

VOL. 1 NO. 4



CIVIL DEFENSE FORUM

OAK RIDGE CIVIL DEFENSE SOCIETY

ASSOCIATION FOR COMMUNITY-WIDE PROTECTION FROM NUCLEAR ATTACK

Also in this issue: **EVACUATION** AND DISPERSAL IN THE U.S.S.R. "The need for an effective Civil Defense is surely beyond dispute... No city, no family nor any honourable man or woman can repudiate this duty.."

-- Sir Winston Churchill

SURVIVE

VOL. 1 NO. 4

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OUT OF THE COBWEBS...

Vice President Hubert H. Humphrey was painfully sparing in his support of civil defense as a presidential candidate *(Survive, September-October, 1968, page 14). However, Senator* Hubert H. Humphrey was noticeably warmer in support of civil defense in 1958 during the Eisenhower administration. CD Director Roscoe Burr of Seattle quotes Humphrey in his "Call to Arms for Civil Defense" at the National Civil Defense Conference of that year. Said Humphrey:

"Real leadership is required from the President. If the Congress is reluctant - which it is - if the public is apathetic - which it is - then it will take a clear call from the President - a speech as forceful as either his *Atoms For Peace* or his Middle East speeches to arouse the American public to the mortal danger Civil Defense authorities believe we face. Occasional paragraphs in a State of the Union message or in the Presidential Budget document are not enough. A major and continuing effort is demanded. If the American people are informed they will support the measures necessary to improve our civil defense structure."

EX-CD CHIEF CRITICIZES FEDERAL CD POLICY...

In delivering the keynote address at the United States Civil Defense Council's 17th annual conference in Milwaukee, on October 28th, Val Peterson, Civil Defense Administrator under President Eisenhower, asserted that Washington officials are withholding vital civil defense information. As an example he claimed that the public had not been adequately informed on the need for blast shelter in urban areas. In Peterson's words this policy of secrecy means "we are writing off the people in metropolitan areas."

"What disturbs me," he added, "is that residents . . . may be led to believe they are getting some protection."

Peterson further stated that civil defense had lost prestige and public respect when the Civil Defense Administrator was downgraded from a presidential appointee who attended cabinet and security council meetings. In his talk Peterson paid tribute to *Survive* and to the book, *Who Speaks For Civil Defense?* as serious efforts to bring the facts of realistic civil defense to light.

(In addition to his post as Civil Defense Administrator Peterson has served as Ambassador to Denmark and three terms as Governor of Nebraska. – Ed.)

"The mole psychology doesn't appeal to us ... neither did the foxhole psychology of World War II and Korea, nor the trench psychology of World War I ... but ... we dug our foxholes and our fathers and grandfathers dug their trenches ... A shelter policy is not a mole policy. It is the timeless policy of

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Survive presents authentic information relating to civil defense — to the survival of free government, the United States, and its people in the nuclear age. Its aim is public education in this field and service as a forum.

Materials for publication may be submitted for consideration. Articles (preferably illustrated) should be 1,000 to 2,500 words in length, slanted to the non-technical reader, and oriented toward the civil defense field. Views expressed in contributions to *Survive* are those of the authors and do not necessarily reflect *Survive* policy.

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humanity protecting itself from a hostile environment . . . the psychology that gave us warm clothes, the Sabin vaccine, and parachutes . . ."

-- Thomas Martin & Donald Latham in *Strategy For Survival* University of Arizona Press, Tucson, 1963

1



AT&T GOES UNDER ACROSS THE

-A Survive

A typical communications control center under construction. Once construction is completed earth is backfilled around the walls of the building and over its top. In this case a gently sloping hill will cover the structure and help to give it the required blast protection.

Communications capabilities in disaster situations require the survival and continued functioning of communications equipment and operating personnel. Realistic protection and systems flexibility assure the United States of continued land-line communications under the emergency conditions of both natural and nuclear disaster. Some of the advanced techniques developed by modern American communications pioneers are outlined in this staff study.*

Four years ago, on December 2, 1964, the American Telephone and Telegraph Company put its first blast-protected coaxial cable into service. It spans the country from New York to Los Angeles. It gives wide berth to all big cities and to all points that could be considered likely nuclear targets. Along its entire length it is buried at a depth of four feet or more. The eleven control centers which service it are also underground. The entire system is blast protected. It is built to withstand shock waves of over 100 pounds per square inch, which means that it will survive anything short of a direct hit by a nuclear weapon. It will also be able to function independent of outside help for a period of over three weeks.

*Note: Techniques described in this article apply to underground coaxial cable systems. Aboveground micro-wave systems also handle communications traffic but represent a completely different method not designed for nuclear attack operations. It is designed to provide added protection against natural disasters such as floods, hurricanes and tornadoes, while at the same time providing protection against the new threat of our times: nuclear attack.

This was a beginning. Since then other cables have been planned, and the nation is now being criss-crossed with these revolutionary systems. As this work progresses new improvements are being made to increase capacities and effectiveness. A Boston to San Francisco cable, for instance, will raise the initial limit of 9,300 two-way conversations to 32,400 over major portions of the route. This project is due for completion in 1972. A similar cable between Boston and Miami is now in operation south of Washington, and the section between Boston and Washington is under construction.

Another cable being built from New York to St. Louis and Chicago will also boast a capacity of 32,400 two-way

GROUND

NATION



Artist's simplified cutaway drawing of a typical communications control center after completion. Small entrance building is all that is

Staff Study Staff study completion. Since endance building is an inter is visible from the surface. These two-story, high-ceiling, maintenance and control headquarters average in the neighborhood of 60,000 square feet in area.

conversations. It will be finished in 1972. Plans for a new coaxial cable route for the Southwest were announced in September by AT&T's Long Lines Department. This new route will extend from St. Louis to Los Angeles, and it will handle 90,000 two-way calls at one time. Like its predecessors it will also carry several forms of land-line communications, including telegraph, teletypewriter, and television. Target date for completion is cautiously set in the middle seventies.

More projects are in the "thinking" stage. Each one requires close coordination with Bell System and independent telephone companies, and purchases of property and right-of-way. Each brings an army of executives, technicians and workers into play. Each brings its own problems and its own improvements. Each brings emergency communications - as well as everyday service - to a new plateau of effectiveness. Total costs for these projects (with complete equipment) now come to nearly one billion dollars. The additional cost of obtaining maximum protection for cable systems is small because of the inherent strength of the cable. Thus, increased communications reliability is provided economically.

All the underground coaxial projects have certain design characteristics in common. The control centers are responsible for maintenance of the cables at specified distances in each cable direction from the center. Above each underground control center is a small entrance building on the surface. This building controls access to the control center. Only authorized



Cables stretch cross-country from one communications center to another. The above Western Electric cable is being laid across the Mojave Desert in California.

personnel are admitted to the stairwell inside. The check point here is provided with telephone connections to control personnel, as well as with closed-circuit television. The stairwell ends at a 3,200-pound lead-lined, motor-operated concrete door. The door slowly opens while a loud bell rings and a red light burns. These signals give notice that entrance (or exit) mechanisms are in operation. Inside is a small access vault where those entering the installation must wait while the first door closes. Once closed, a second 3,200-pound door leading directly into the communications center slowly opens, and slowly closes, again accompanied by red light and clanging bell.

Outer walls of the control center are 18-24 inches thick. Inside all vulnerable equipment is individually shock-mounted. Flexible piping is used where utilities penetrate walls. Stocked emergency living quarters are available for operating personnel. Emergency generators stand ready to supply power. Emergency fuel is stored in buried tanks. Ventilation intakes would automatically close upon detection of a nuclear blast. After the blast, filters would cut in. Special blast-protected radiological monitoring equipment positioned above the control center would report radiation levels to those inside.

These "hardened" construction techniques give the control centers effective "target area" blast protection in non-target locations. Protection from fallout radiation is over 100 times greater than that specified by the Office of Civil Defense for government emergency operating centers.

Why?

Why has the American Telephone and Telegraph Company in the past ten years devoted a major portion of its efforts toward perfecting a system of subterranean communications capable of withstanding both natural and nuclear disaster? A Long Lines Department engineering spokesman answers the question in this way:

"It has always been a Bell System practice to provide economically prudent means of protecting telephone plant against hazards that might interrupt communications services.

"Throughout the years, the need for continuous communications service has become increasingly critical. Technological innovations have been made to provide every possible measure of protection against natural catastrophies, such as floods and hurricanes, and manmade failures, such as shock waves from nuclear blast or construction work.

"New facilities are planned using these innovations to provide maximum service continuity. But these are only



Shock-mounted equipment is standard in all control centers. Note heavy-duty springs above ready to absorb ground shock. (Note: Shock mountings artificially colored.)



Buried amplifying stations such as this one dot every cross-country cable at close intervals. Access for maintenance personnel is through manhole at top.

additions to an existing network that strongly promotes survivability through use of route diversity, alternate route switching, restoration procedures, automatic line switching, emergency power, etc.

"Coaxial cable systems most economically meet present demands for additional circuits where there are large requirements, where there is the need for facilities that will be compatible in the next decade with communications systems now under development, and where maximum continuity is required."

Everyday hazards also must be taken into account. The two most common hazards are lightning and construction contractors. Lightning can travel along the cables heating and vaporizing moisture and other substances. The resulting pressures sometimes damage the tubes which make up the cable. Contractors are apt to dig into lines, not knowing their exact locations. Efforts are made to make them aware of cable routes.

Amplifying stations - unmanned - are found at intervals of

one to four miles, depending upon the system. The stations boost the signal levels of the carrier to insure high quality service.

The policy of avoiding the larger cities and other possible nuclear targets creates a basic problem, because the communications systems must serve the target areas. This service is achieved by locating junction points outside the danger areas and running branch cables to them. Corona, California, for instance, is a junction point for Los Angeles. It is a town of 15,000, 50 miles to the southeast. Hillsboro, Missouri, a settlement of 500 people 30 miles southwest of St. Louis, serves as junction point for this metropolitan area. Nuclear detonations within a major city, therefore, with disruption of communications for that city by virtue of direct hits affecting its branch cables, would affect only the city involved in the attack and not the network itself. The same pattern is followed throughout the country. In case a number of metropolitan areas were subjected to attack, here again local branch lines only would normally be exposed to serious damages. In this way, in the event of nuclear attack, the possibility of this network of coaxial cables and communi-

STATISTICS OF BLAST-PROTECTED COAXIAL CABLE LINES LONG LINES DEPARTMENT, AMERICAN TELEPHONE AND TELEGRAPH COMPANY

ROUTE		Boston-NY-LA	Boston-SF	Boston-Miami	NY-StL-Chi	St L-LA
LENGTH (Miles)		4,000	3,350	1,800	2,000	1,900
*COST (Fully Equi	pped)	\$200,000,000	\$263,500,000	\$210,000,000	\$146,600,000	\$170,000,000
	RS	11	7	15	11	24
TWO-WAY CIRCU	ITS	9,300	32,400	32,400	32,400	90,000
NUMBER OF		12	20	20	20	22
AMPLIFYING STA		4	2	2	2	1
AT&T TYPE CODE	<u>, </u>	L-3	L-4	L-4	L-4	L-5
POUNDS PER SQU		100	100	100	100	100
	START	1959	1963	1965	1968	1969
CONSTRUCTION	FINISH	1964	1972	1970	1972	1975

*The great percentage of the cost for these routes is expense that would be involved in any kind of expansion.



In sight of the Washington Monument workmen lower cover on pre-cast manhole in which telephone amplifying equipment is installed for the branch line into Washington from the Boston-to-Miami coaxial cable. 6

cations centers being disabled by nuclear weapons blast effects is exceeding small. The high blast resistance means that any component would survive anything short of a direct hit. Thus, it is highly probable that in a nuclear attack upon the United States the "hardened" network of telephone communications would remain intact and would continue to serve the country as a whole without interruption through the crisis period.

Many other industrial organizations have also taken deliberate steps to protect their operations and to bring about survival and recovery of their functions in a nuclear war. Many of them have invested heavily in shelter facilities, remote locations, emergency operations, and disaster recovery. Many of them have extensive plans to do even more to foil an enemy effort to crush our machinery of production.

But AT&T, with vital support from Western Electric and other partners in the effort, has with its underground coaxial cable systems achieved a dramatic break-through in demonstrating what *can* be accomplished in the field of industrial survival. The growing network of protected coaxial cables and their hardened communications centers now reaches across the nation from the Atlantic to the Pacific and from the Great Lakes to the Gulf of Mexico. Through the thousands of additional circuits provided to the booming economy it takes care of the substantial year-to-year increases in telephone traffic. The first requirement for the network is that it be as practical and valuable in time of peace as it will be in time of war. It is indeed a true "dual-purpose project".



THE ESSENCE OF SECURITY, REFLECTIONS IN OFFICE

The Essence of Security, Reflections in Office, by Robert S. McNamara. Harper and Row, \$4.95. This book is Robert McNamara's case for his performance in office as United States Secretary of Defense. This alone makes it worth reading. In addition, its style is readable and concise, and it lacks the boring repetition that characterizes so many books of this type.

McNamara states clearly the basic assumptions on which foreign policy decisions of the Kennedy-Johnson era have been founded. "This nation," he writes, "made the decision at the end of World War II to base its own security on the principle of collective defense. This was done with the hope of helping to create, in keeping with the principles of the United Nations Charter, a world in which even the smallest state could look forward to an independent existence . . ." The reason for this decision is that, "Without dependable friends or allies, we surely would have to maintain a larger military establishment than at present. We also would have to reorient our industry and commerce to achieve a maximum degree of economic self-sufficiency, with a lower standard of living for our people and considerably less economic freedom . . . In time, we could find ourselves literally isolated, a 'Fortress America' still relatively prosperous, but surrounded by a sea of struggling, envious and unfriendly nations - a situation hardly likely to strengthen our own state of peace and security."

As to China and the Soviet Union, he feels that, "Realism bids us both to seek understanding with them and to recognize that, in some areas at least, they remain fundamentally hostile to us despite their own differences." He does look, however, for improvement in Soviet-U.S. relations once Hanoi's aggression in Southeast Asia is terminated. His discussion of China and her conflict with the Soviet Union is most interesting. Although we have found the Vietnam war to be discouraging, McNamara points to many encouraging signs of regional cooperation in Southeast Asia. He summarizes the Chinese objectives as being: "to establish herself as a major political influence in the area, exploiting Pakistan's and India's differences to her own advantage, preventing or delaying development of a strong India, and minimizing United States and Soviet influence." As for the Middle East he emphasizes that, "In recent years the Soviet Union has sent a considerable portion of its total economic and military aid to that region." Her shipments of arms to North Africa threaten to seriously disturb the balance of military power between the states in that area.

McNamara continues to press for a strong NATO saying, "Certainly the Soviet Union shows no sign of intending to reduce its own defense expenditures; on the contrary, it has increased them." The cost to the United States of losing Europe to the Russians is pointed up by the statement, "The six Common Market nations, plus the United Kingdom, have by themselves a total population, military manpower pool, and Gross National Product considerably larger than the Soviet Union. McNamara is also optimistic about the possibility of NATO stopping a Russian conventional attack on Western Europe. "On the whole," he says, "NATO already has the manpower in its active forces to deal with opposing combat units, even when East European divisions are counted." Its deficiency lies "in the need for improvement in deployment of NATO's forces in Germany, and the fact that not all of the supposedly combat-ready units are adequately trained, equipped and supplied."

A discussion in some detail is given as to the savings made by the Defense Department during McNamara's term of office, principally through his introduction of improved managerial methods and the use of operations research. It is disappointing however that he omits any mention of the TFX controversy. His explanation of the navy's rejection of its version of this fighter plane would have been interesting.

A section of the book is devoted to a description of the way the Defense Department has used its vast expenditures and its influence over men in the armed forces to promote social change within the United States. Examples are found in integration of the races in the armed forces and by attaching conditions to contracts let to manufacturers. Training programs have also led to development of new educational techniques.

Perhaps the most interesting thing about the book is the opportunity it affords us to understand McNamara's

philosophy on nuclear deterrence and his attitudes toward such questions as the development of nuclear defenses. Basic to his position seems to be his opinion that, "However foolish unlimited war may have been in the past, it is now no longer merely foolish, but suicidal as well." However, he appears to be unaware of studies which indicate that a defense may be possible that can reduce population losses below those suffered by some nations in World War II (See Survive, Vol. 1, No. 2, p. 7, and No. 3, p. 8). Surely an exaggerated view of the damages wrought by a nuclear attack can lead to serious miscalculation in our defense posture. He is quite clear when he claims, "The point is that a potential aggressor must believe that our assured-destruction capability is in fact actual, and that our will to use it in retaliation to an attack is in fact unwavering." Yet, is it possible to convince this potential aggressor that we will use this capability when he knows that we do not have the defenses to protect a large part of our population from his subsequent counterattacks?

It is also a bit alarming to note the certainty with which Mr. McNamara believes he can predict future events. For example he states, "The fact is, then, that neither the Soviet Union nor the United States can attack the other without being destroyed in retaliation." But were we not convinced that the Japanese would feel the same way about our retaliation just prior to World War II? When we add the question of scientific breakthroughs in defensive capabilities to the repeated failure of men in the past to accurately predict the course of a war, it is hard to be convinced that McNamara's statement will remain true very far into the future.

And if our deterrence fails, what then? Except for the antiballistic missile system (ABM), at no place in the book is there evidence that he has considered this eventuality seriously or spent appreciable time planning for it. A discussion of shelters to protect the population is not to be found. To McNamara, we live in a glass house, and once it is broken, there is no need to consider what follows.

Another matter of concern is McNamara's confidence that our nuclear weapons will shield Europe. The Russians know that we control the use of these weapons, even when they are located in other countries. They also must know that, with our poor state of civil defense, we stand to lose perhaps 80% of our population in a nuclear exchange. Will the Soviets believe that we would take the risk of releasing nuclear weapons to protect Europe? The French apparently do not believe it and have gone to great effort to develop their own nuclear force. Unless we can find a way to greatly reduce our own casualties, our allies can never feel confident of our protection for them.

Still another alarming fact is revealed in the book's discussion of the debate about deploying an ABM system. The key objection is revealed in the statement, "If we in turn opt for heavy ABM deployment, at whatever price, we can be certain that the Soviets will react to offset the advantage we would hope to gain." But then he goes on to say, "It is

precisely because of this certainty . . . that the four prominent scientists who have served with distinction as the Science Advisors to Presidents Eisenhower, Kennedy and Johnson, and the three outstanding men who have served as Directors of Research and Engineering to three Secretaries of Defense, have unanimously recommended against the deployment of an ABM system."

Now these scientists were competent to discuss technical questions about the ABM, but they were not experts on the question of what the Russians would do in response to our actions. In fact it is possible that scientists are below average at considering such questions because of their primary concern with scientific matters. Thus they may lack the breadth of understanding required to predict the behavior of nations. McNamara has revealed the danger that our government may be influenced in some critical decision by men appointed to their offices rather than elected and, in addition, drawn from a group whose views can easily be at strong variance with those of the American people. Also, the argument against deploying the ABM system seems as weak as the argument, "Why build tanks when the enemy can build anti-tank guns and rockets much more cheaply?" In addition there remains the question of attack from other countries that may acquire nuclear weapons (such as Red China) who might assume that their missiles launched from submarines would be mistaken for those from the Soviet Union.

One vital question is our nuclear attack capability relative to that of the Soviet Union. McNamara's statement on this point is, "But using the realistic measurement of the number of warheads . . . which could be delivered with accuracy and effectiveness on appropriate targets . . . the United States currently possesses a superiority over the Soviet Union of a least three or four to one." However, several other sources have indicated that the Russians are advancing so rapidly in this field that they will soon pass us. (See Edward Teller's comments, Survive, Vol. 1, No. 2, p. 1.) Although McNamara discounts the number of delivery vehicles as a measure, it is disconcerting to see newspaper reports with estimates of the British Institute for Strategic Studies that in 1965 the United States had four times as many ICBM's as the Russians; but in 1967 it had only 21/2 times as many; and at present supplies of land based ICBM's are approximately equal. However, present land plus fleet ICBM totals attribute about 1,700 to us and 1,100 to the Russians.

The book, then, leaves the impression of a supremely self-confident man who undoubtedly improved the operation of the Defense Department enormously, who made great efforts to economize and to improve the efficiency of conventional armed forces and our nuclear attack forces; but who, because he refused to take account of all eventualities and the possibility that he might have made some mistakes, may have left this country so weak in nuclear survival capacity that it will some day be blackmailed into the position of a second rate power or destroyed as a nation. \blacksquare

CAP - A CIVIL DEFENSE BONANZA

--prepared by the Information Office, National Headquarters, Civil Air Patrol

The Civil Air Patrol (CAP), a 28-year-old organization of aviation-oriented men, women and youth, 85,000 strong, is a uniquely important element in the civil defense plans of America.

As a volunteer civilian auxiliary of the United States Air Force, CAP is closely linked to Air Force operations and conducts aerial search and rescue operations under the direct supervision of the Air Force Aerospace Rescue and Recovery Service. CAP also assists the Air Force in disaster relief operations in natural disasters such as floods, hurricanes, tornadoes and earthquakes.

CAP represents a constantly ready and sizeable nucleus of trained personnel and specialized equipment which can be readily integrated into civil defense planning of all 50 states in the event of national emergency.

CAP organization and deployment (a CAP wing in each state) is specially tailored to participation in civil defense. Through a series of officially approved written agreements with the civil defense directors in all of the 50 states, CAP is prepared to place its personnel and physical resources at the



CAP's nation-wide network of radio stations – more than 21,500 – is manned by trained communicators and has the capacity for maintaining emergency communications in emergencies. CAP fixed land stations, such as this one, with the capability of transmitting and receiving, number nearly 10,000.



CAP AIRMEN, trained in aerial surveillance in small CAP aircraft such as this, would be available to Civil Defense to aid in disaster situations.

disposal of civil defense headquarters in the individual states either as complete units, statewide, or in small components at locations where civil defense action is required.

These CAP-CD agreements are so oriented that in the event of either a national emergency, or regional-state disaster necessitating civil defense measures, CAP can respond effectively to civil defense requirements.

Services CAP offers include:

Radiological monitoring. CAP has special teams in hundreds of units throughout the nation which are trained to detect and to measure radiological contamination.

Courier and messenger service. CAP's sizeable inventory of small aircraft is available to supplement aerial resources of CD in the essential task of moving CD staff and command personnel in disaster areas.

Aerial Surveillance. CAP airmen, trained in aerial observation can monitor surface traffic conditions and help CD establish orderly and unimpeded flow of traffic.

Airlift of Emergency personnel and supplies. CAP aircraft can make a significant contribution to civil defense activities by air transport of emergency supplies and critical personnel such as doctors, nurses, first aid specialists, etc.

Aerial reconnaissance. CAP aircraft and personnel can accomplish photographic flights, enabling civil defense to concentrate its resources where needed.

Radio communications. CAP maintains and operates a network of more than 21,000 radio stations with the capability of providing civil defense valuable communications nationwide, regional or local.

Total resources of CAP include 3,430 member-owned aircraft and 824 corporation-owned aircraft, 4,500 surface vehicles (trucks, sedans, jeeps, ambulances, vans) and 21,525 fixed mobile and air mobile radio stations.

This sizeable force is an "in-existence" reality with a capacity to boost, in significant measure, the overall civil defense mission: national survival. ■

SO BE IT!

by Don F. Guier

It is already clear that the new Nixon Administration will be free of certain philosophies and prejudices which have prevented the development of a realistic civil defense program in the United States.

The present Administration has been satisfied with "parity" in strategic weapons and the "mutual hostage" situation of our people along with the Soviets. It has sought to reduce the risk of nuclear war through negotiations and by setting an example of restraint in the arms race. Top-level endorsement of national security programs, including civil defense, has been considered bad politics, both domestic and foreign.

Strategic defense funds declined from 13% of the Federal budget to 4½% during the Kennedy-Johnson years. Decision by "cost effectiveness" further frustrated strengthening of defenses. The fiction of "technological plateau" was raised to justify policies compatible with parity and cost effectiveness. Warnings of rapid Soviet acceleration in quantity, quality and variety of strategic weapons systems (both offensive and defensive) were ignored even when they came from Congress, the Joint Chiefs and other reliable sources.

It is not surprising that civil defense has also been neglected. Established goals, programs and support have been abandoned. Commitments to state and local governments, industry and the public are no longer honored. There has been no serious consideration of protection for people in potential target cities from blast and heat effects of nuclear weapons.

Consider these comments on our current civil defense program:

Congressional committee chairman: "The Executive Department has never given Congress what I would consider to be an effective civil defense program."

Civil Defense Forum letter to President Johnson: "The United States is not doing what it should to reduce our vulnerability to nuclear attack."

Former Assistant Secretary of Defense: "The Federal Government's participation in civil defense over the years has not been consistent and has not been fully responsible."

European civil defense official: "You (the United States) have failed to give us this (civil defense) leadership. You are dreaming of angels in a world of devils."

There is every indication that strategic defense will not be neglected by the Nixon Administration. Mr. Nixon has been



advised by military experts, not starry-eyed advocates of unilateral disarmament. His position papers advocate negotiating "always from strength and never from weakness" and resolve "not to be left behind by the Soviets in their race toward superiority in nuclear striking power and ballistic missile defense."

However, neither Mr. Nixon's position papers nor the strategic defense studies on which the position papers were largely based, consider the role of *passive* defense.

It seems to me that there are two explanations as to why this component of strategic defense has been overlooked by the defense advisors to Mr. Nixon. First, it is a matter of professional tradition and pride that our military men have always been able to defend the homeland and protect civilians from foreign enemies. In strategic defense, this tradition naturally relies on offensive (deterrent) capability and on *active* (military) defenses. Second, research and risk studies emphasize weapons systems such as anti-ballistic missiles. The known art of hard shelter for people receives very little attention, and it is commonly *assumed* that civilian officials and the public are unable to effectively man and utilize passive defense systems.

The task facing responsible advocates of civil defense is to persuade the new Administration to make a complete new study of the subject. If this is done - thoroughly and objectively - and the results considered by top policy makers, there is every reason to believe that the Nixon Administration will assign to civil defense a role commensurate with its potential contribution to the security of our country.

I believe that civil defense in conjunction with active defenses could assure that the nation and the great majority of our people would survive any attack. Such a posture of *assured survival*, added to a credible *assured destruction* capability, would give us a *fully reliable* deterrent against surprise attack and nuclear blackmail.

If so, civil defense will emerge as a vital element of the strategic defense of the United States. \blacksquare

WARNING TIME REQUIREMENTS FOR BLAST SHELTERS

An incisive look into the question of how many people could really get to urban blast shelters in time if they were readily available and if warning were effective.

It has been evident for a long time that, if a large fraction of a nation's population is to survive a sizeable nuclear attack, blast shelters must be provided in some areas. The most serious objection as to the feasibility of such blast protection has been the briefness of the time between initial warning and the nuclear explosion in which people must reach blast shelters. For this reason the Civil Defense Research Project of the Oak Ridge National Laboratories is conducting an investigation to determine the length of time people will require to reach the protected areas and to determine what measures can be taken to reduce this time. A preliminary report by Dr. Henry F. Gaydos of some results obtained appears in the Project's Annual Progress Report (for March, 1966 - March, 1967) and is summarized here.

The first and most obvious requirement of a blast shelter system to minimize the entry time is to have shelter entrances as near as possible to the people. The tunnel grid system satisfies this requirement most admirably. (For a description of such a system proposed for Tucson, Arizona, see *Survive*, Vol. 1, No. 3, P.1.) This type of blast shelter is the one considered by the Oak Ridge group.

Any study of this kind is subject to a large number of variables and many uncertainties. For example, the effectiveness of blast shelters may be appreciably greater than indicated in this report because of two distinct possibilities, both extremely difficult to evaluate: First, the initial strike may come during a period of international tension or provocations so severe that many people occupy shelters for major portions of each day. Second, all areas not hit by the initial strike will be so vividly warned by it that the areas' blast shelters will be almost fully occupied for subsequent strikes.

For another example, it makes a difference whether the area served contains principally one and two story homes or tall buildings consisting of ten or more stories. The time required to evacuate tall buildings can become a major contribution to the time required to reach shelters. The best that can be done is to select a set of sample cases and to determine the required times for these samples under a clearly stated set of assumptions. One of the samples chosen by the Oak Ridge group is a 30-square-mile area of northwest Detroit. This is primarily a residential area. Some results for this sample are given in Dr. Gaydos's report.

The tunnel grid system considered for this Detroit area placed a shelter entranceway within four or five blocks of 12

every residence. However one of the principle purposes of the study was to determine how much advantage resulted from spacing entryways so that they serve equal areas and provide the shortest walk for users rather than spacing them at equal intervals along the tunnels.

A second major objective was to determine the adequacy of a 15-minute warning time. This figure has often been given as the warning provided by our radar system against an ICBM attack from the Soviet Union.

A third objective was to compare the effectiveness of a siren warning system with that of a radio-actuated device placed within each home and in public buildings. To shed light on this problem, estimates were made of the time required to alert 95% of the population in the area study for various levels of loudness of siren noise (measured in decibels (db)). An optimistic estimate and pessimistic estimate were made and the differences between them are shown in Table 1. "Alert time" in this table is the time required after the warning is sounded and before people decide to go to shelters. It increases with lower siren noise levels because fewer people hear and recognize the warning. A study of the Detroit area showed that most of it would have less than 80 db from existing sirens. On the other hand, it was estimated that most of the people would be alerted in one minute's time by the radio alert system. This conclusion was drawn from a study showing that 90% of the population responds to a telephone ring within 30 seconds.

Table 1.

Estimates of Times to Alert 95% of the Population for Various Levels of Siren Loudness

Siren Loudness Level (db)	Optimistic Alert Time (minutes)	Pessimistic Alert Time (minutes)
90 or more	2.5	7.5
80 to 90	5.0	12.0
70 to 80	10.0	17.5
less than 70	15.0	25.0

A study of walking speeds of people indicated that mean walking time to shelter entrances of 5 minutes, 7.5 minutes, and 10 minutes after the warning signal is emitted for various conditions is summarized in Table 2. Although these figures show the decided advantage of the Radio Warning Device, they also indicate that 15 minutes is not adequate warning time if essentially the entire population is to be sheltered. Even so, it would seem that blast shelters are worth while if only 60 percent find shelter as indicated in the fifteen-minute period.

Table 2.

The Percentages of the Population Reaching Shelter 15 minutes after Warning. (Northwest Detroit)

Type of Warning	Percent of Population
Radio Warning Device	60
Siren Warning	
Optimistic	50
Pessimistic	40

To indicate what can be done if more warning time is available, the Oak Ridge group computed the numbers summarized in Figure 1 indicating the percent of the population reaching shelters for various warning times, using a radio alert system. The results of the study indicate that arranging the shelter entrances so that each one serves an equal area and minimizing walking distances do very little to decrease times to reach the entrances. However such an improved arrangement does help to distribute the load of people passing through each one. For example, when the radio warning device is used, the maximum load of persons entering per minute occurred after from 10 to 15 minutes and was reduced by 13% when the entrance arrangement was changed from equal spacing along the tunnels to equal service areas.

It is interesting to note from Figure 1 that, although a 15-minute warning time seems to be too brief, 30 minutes might be acceptable. In addition, with the possibility of submarine launched missiles, we should consider times less than 15 minutes. Dr. Gaydos considers that the available warning time may range from 0 to 30 minutes. The answer to the question of how to provide these 30 minutes or more for people to reach shelter may lie in the antiballistic missile system. (See Edward Teller's article in *Survive*, Vol. 1, No. 2., p. 1.) This system might well be able to knock down the first incoming missiles. By the time it is exhausted, we may be able to have people in shelters if shelters are available.

Most experts are of the opinion that an attack would come only after a period of tension. During this period, people should be more alert to the warning signal and some may even be already in the shelters.

It is to be expected that further study and development will produce ways of reducing the times to reach shelter. (AAB)



U.S.S.R.

The following article appeared in Krasnaya Zvezda, the Journal of the Soviet Army. It was translated from Russian into English, French and German by the International Civil Defense Organization. The following is taken from the International Civil Defense Bulletin, published in Geneva, Switzerland.

In the U.S.S.R., as in many other countries, special attention is given to evacuation and dispersal as a means of civil defense. Evacuating and dispersing city dwellers to less exposed areas is considered one of the most efficient means of protection against weapons of mass destruction.

It is generally agreed that evacuation and dispersal under conditions which prevail today require a detailed and precise organization of personnel and materials. The population, for its part, must strictly follow the given instructions at the moment of evacuation and dispersal. Citizens must be well informed on preparation for and implementation of evacuation procedures, as well as on their expected conduct.

Industries, institutions and organizations will receive instructions on where, how, by what transport means, and from which assembly area their personnel will be evacuated. This information will then go to all those who are to be evacuated. Thus, people in the cities will be informed in detail on everything connected with their evacuation. For this purpose a specially selected information staff will occupy one or more buildings. In the larger cities, where workers and employees live scattered about town, it is more difficult to keep the public informed. In such cases the local radio, television and telephone, as well as posters, will be used.

In the U.S.S.R. the starting point for all evacuation and dispersal operations is the place of employment. Only retired people are evacuated from their homes. Hence, evacuation and dispersal measures are carried out from assembly areas that tie in with employment locations. All personnel and all means of transportation are gathered together in these assembly areas. Routes to be followed outside towns are determined in advance. Assembly areas for retired persons living alone are established by the various housing offices. Every person to be evacuated knows the address and number of his assembly area beforehand.

Organizational plans include provisions to prevent assembly 14

areas being overrun by too many evacuees at one time, as this could completely paralyze city traffic. Therefore, each industry, workshop or institution has a predetermined time for evacuation.

All those to be evacuated receive a special identification card. Each card has three parts: the original card, a copy and a control slip. It contains: surname and first name of the person to be evacuated, the father's first name, date and place of birth, home address, number and address of the assembly area and of the reception center. This special card, together with the regular identity card, are the official documents of the person to be evacuated and guarantee him his rights in case of emergency. The control slip is picked up at the assembly area upon arrival thereat for control purposes, and the evacuated person turns in the copy of the card when he arrives at the reception center.

When informed that an evacuation operation has been launched, the person concerned gathers and packs his personal belongings (clothes and food) up to a limit of 110 pounds. He is advised to take his identity card, money, his military papers, his birth certificate and other documents, as well as his evacuation card. He must check beforehand the time he needs to get prepared and to reach the assembly area so as to get there on time. He is also cautioned not to arrive too early, i.e. before the time indicated. Before leaving his home, the evacuee must turn off the electricity and gas, and must lock doors and windows. Finally, he must inform the caretaker of his building of his departure and instruct him to keep an eye on his apartment.

When he arrives at the assembly area the evacuee will register and hand in his control slip. He then receives his transportation ticket. Then, following instructions and guidelines of the evacuation committee and the supervisors, the evacuee takes his allotted seat in the train or other transport vehicle. No getting off or changing of places or cars is allowed after boarding. At the reception center all evacuees turn in copies of their evacuation cards, are registered with the lodging committee, receive lodging papers and are accompanied to their living quarters. Then the evacuees receive tickets with which they can buy or receive through the local markets the food and other necessities they will need. In order to avoid confusion in the lodging of evacuees changes in lodging plans from one locality to another are prohibited.

In the reception center immediate arrangements are made for protection against fallout radiation. Empty cellars, underground silos and other spaces are adapted to this use. Simple trench-type shelters are dug. The evacuated city dwellers participate actively in this work. Medical care at the reception centers is supplied by local hospitals and first aid stations supplemented by medical and auxiliary personnel recruited from among evacuated persons. Medical care is also provided at assembly areas and intermediary stations. Furthermore, each evacuation train or convoy has its own first aid section organized with the help of evacuated physicians and nurses.

Local authorities take steps to assign jobs to everyone capable of working. Those trained in the political field will maintain order and discipline during evacuation and dispersal. With this in mind, authorities stress the need for and the significance of such evacuation measures during peace time. During evacuation the population is constantly kept informed of the situation and special measures that must be taken.

INTERLAKEN

Following are concluding notes on the proceedings at the Interlaken (Switzerland) Radiation Conference held under the auspices of the Fachverband für Strahlenschutz (Technical Union¹ for Radiation Protection).

It has long been known that radioactive elements in fallout could be assimilated by plants and then become part of food consumed by humans. The danger from the element strontium-90 is recognized since it can replace calcium in cow's milk and from there be absorbed into human bones, particularly those of growing children. From this location, it can fire its radiation into human tissue at close range. However it is not too difficult to control this problem by temporarily eliminating foods such as milk from human diets and providing calcium from a purified source. It is also relatively easy to eliminate strontium-90 from milk itself.

It was clear at the conference that much more concern centered around another element, radioactive iodine, which is also contained in fallout. Of particular interest was the effect of this element on the thyroid glands of small children living in the Marshall Islands at the time of the Pacific "Bravo" nuclear test of 1954. An unexpected shift of winds caused an excessive amount of fallout to come down in this area. Some 10 to 14 years after the explosion it was discovered that these children had received a thyroid radiation dose of 700 to 1400 rads compared to about 175 rads that they received from whole body radiation originating from fallout particles outside their bodies. Thus the ratio of thyroid to total body radiation was between 4 to 1 and 8 to 1. It was recommended that further animal research be carried out to determine the maximum safe thyroid dosage for small children. It would be particularly desirable, it was felt, if therapeutic drugs could be found to counteract radio iodine deposition in thyroid glands.

The availability of radiation monitoring instruments was also discussed. It was pointed out that the people who are concerned with radiological defense in war emergencies have a different language from those who deal with radiation safety in civilian life. Enough nuclear bomb testing has been done so that the radiological monitoring and decontamination specialists know exactly what to do. In peacetime nuclear catastrophies, this experience is lacking. This latter case differs from bomb explosions in that analysis of what radioactive elements are present is necessary. Actually, three different classes of emergencies are involved: (a) nuclear warfare, (b) accidents involving nuclear weapons, and (c) civilian nuclear accidents with nuclear piles or other sources of radioactivity.

There seem to be no problems in the construction of proper radiological monitoring equipment. For instruments for monitoring fallout distribution in a nuclear explosion, most people believe an upper limit to their range should be at least 100 Roentgens/hour although some believe 10 Roentgens/hour is sufficient. For special accidents such as those with nuclear reactors, instruments may be needed capable of reading up to 2000 Roentgens/hour.

The medical doctors at the conference as well as the majority of the other participants believed that in emergencies civilians should carry dosimeters registering up to several thousand Roentgens to determine the total whole body radiation that they have received.

Although some of the conclusions reached at the conference will be subject to change as additional information becomes available, the consensus was that the conference was of great value in summarizing current knowledge and in pointing up areas where additional research is needed. (WL and AAB)

EDITORIALS.....

KUDOS FOR OCD

A major reason for Survive's existence is the critical scrutiny of governmental authority and policies with respect to civil defense. We believe that in the past the cause of civil defense has suffered from lack of such criticism, not by those opposed to civil defense, but by those who favor civil defense.

However, criticism should include giving credit where credit is due. In the execution of government policies many people and divisions of the Office of Civil Defense deserve special credit. For example, working within the government's restrictive policies, it is difficult to see how the government could get more for its money than it has from the OCD Division of Technical Services. This division has recognized that fallout radiation is the most important danger of a nuclear holocaust, and it has succeeded, all out of proportion to its shoestring budget, in moving the country, including the construction industry with its immense inertia, toward awareness of the need for protection from fallout radiation. Furthermore, it has developed a sound base of technical information for such protection, and it has efficiently procured a national inventory of existing protected space and stocked much of this space with survival supplies.

Ironically, the very magnitude of these successes relative to the OCD budget may be criticized as having tended to hull Congress into feeling that our civil defense budget and policies approach adequacy.

Probably OCD should bear but little share of the blame for:

- (1) the gross inadequacy of this budget, and
- (2) the disastrously rigid policy of almost complete neglect of blast protection and fire protection, which actually, as overkill capabilities increase, are approaching equality in importance with radiation protection.

These deficiencies are at the heart of the developing American tragedy on civil defense, and Congress's somnolence on them can be blamed primarily on the recommendations (or lack of recommendations) to Congress of officials higher in the bureaucratic hierarchy, specifically, the Secretary of Defense, the Secretary of the Army, and the President himself – all so engrossed in the vast problem of military defense that they resist exposure to civil defense problems which are even more vast. After all, in the very nature of bureaucracy, policies and Congressional recommendations can hardly be changed from below.

Survive salutes the many able, dedicated men of OCD.

NO ROOM FOR SENTIMENT

The main editorial point to be drawn from "AT&T Goes Underground – Across the Nation" (p. 2) has been made here before, but it is too important not to reiterate:

Just one of America's industries annually spends more on projects which will feature protection of some of its hardware from nuclear disaster than the Federal Government spends to protect its 200 million citizens from the same disaster. The decisions on this industrial protection were based on the unsentimental benefit-cost ratios which must govern all industrial decisions. Also, as the article states, this protection consists of very high levels of blast and fire protection for hardware largely rurally located. In contrast, the government refuses even to recommend such protection for people – either rural or urban.

Perhaps it is too much to expect sentiment for human lives to influence a huge governmental bureaucracy any more than it would an industry. But then we must hope that a government might be influenced by benefit-cost ratios. Although wide variations in predicted casualties and construction costs have discouraged such calculations, they should not.

Let us take the lowest figure of the range of estimates of 20-to-100 million lives saved by high-level, comprehensive, protection; also the figure of \$50,000 per life which agrees with accident-claim settlements. The resulting minimum potential benefit is \$1 trillion! On the other hand, the cost of high-level protection has been estimated at from \$20 to \$50 billion. Using the highest of these values, the benefit-cost ratio is 20 to 1! Federal money is now being spent on public works projects with such ratios approaching unity.

Even though Americans continue to discount the sentimental value of civil defense in saving their own lives and the lives of their loved ones, perhaps this hugh payoff will sell it.

In 1880, 1881, 1885 and 1887 Johnstown, Pennsylvania experienced floods. Each time warnings were given that the spongy South Fork Dam might give way sending a devastating wall of water down the narrow valley to Johnstown. People became used to the warnings, even joked about the day the dam would break. On May 31, 1889 another flood gripped Johnstown. The dam appeared to be in danger of collapsing. Three warnings were dispatched notifying people living in the communities below the dam that it was in imminent danger of breaking. The messages were treated as scare propaganda of alarmists. They were ignored. The dam broke. Johnstown was wiped out.



LBJ AIDE ENVIES SWISS CD...

Dr. Lauriston S. Taylor is a special assistant to President Lyndon B. Johnson on civil defense planning. According to Zivilschutz, Swiss CD publication, Taylor evaluated Swiss civil defense as "the best in the world". Zivilschutz quotes him as follows:

"For one thing, the Swiss government has understood the problem and has set up the means to accomplish their programs. The government has educated people to the point where they understand and accept the problem. . .The whole question of defense against nuclear attack is not something that can be swept under a rug. I myself have been in a couple of shelters in apartment buildings in Switzerland, and consider them excellent protection. I only wish I had one at home."

Zivilschutz also points out that, in addition to being a key presidential adviser, Dr. Taylor is Executive Director of the Advisory Committee of the Office of Emergency Planning, President of the National Council on Radiation Protection and Measurements, Chairman of the International Commission on Radiation Units and Measurements, and Member of the International Commission on Radiological Protection.

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AMERICAN ARCHITECTS NOTE RUSSIAN "DISPERSION"... In a two-week, official visit to the Soviet Union and

N. C.

Hungary 82 prominent American architects were recently briefed on new Russian techniques of modern urban development. A basic principle found to apply to Russian planning of this kind appeared to them to be that of dispersion of industry and population. The careful allocation of land areas for present and future needs apparently has become for the Russians a requirement as important as building design itself.

In Moscow the group was exposed in detail to the progress already accomplished in this direction in the capital city. Moscow is encircled by an extensive "green belt" area consisting of parks, recreation facilities and even farms and farm villages. Fingers of this green belt penetrate inward toward the city's center and are there bordered by selfsufficient residential complexes. Outward from the green belt – i. e. on the far side of it – lie industrial areas, located so that transportation can serve them conveniently from the city housing areas. Industrial employees therefore fan out from their homes to factory locations instead of converging inward upon them as is the case in most American and Western European communities.

Decentralization is further aided by wide, straight boulevards geared to anticipated traffic loads many years ahead. These are spotted with pedestrian tunnels. Traffic lights are few. Expressways connecting Moscow with other parts of Russia are now in the early planning stage. In Moscow itself these expressways will be completely underground. Parking areas will also be underground.

The visit of the American architects to Russia and Hungary coincided with the first Soviet-American Symposium on Architecture and Urban Design. Their reports fit in to the pattern of civil defense preparedness (shelter, dispersion, and evacuation) noted by other visitors and civil defense commentators. \blacksquare

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Excerpt From Eugene P. Wigner's

"ADDRESS ON CIVIL DEFENSE"

At The Executive Offices Building

(To A Subcommittee Of The President's Science Advisory Committee)

"At present, the official policy of the U.S. is to rely on its 'retaliatory power' to discourage aggression. There are reasons to believe, however, that such reliance will be more and more precarious and that a force better balanced between offense and defense will be needed in the future. Let me try to name three such reasons.

"1. If we have no effective defense, technological progress will render it less and less expensive to acquire the capability to inflict enormous damage on the U.S. There will be an increasing temptation to acquire such capability and several nations will acquire it. In this way, lack of defense will promote proliferation of nuclear weapons.

"2. It is difficult to foresee how the USSR may use its capability to kill many tens of millions of our people on short notice and how it may use its capability to threaten to kill people. The situation when several nations will have such capability is hard to even imagine. A rich man at the mercy of several hungry and determined people, not greatly restrained morally, is unpleasant even to contemplate. If we are at odds with two or three other nations, and an attack on us occurs, it may be difficult to convince the rest of the world that we know where the attack comes from. We may not know it ourselves. 'Retaliation' would be very difficult under these conditions and all governments will know this.

"3. The image of the U.S. abroad will suffer badly if it relies solely on 'retaliation'. As compared with defense, 'retaliation' is a cruel and unjust policy – punishing the innocent people rather than the guilty government. The callousness of the attitude is sure to be exploited by opponents' propaganda.

"To these, let me add two of the old reasons in favor of the buildup of U.S. defenses.

"4. Disarmament will be easier if the possession of a few concealed weapons is not decisive.

"5. The situation in which opponents can murder each other is not a very desirable situation and is conducive to an increasing deterioration of international standards."

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COMING: in the January - February issue... Soviet Versus U.S. Offensive Forces, by C. M. Haaland (Oak Ridge National Laboratory)