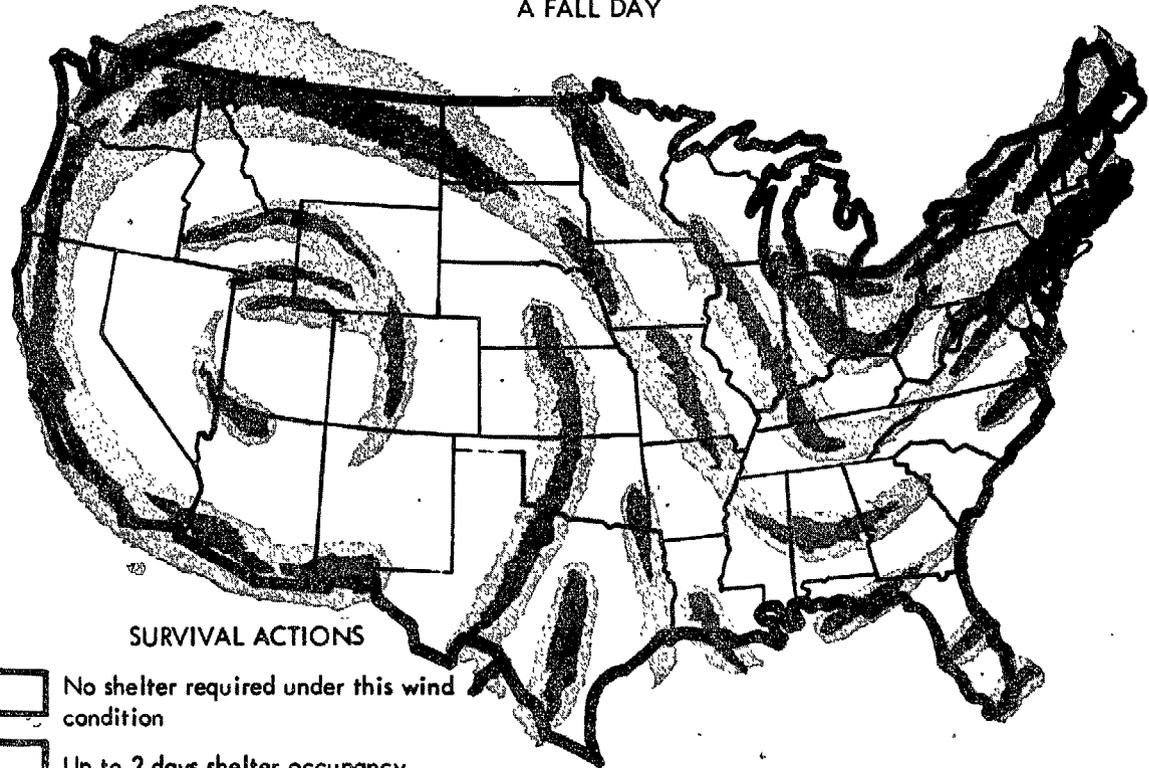


SURVIVAL ACTIONS

- No shelter required under this wind condition
- Up to 2 days shelter occupancy
- 2 days to 1 week shelter occupancy
- 1 week to 2 weeks shelter occupancy followed by decontamination in exceptional areas

FALLOUT CONDITIONS FROM A RANDOM ASSUMED ATTACK AGAINST A WIDE RANGE OF TARGETS: MILITARY, INDUSTRIAL AND POPULATION

A FALL DAY



SURVIVAL ACTIONS

-  No shelter required under this wind condition
-  Up to 2 days shelter occupancy
-  2 days to 1 week shelter occupancy
-  1 week to 2 weeks shelter occupancy followed by decontamination in exceptional areas

sickness is not contagious or infectious, and one person cannot catch it from another person.

Radiation exposure is measured in units called roentgens, after the German physicist who discovered them. During the average lifetime, every human being receives about 10 roentgens of nuclear radiation from natural sources. Exposure to more than 300 roentgens over a period of a few days--a dose which unprotected persons might receive after a nuclear attack--would cause sickness, nausea, and, possibly, death. Death would be certain if a person received a dose of 1,000 roentgens over a period of a few days.

The intensity of the gamma radiation emitted by fallout decreases in time through a process known as radioactive decay. A significant decrease in radioactivity occurs during the first 24 hours of its existence. If the gamma radiation level at a location is measured as 1,000 roentgens an hour 3-1/2 hours after an explosion, it will have been reduced to about 100 roentgens an hour 24 hours later.

Although the intensity of fallout radiation decreases rapidly, radiation levels at locations many miles from a ground burst could be so intense as to require 1- to 2-weeks shelter occupancy before it would be safe to leave. Short trips out of shelter, however, to replenish supplies, take radiation readings, and perform other essential functions would be possible earlier.

The purpose of fallout shelters is to provide protection from gamma radiation. Since the rays have enormous penetration ability, the most practical form of protection is placement of a sufficient amount of mass between fallout and the people to be protected. This shielding may be furnished by any type of material that places mass between the source of radiation and the people, but the more dense the material the better its protection. An earth barrier 3 feet thick will reduce gamma radiation to 1/1000 of the outside intensity. A concrete barrier 2 feet thick will provide equivalent protection.

Analyses of DOD studies indicate that, in a heavy attack, the radiation hazard outside those areas nearly totally destroyed by blast and heat effects would result in exposure of the surviving population to a radiation dose of

APPENDIX I

about 8,000 roentgens or less. *A reduction of this hazard to 1/40 of the outside, or unprotected, level (PF 40) would save the lives of more than 90 percent of the people who otherwise would die from the effects of fallout radiation.* PF 40 will provide adequate protection against fallout radiation hazards of nuclear attacks which might occur over the next few years, and studies of much larger attacks indicate that PF 40 will continue to be effective in reducing potential fatalities. Therefore PF 40 has been established by OCD as the minimum standard of protection for all public fallout shelters.

THE NATIONAL PLAN FOR EMERGENCY PREPAREDNESS

The National Plan for Emergency Preparedness, edited and published by OEP in December 1964, sets forth the basic principles, policies, responsibilities, preparations, and responses of civil government for meeting any kind of anticipated national defense emergency. The National Plan does not cover the peacetime natural disaster program. The planning assumptions contained in the National Plan remain valid today, broadly speaking, although there are additional up-to-date planning assumptions, agreed to on an interagency basis, available to the agencies charged with civil defense policy and planning.

The primary objective of emergency preparedness planning, as stated in the National Plan, is *national survival and recovery*. National survival and recovery would require involvement of all levels of government; but the Federal Government, by virtue of its war powers, must exercise pervasive direction and control in the interest of national survival. The Federal Government is responsible for the direction and coordination of the total national civil emergency preparedness program.

Responsibilities

Under the National Plan, OEP is responsible for advising and assisting the President in determining policy for planning, directing, and coordinating all nonmilitary emergency preparedness, including civil defense. OCD is responsible for the civil defense activities specified by the Federal Civil Defense Act of 1950, as amended, and by Executive Order No. 10952, including the formulation, development, execution, and administration of the national civil defense program.

Other Federal agencies have been assigned emergency responsibilities and functions related to their basic missions and capabilities. For example, Federal food and medical stockpiles are the responsibility of the Secretary of Agriculture and the Secretary of Health, Education, and Welfare, respectively. Federal preparedness and mobilization functions for electric power are centered in the Secretary of the Interior.

Each State is responsible for the preparedness and emergency operations of the State and its political subdivisions and for ensuring that such activities are compatible with those of the Federal Government. The government of each political subdivision is responsible for its preparedness and emergency operations in accordance with Federal and State plans and programs.

The private sector is responsible, in cooperation with appropriate Government agencies, for planning and executing measures designed to ensure the continuing functioning or rapid restoration of the essential elements of the national economy. Individuals are responsible for their own emergency needs and for participation in the general survival and recovery effort.

APPENDIX II

Civil defense

The National Plan includes a general outline of planned and organized actions in an emergency to protect lives and property and to maintain or restore services and facilities essential to survival. These actions are classed as (1) preventive--lessening vulnerability to anticipated attack effects--and (2) remedial--providing the means to sustain survivors and aid their recovery.

Five principal programs--damage assessment, communication, transportation, military support, and resource supply--provide support to the preventive and remedial civil defense programs. Certain administrative measures--such as financial support for emergency operating centers, State and local personnel and administration, and OCD-conducted research and development programs--support the overall civil defense program.

APPENDIX III

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF EMERGENCY PREPAREDNESS
WASHINGTON, D.C. 20504

OFFICE OF THE DIRECTOR

Mr. Irvine M. Crawford
Assistant Director, Civil Division
United States General Accounting Office
Washington, D. C. 20548

17 February 1971

Dear Mr. Crawford:

Thank you for the opportunity to review your draft report on the structure, activities and status of civil defense in the United States.

My comments follow:

1. The material on pages 13, 14 and 23 on assumptions regarding the threat is presumably drawn from The National Plan for Emergency Preparedness, which was published in 1964. It is suggested that this source be cited. Although the planning assumptions referred to remain, broadly speaking, valid today, there are fully up-to-date planning assumptions, agreed on an interagency basis, available to the agencies charged with civil defense policy and planning. These planning assumptions, however, are classified and are not available to the public.
2. As a matter of information, the developments and events listed on pages 37-38 have been taken into account in recent reviews of the civil defense program.
3. It is suggested that the language in line 6, page 38 be modified to read "...Preparedness to make a study of the civil defense program, with particular emphasis on ..."
4. As regards the Presidentially directed study of the relationship between disaster assistance and civil defense, referred to on page 38, I was not aware of efforts by your office to obtain information on this study. However, it would not be appropriate, in any event, for me or members of my staff to comment on this study before it has been reviewed by the President.

I note that you have referred your draft report to the Department of Defense for review.

Sincerely,


G. A. Lincoln
Director



ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

5 MAR 1971

SYSTEMS ANALYSIS

Mr. C. M. Bailey
Director, Defense Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Bailey:

The draft General Accounting Office Report on the "Study of the Structure, Activities, and Status of Civil Defense in the United States," (OSD Case #3213) forwarded by your letter of December 17, 1970 has been reviewed. In general, we consider the report a realistic analysis of the current civil defense posture, its capabilities and its limitations. As indicated in the introductory comments attached, we appreciate the objective approach taken by your office and the expenditure of time to perform this in-depth review.

The report states that the complementary relationship between active and passive defenses has been weakened by the reduction trend in civil defense budgets compared to increases in active defenses. This shift in budget emphasis during recent years is acknowledged but it is felt the implication in the report that there has been a reduction in priority and emphasis on civil defense preparations is incorrect. The discussion on pages 16 and 17 should be expanded to point out that the national involvement in military operations in Southeast Asia in mid and late 1960s created overriding requirements which forced budget increases in active forces and necessitated tighter fiscal constraints on all non-Southeast Asia programs of the Department.

Another factor which should be taken into consideration in analyzing the declining trend in civil defense appropriations is the reluctance of Congress to approve appropriations for civil defense in the amounts requested by the Administration. This is reflected in the table on page 12 of the report. For the nine year period shown, the Congress has been willing to appropriate only 43% of the funds requested. This has resulted in a growing tendency in the Executive Branch to limit budget requests to lower levels.

APPENDIX IV

The report points out "it would seem that the time is appropriate to reconsider the needs of civil defense and the best method of meeting such requirements." The Department is acutely aware of the necessity for this reevaluation. As noted in the report, there are two Administration study efforts underway which bear directly on this subject, one of which is now awaiting review by the National Security Council. The Congress is also aware and concerned about the need for reevaluation of the program. The House Armed Services Committee started hearings on October 13, 1970, for a general review of program developments since 1963.

At the present level of funding, OCD is limited to a national civil defense program based primarily on the use of existing resources. Under such a program there is no way to compensate for inadequacy in existing resources, such as fallout shelter. This type of program places maximum stress on the management capability of State and local governments. OCD has attempted to emphasize this aspect of civil defense readiness, fully recognizing and exploiting the fact that this kind of local and State readiness is equally applicable to non-nuclear emergencies.

While we believe that the present OCD programs are effective in readying State and local governments for all types of emergencies, we agree that the present gap in fallout shelter availability will continue to widen if the national civil defense program must continue to rely on resources which are developed essentially for other purposes.

Attached are detailed comments prepared by OCD on specific sections of the report. Following the introductory remarks, these comments are organized by the major recommendations or suggestions set forth on pages 3 - 5 of the report, followed by a general list of corrections and suggested clarifying changes. [See GAO note.]

Sincerely,



Philip A. Odeen
Principal Deputy Assistant
Secretary of Defense

Attachments

GAO note: OCD's general list of corrections and suggested clarifying changes have been considered and incorporated in the body of the report.

APPENDIX IV

INTRODUCTORY REMARKS

The Department of Defense appreciates and wishes to thank the General Accounting Office for the thorough in-depth objective study that was made in order to develop the Draft Report representing a study of the structure, activities and status of Civil Defense in the United States. The review was spread over a period of about 18 months with varying levels of manpower assigned and included reviewing the history and current status of civil defense programs conducted at Federal, State and local levels.

The GAO staff took the time to extensively read and review all the basic program documents relating to Civil Defense, including several DOD Damage Limiting studies, Congressional hearings and reports, material on Civil Defense Interagency Relationships, Legislative Reporting materials, the Federal Civil Defense Guide, the Annual Report, and the Annual Statistical Report. They also visited Regional, State and local Civil Defense offices to observe Civil Defense "at work."

The findings, conclusions and recommendations resulting from the study again demonstrates what can result from a detailed study. Every agency or committee that has studied the vulnerability of the United States to nuclear attack has come to the conclusion that a strong civil defense program is vital to the security of the nation. Such studies made since World War II are numerous. They include the Bull and Hopley studies within the Military establishment in 1946 and 1948, respectively; Project East River in 1952; the Kefauver Committee Report in 1955; the Holifield Subcommittee report in 1956; the Gaither Panel report in 1957; the Hart report in 1960; the Holifield Subcommittee report in 1962; the Hebert House Armed Services Subcommittee hearings and report in 1963; and the National Academy of Sciences study in 1963.

This GAO report also implicitly recognizes the need for and value of the civil defense program.

The history of the civil defense program is thus full of detailed justification of need, but as the GAO report illustrates, this history has been short of program funds to accomplish the recognized requirements.

The Department of Defense and the Administration recognize the need for broad policy decisions on Civil Defense and such decisions are expected to be made soon after the two studies referred to in the report are completed and acted upon by the President.

GAO Recommendation or Suggestion

"Questions have been raised concerning the need for new directions of effort and doubts expressed on the nature of some underlying civil defense assumptions, concepts and policies; and it would seem that the time is appropriate to reconsider the needs of civil defense and the best method of meeting such requirements."

DOD Comments

Broad policy decisions on the future direction of civil defense in the U.S. are needed. The OEP civil defense study and the Nelson Committee investigations should provide these decisions, hopefully in the near future. In addition, a special subcommittee of the House Armed Services Committee started hearings on the civil defense program on October 13, 1970.

The national fallout shelter policy was adopted in 1961 for the reasons provided on pages 9 and 10 of the GAO report. In addition, cost was an important consideration. Successive DOD studies have shown that a fallout shelter system is the most cost-effective (cost per life saved) defensive system. Only the first phase of the policy envisioned in 1961, e.g. the identification of fallout shelter in existing structures, has been implemented. Lack of legislative authority for shelter incentive payments and restrictive budgets have not permitted progression to the provision of additional shelter where the survey of existing structures could not meet the need.

The following comments relate to the issues raised on civil defense at the bottom of page 36.

Given the decision to limit civil defense measures to a fallout shelter oriented program, considerations of risk are not germane. Fallout, depending on the winds, may occur anywhere in the U.S. following a nuclear attack. Cities or industrial areas cannot be totally written off as unsuitable for fallout shelter because no one can predict exactly which cities or industrial areas will be targeted.

In damage limiting studies, although enemy weapons must be targeted as rationally as possible, many different sizes and types of attacks are studied. No one could accurately predict which of the anticipated attacks, if any, an enemy might use. But this is not to say that risk oriented programs which would provide blast shelters in the larger cities would not have advantages. Hypothetical alternative programs have been studied and show that blast shelters would save additional people at more cost.

APPENDIX IV

Many fallout shelter facilities provide low-level blast protection and recent research reveals that new building designs can be "slanted" to provide significant additional blast and fire protection at incremental costs of \$30 to \$60 per space. This is much less expensive than single-purpose blast shelters. The technical basis exists for such a modest blast shelter program and could be included in an experimental shelter program, if the funds were made available by the Congress.

Another cost-effective method of obtaining additional shelter, where needed, is the provision of portable ventilation devices (developed by OCD) to increase the capacity of many below ground shelter areas. Below ground shelter provides some increased protection from the direct effects of nuclear weapons. Funds were requested for the procurement and distribution of these devices in FYS 1965, 1966 and 1967 but were denied by the Congress. Requests have been deferred in recent years because of budgetary restrictions. Damage limiting studies and the OEP study have taken into considerations the developments on pages 3, 37 and 38 of the GAO report.

GAO Recommendation or Suggestion

"In this regard, in view of the current substantial lack of shelter space it appears that early consideration should be given to whether actions should be initiated to increase the number of available shelter spaces, especially in those areas which are currently under-protected."

DOD Comments

As stated in Chapters 4 and 7 of the GAO report, OCD does not have the authority to construct or pay for the construction of public shelter to overcome deficits of shelter. Requests for authorizing legislation were made to the Congress and \$460 million was included in the FY 1963 budget, \$175 million in the FY 1964 budget, and \$93.3 million in the FY 1965 budget to make incentive payments to public and non-profit private organizations for the incorporation of fallout shelter in new and existing buildings where shelter is needed such as in areas outside of major cities. The authorizing legislation and consequently the appropriations were not approved.

Sums of \$10 million in FY 1967, \$2.5 million in FY 1970 and \$1.5 million in FY 1971 were included in budget requests to test shelter incentive payments. Such tests do not require authorizing legislation. These amounts were also denied by the Congress. The FY 71 test envisioned incentive payments of only \$10 per added shelter space.

Many below ground shelter areas in existing buildings cannot be used to capacity because of lack of ventilation. The capacity of many of these shelters could be increased dramatically if portable ventilation kits, developed by OCD, could be provided. Funds in the amounts of \$50 million in FY 1965, \$25 million in FY 1966 and \$6 million in FY 1967 were requested of the Congress for procurement and distribution of portable ventilation kits. These requests were denied. When our budgets were further restricted (beginning in FY 1968) due to the Vietnam war, requests for these devices were deferred. Our latest estimate is that portable ventilation kits can provide additional below ground shelter spaces, where needed, at a cost of about \$1.20 per space.

Less than standard fallout shelter spaces, as an interim measure, for use in Community Shelter Planning are identified by the National Fallout Shelter Survey and the Home Fallout Protection Survey. Further information on this point is provided in the comments on page 30.

APPENDIX IV

GAO Recommendation or Suggestion

"In addition to actions already underway--shelter identification, warning and detection systems, financial assistance to states and local communities and research and development--or proposed for action by the Office of Civil Defense (See Chapter 3), the Secretary of Defense should seek the fullest cooperation of departments of the Government, which are, or will be, involved in programs which have the potential of providing vast quantities of fallout shelter space, such as mass transit and housing."

DOD Comments

We concur with the recommendation and, in fact, are now carrying it out. On October 28, 1969, the President signed Executive Order 11490 assigning emergency preparedness functions, including civil defense, to various Federal Agencies. The general provisions of this order contained a statement that all Agencies authorized to engage in building construction shall plan, design, and construct such buildings to protect the public to the maximum extent feasible. Where empowered to extend Federal financial assistance, they shall encourage recipients of such assistance to use standards for planning, design, and construction which will maximize protection for the public.

The Executive Order has been extremely helpful in getting OCD personnel entry into Federal Agencies to discuss shelter. There is a significant difference between Federally owned and Federally financed assisted projects. Whereas the Agencies are involved in construction of Federally owned (non-military) buildings having a valuation of about \$2 billion in Fiscal Year 1971, approximately \$7 billion of Federal grant funds were used for financial assistance in construction projects.

OCD is now working with Agencies that previously refused to have anything to do with shelter design and construction. An example of this is the Post Office Department. As a result of increased coordination during the past year (and the new Executive Order), they are including fallout protection in the design of many of their new post office facilities. This is a major accomplishment that we hope can be extended to other Agencies, especially those involved in programs to give financial aid on construction.

Under 50 USC App. 2287, the Secretary of Defense is mandated to design construction authorized under the annual Military Construction Authorization Acts using OCD protection techniques. This has been helpful in producing shelter on military installations which have a significant civilian population. Further this shelter can be made available to communities adjacent to the military installations.

GAO Recommendation or Suggestion

"GAO believes that the Secretary of Defense should also undertake a review of the current minimum Federal fallout protection standard to see if it should be revised downward to provide for encouraging use of the 'best available' space in an area to meet population needs. However, if a change to the current standard is not considered appropriate then the public should be made aware of those shelters which do not meet the minimum Federal protection standard and consequently may not be marked and stocked for emergency use."

DOD Comments

Any technically based program must have a standard as the goal of the program. This means that both objective and capability plans are required. Objective plans cover what is established as a desirable goal for the future and capability plans cover the use of whatever is available now. The Community Shelter Plans (CSP) are capabilities plans. The Federal guidance for developing such plans states that people should be matched to the best protected space currently available even though less than PF 40. Provision is also made for utilizing shelter at less than 10 square feet per occupant, and exceeding movement-time standards as necessary. None of these exceptions are deemed desirable, but are practical measures to be taken in case an attack occurs before the shelter system can be completed.

The PF 40 standard has been adopted as a civil defense planning objective for the future. This standard was lowered three times (from PF 5000 to PF 40) over the period 1955 to 1962 as more was learned about weapons phenomena. The basis for PF 40 is provided in the attached Federal Civil Defense Guide, Part A, Chapter 1, Appendix 1, September 1967. It must be remembered that this is a goal not only for identifying shelter but for designing it into new construction. If every citizen could have at least this shelter near his home and place of work several million more people could be saved in the event of an attack than if every one had, for example, PF 20 protection. In addition, millions more would escape radiation sickness and be in better physical condition to emerge from shelter and aid in recovery of the nation. Expressed differently, the fallout shelter with a higher PF can cope with a greater number of fallout contingencies than one with a lower PF. The choice of PF 40 was a compromise between wide shelter coverage and significant fallout protection.

APPENDIX IV

In summary, OCD believes that the PF 40 standard should be maintained as the goal for the ultimate national shelter posture to be actively pursued in shelter improvement and shelter development. However, this minimum goal should not be considered to be absolute when failure to meet the goal would result in no improvement at all. The "best available" concept can and is being applied in current operational planning.

With respect to shelter development in new construction, insistence on a PF 40 minimum is obviously not a practical position as long as OCD must rely on voluntary participation of building owners and designers to develop new shelter space. OCD provides technical design advice and assistance to maximize the inherent shelter potential in building projects, but must accept the decisions made by the architect and owner and whatever protection results from their action. This subject is discussed further in the general section under comments on coordination between Shelter Development and Community Shelter Planning.

As will be seen from the following material we are encouraging the use of best available protection in local civil defense operations and planning rather than discouraging such use.

Beginning in FY 1965 the survey was expanded to include small structures (less than 50 capacity) and best available shelter (less than PF 40) in shelter deficit areas of jurisdictions preparing CSPs. (The National Fallout Shelter Survey because of fund limitations has, in recent years, been limited to areas preparing CSPs.) Current survey procedures call for looking for PF 20 or better protection and recording protection down to PF 10 in facilities (other than one, two and three family homes) that have a potential of 10 or more spaces. In FY 1970 the survey identified 6.6 million PF 40+ spaces, 5.8 million PF 20-39 spaces and an estimated 4 million PF 10-19 spaces. These data are provided to local governments for use in preparing CSPs. These surveys looking for the "best available" space will be continued to the maximum extent, subject to fund availability.

CSP guidance provides for the use of PF 40+ shelter even though not licensed, marked or stocked. Protected space is preeminent. Even though a building owner refuses to sign a license agreement during peacetime, in a war emergency he will not likely object to the use of his building as a shelter. Only about half of the structures identified as having PF 40+ protection are stocked and many of these are not stocked to capacity. Many shelter facilities have potable water trapped in pipes and other receptacles and, especially in larger buildings, some food would normally be available. Guidance to the public includes advising them to bring certain provisions to public shelter, and in most areas it is expected that radiation will have decayed after about two days to the point that short foraging excursions can be made to obtain life sustaining supplies. Buildings with a PF of 40 or greater but less than

50 capacity are not stocked and are used, as needed, in CSPs. With respect to stocking, it can be seen that facilities providing less than standard protection are not treated differently than many standard shelters. Local governments are urged to have an increased readiness plan, to be activated during a period of strategic warning, for marking with paper signs (provided by OCD) all unmarked shelter facilities intended for occupancy (regardless of PF), as well as emergency plans for supplying shelters.

Not all PF 40/ shelters should be stocked or stocked to capacity as some are not properly located in relation to the population. However, many of the nearly 98,000 facilities identified but unstocked should be stocked, but our supply of shelter supplies is exhausted and our budgets and appropriations have been reduced to the point we have been unable to procure needed shelter supplies. Moreover, several of the medical kit items and much of the shelter rations should be replaced because of deterioration due to age.

If funds were available for procurement of shelter supplies it may be desirable to mark and stock any public shelter used in a CSP even though less than PF 40, but as better shelter comes into the inventory and substandard shelter is phased out, funds would be required to cover the expense of moving the stocks to the better shelter. In addition, experience indicates that if substandard shelters are marked and stocked as an interim measure the pressure mounts to further lower the shelter standard. Certainly a reluctance on the part of local civil defense officials to move stocks from one shelter to a better shelter could be anticipated.

The point is raised that in areas having an excess of PF 40/ shelter OCD makes no distinction as to best available shelter. In such a situation local planners will generally use massive buildings and below ground shelter space which will provide the best protection against nuclear weapons effects, in preference to lighter and smaller structures. This, however, must be weighed against distance, as closer lesser protected space may be superior to better protection that is more distant should the fallout arrive before people could get to distant shelters. These factors enter into all CSP allocation work whether or not enough standard shelter is available.

OCD does not support a change in current CSP guidance to require advising the public that fallout protection to which they are assigned may not meet the recommended Federal standard protection factor. If it is the best fallout protection available at the present time, they are being provided for to the extent possible with the resources available. If the people know that some shelters meet OCD standards and others do not then it is possible that far more people would try to crowd into the standard shelters in an emergency causing them to be uninhabitable.

Copies of this report are available from the U. S. General Accounting Office, Room 6417, 441 G Street, N W., Washington, D.C., 20548.

Copies are provided without charge to Members of Congress, congressional committee staff members, Government officials, members of the press, college libraries, faculty members and students. The price to the general public is \$1.00 a copy. Orders should be accompanied by cash or check.