



ARCHIVED - Archiving Content

Archived Content

Information identified as archived is provided for reference, research or recordkeeping purposes. It is not subject to the Government of Canada Web Standards and has not been altered or updated since it was archived. Please contact us to request a format other than those available.

ARCHIVÉE - Contenu archivé

Contenu archivé

L'information dont il est indiqué qu'elle est archivée est fournie à des fins de référence, de recherche ou de tenue de documents. Elle n'est pas assujettie aux normes Web du gouvernement du Canada et elle n'a pas été modifiée ou mise à jour depuis son archivage. Pour obtenir cette information dans un autre format, veuillez communiquer avec nous.

This document is archival in nature and is intended for those who wish to consult archival documents made available from the collection of Public Safety Canada.

Some of these documents are available in only one official language. Translation, to be provided by Public Safety Canada, is available upon request.

Le présent document a une valeur archivistique et fait partie des documents d'archives rendus disponibles par Sécurité publique Canada à ceux qui souhaitent consulter ces documents issus de sa collection.

Certains de ces documents ne sont disponibles que dans une langue officielle. Sécurité publique Canada fournira une traduction sur demande.

January-February 1978

EMERGENCY
PLANNING
Digest



Emergency Planning
Canada

Planification d'urgence
Canada

EMERGENCY PLANNING Digest

Vol. 5, No. 1

January-February 1978

Contents

Emergency Response	J. G. P. LANGTON	2
Public Shelters in Hamburg	ARTICLE	7
The Soviet CD Shelter Program	L. GOURÉ	9
The Main Direction — USSR	ARTICLE	16
Computers in Civil Defense	D. H. RAY	21
Index 1977		24

Published by:
EMERGENCY PLANNING CANADA
Ottawa, Ontario

Director General: Victor J. Walton

The EMERGENCY PLANNING DIGEST publishes six editions annually to provide current information and reference material on a broad range of subjects dealing with civil emergency planning. Copies may be received regularly by written request to Emergency Planning Canada, Ottawa, Ont. K1A 0W6.

In addition to publishing articles which reflect Canadian policies Digests may also publish articles by private individuals on subjects of interest to emergency planning programs. Such DIGEST articles and views expressed by contributors are not necessarily subscribed to by the Government of Canada.

Editor: Alex. M. Stirton

© Minister of Supply and Services Canada 1977
K1A 0S9

ISSN 0317-3518

EMERGENCY RESPONSE — SPRING FLOODING

by

John G. P. Langton M.I.M.H. C.D.
Planning Officer, New Brunswick Emergency Measures Organization

Paper presented at the Canadian Hydrology Symposium, Edmonton, Alberta, August, 1977

This paper states in general terms the foreseeable requirements for effective counter-measures in annual Spring flooding in the lower Saint John River Valley and the preparations which have been made. It describes the activities of provincial government departments in accordance with the Provincial Emergency Action Plan during the three phases of this type of emergency.

Introduction

The Saint John River Basin covers an area of 21,300 square miles, of which 10,950 square miles lie in New Brunswick, 2,750 square miles lie in Quebec and 7,600 square miles lie in Maine. The river is about 435 miles long and in its first 200 miles is fed by many small streams and by three rivers, two of which drain that part of the basin which lies in Northern Maine. Two other large tributaries, the Aroostook from Maine and the Tobique from Central New Brunswick, enter further down river. There are three hydro-electric installations up river from Fredericton at Mac-taquac, Beechwood and Grand Falls.

Records of flooding on the Saint John River in the Spring from the volume of water from snow melt, and from ice jams, date back to the earliest days of settlement. In 1701, the French settlement at Jemseg moved to Port Royal after a disastrous flood in the Spring of that year.

The prediction of ice jams is unreliable, but analysis of winter weather conditions has indicated that after winters where there is comparatively little snow and extended spells of below average temperatures, ice is much thicker and, on breakup, much more prone to jam and cause extensive flooding.

The dollar value of flood damage has escalated with the unrestricted increase of building on the flood plain of the river. The increased number of people placed at hazard has grown proportionately, and preventive measures are a must. Recommendations from a number of studies have resulted in the writing of the Flood Plain Act, which is now before the Legislative Assembly, and which when promulgated will — albeit belatedly — restrict building, and land use in flood plain areas.

The necessity to take positive steps to reduce the hazard to life, and property already in place in the flood plain, has resulted in the formulation of a contingency plan (the Provincial Emergency Action Plan) which is put into effect when required.

The trigger which sets off the activation of the plan, is information supplied by the Flood Forecast Centre which was established, very fortunately, in early 1973 and which is now to operate on a year round basis.

The Provincial Emergency Action Plan

Before the disastrous flood in April, 1973, no comprehensive anti-flood plan existed. In that year, apart from action at the Forecast Centre, no preparatory work was carried out during the "Onset" phase. The greater part of the conduct of operations during the "Impact and "Recovery" phases was on an ad hoc basis with the newly organized New Brunswick Emergency Measures Organization assuming the direction, control and coordination of activities.

Subsequently, in that year a Flood Fighting Plan was prepared by NB EMO, and was put into operation in the Spring of 1974. From this plan and with the experience gained during the years '73 and '74, a comprehensive all hazards plan was prepared. This plan, which was completed in 1975, is called the Provincial Emergency Action Plan.

In this plan, government departments (and certain private agencies which have committed their support) are assigned emergency responsibilities, and are represented on a Provincial Emergency Action Committee which is called into session at EMO Headquarters when necessary. After briefing,

an appreciation of the situation is made, priorities and tasks are decided, and immediate action commenced, with EMO as the overall directing, controlling and coordinating authority.

If flooding is anticipated down river from the Mactaquac Dam, which is about 12 miles up river from Fredericton, representatives of the following agencies would be called to EMO Headquarters as members of the Provincial Action Committee where they would be informed on the anticipated emergency:

- Dept. of Agriculture
- New Brunswick Information Service
- Dept. of Natural Resources
- Dept. of Social Services
- Dept. of Supply & Services
- Dept. of Transportation & Communications
- Emergency Planning Canada (Federal)

The role and activities of each of these, and supporting departments, in the three phases of operations will be described in this paper.

Integrated Warning System

In a potential flood emergency situation, those expected to be adversely affected by it must be warned, and warned in such language and so frequently that a positive response will be engendered. It has been found that merely to announce to all and sundry that the river level will rise to X feet and that flooding can be expected in a given area is not enough. The message must be personal in content, identified as coming from a well known and recognized authority, must be specific as it applies to each area and must be repeated frequently to achieve the desired effect. A point of contact for individual enquiries must also be established to provide up-to-the-minute information, advice and assistance.

During the past four years, an integrated warning system has been developed by NB EMO and is accepted by the public to the extent that when a known threat is notified to residents in any area in the province, appropriate action by most of them can be expected within a very short time. This warning system is also used in all hazardous situations.

Communications

An efficient and reliable information gathering, collating, evaluating and disseminating system is essential to the successful prosecution of any operation. In EMO Headquarters during operations,

a Communications Facility, comprising a Public Information Office, a Message Centre and a Press Room, is set up under the general supervision of New Brunswick Information Service.

The Public Information Office with telephones manned mainly by RCMP Auxiliaries receives requests, for information, advice or assistance from the public. The telephone number of this office is broadcast to the public as soon as it is operational. Requests for assistance are passed to the Message Centre Supervisor who channels them to the appropriate agency for action.

The Message Centre is equipped with telephones, and transceivers on province-wide radio systems which include, Dept. of Transportation in contact with all regional garages, RCMP in contact with detachments, and Dept. of Natural Resources in contact with forest ranger stations. Other provincial radio systems are available: Dept. of Agriculture, Dept. of Health and NB Electric Power Commission. As well, amateur HF, VHF and CB radios are utilized.

A constant stream of relevant information is available to the Director of Operations and PEAC members, and immediate contact to any part of the province is assured.

The Press Room is made available to radio and TV stations for direct broadcasts. Typewriters and telephones are available to newsmen. News releases containing accurate information are made available to the news media representatives who have the opportunity to learn exactly what is happening and where.

Anatomy of a Flood Operation

PHASE ONE — ONSET

During this phase, which for practical purposes begins early in March, a number of agencies commence activities as follows:

Flood Forecast Centre, is responsible for providing information on river flow, predicts expected river levels for the ensuing five days at various points along the course of the Saint John River, and informs a restricted list of agencies via a daily forecast. An information bulletin in general terms is also released.

NB EMO, is responsible for establishing an Emergency Headquarters, direction, control and coordination of operations and issuing warnings of impending emergencies, ensures that the Provincial Emergency Action Plan is current by checking

all communications systems, liaison with the State of Maine Civil Emergency Preparedness Bureau, Emergency Planning Canada and other agencies and generally oiling the operational machinery by reviewing and updating Standard Operating Procedures.

Dept. of Agriculture, is responsible for preservation of livestock, stored crops and farm stores, surveys all farms in the danger area and compiles data on number and location of people, livestock, quantities of stored crops, and farm stores which may have to be moved. Arrangements for transport, alternate storage, stabling, feeding and management of livestock (including milking and delivery of milk to processors) are also updated. The alternative housing of people is planned for by Emergency Social Services personnel.

New Brunswick Information Service, is responsible for the supervision of the Communications Facility, ensures that the Dept. of Supply & Services have had the telephones in the Public Information Office, Message Centre and Press Room connected up by NB Tel and arranges with radio and TV stations, and newspapers for manning the Press Room.

Dept. of Natural Resources, is responsible for rescue, evacuation of people from threatened areas and control of rescue personnel and equipment (operators, vehicles and boats), ensures that transport and labour is available on call at short notice. (The Dept. of Education has an important support role in the provision of school buses for evacuation of people.)

Dept. of Social Services, through its Emergency Social Services is responsible for reception, registration, lodging, feeding and personal services for evacuees, confirms availability of alternate accommodation of people who may be evacuated from their homes and arranges for their feeding and welfare. Health considerations are the responsibility of the Dept. of Health. Confirmation of participation by Salvation Army, Red Cross and other voluntary bodies is also ensured.

Dept. of Supply & Services, is responsible for manning and operating the Public Information Office and Message Centre, ensures that the telephone lines are connected and usable, and arranges with RCMP for manning on a 24 hour basis if this becomes necessary.

Dept. of Transportation, is responsible for controlling the use of highways, establishes road blocks

in vulnerable areas in conjunction with RCMP, and issues daily road reports. Arrangements are made for visual checks in known danger areas. The department is also responsible for emergency radio communications in the Message Centre and in this regard ensures that radio sets and operators are available and ready for operation.

Other Departments and Agencies, which may be required to provide assistance, are placed on Stand-by which requires a representative to be on call on a 24 hour basis.

Emergency Planning Canada is requested to check with federal departments, which may be requested to provide assistance in men or equipment, and to ensure that they are ready to provide such support immediately on request.

All agencies remain on Stand-by until danger of extensive flooding is past or until predictions from the Flood Forecast Centre indicate that Phase 2 action is expected.

PHASE TWO — IMPACT

This begins when information is received at EMO Headquarters, either in the daily forecast or by phone, from the Flood Control Centre that some degree of flooding is to be expected.

When the river is predicted to reach certain stages, action is begun by the various agencies.

For example, if a predicted stage of 21 feet at Fredericton is reached, water will flow across the Trans Canada Highway at its lowest elevation and traffic control must be instituted in advance.

If 22 feet, minor flooding occurs in low lying areas due to back-up in storm drains and sewers.

If 23 feet, severe flooding of these areas necessitates evacuation of some families.

If 24 feet, several sections of the Trans Canada Highway are inundated and vehicular traffic must be diverted around flooded sections. More families must be evacuated and some farms.

If 25 feet, general evacuation of certain areas involving several hundred people must be undertaken.

If 26 feet, a complete evacuation of farms and buildings must be completed to prevent a repeat of the 1973 evacuation problems.

Flood Forecast Centre monitors conditions affecting flow on a round the clock basis, and advised EMO Headquarters of any significant changes.

NB EMO calls the entire Provincial Emergency Action Committee into session on a 24 hour basis and issues preliminary evacuation instructions. Bulletins containing advice to householders as to precautions to be taken before leaving their homes are broadcast. Advice to farmers is prepared by the Dept. of Agriculture and broadcast from EMO Headquarters. When predicted water levels dictate, departments with lead roles proceed with evacuation, re-housing, etc., making regular progress reports to EMO Headquarters. Any problems which cannot be resolved on the spot are referred to EMO for solution.

Dept. of Agriculture, from a prepared movement schedule, informs farmers what time to expect transport and labour to remove animals, stored crops and farm stores, and proceeds with their evacuation plan.

Dept. of Health makes medical and nursing staff available to provide health care at evacuee reception centres and to assist anyone requiring special care or transport.

New Brunswick Information Service assumes direct supervision of the Communications Facility on a 24 hour basis.

Dept. of Justice (RCMP) provides traffic control and security patrols in evacuated areas. (RCMP Auxiliaries are used to assist regular force personnel.)

Dept. of Natural Resources personnel help families to leave their homes and direct them to reception centres set up by Emergency Social Services. (Transportation is provided where necessary.)

Emergency Social Services, in accordance with their plan, open and staff reception centres as required to take care of evacuees. A registration and inquiry cell provides information to friends and relatives on request.

Dept. of Supply & Services operate the Public Information Office and Message Centre on a 24 hour basis. Another responsibility of this department is the provision of manpower. In this they are assisted by the federal Dept. of Manpower and Immigration whose offices and personnel are used for the registration, and allocation of volunteers to specific tasks.

Dept. of Transportation patrols highways, setting up and manning road blocks where necessary, issues road reports, informs drivers of alternate routes and assists other departments by providing heavy equipment and operators.

PHASE THREE — RECOVERY

This phase really begins sometime during Phase 2, when an estimate of the extent of damage can be formed. Arrangements for assessment of damage and the return and rehabilitation of evacuees is the prime concern.

Action by most of the participating agencies winds down to a standstill, except for EMO which is responsible for collating damage estimates in the public sector and the administration of any financial compensation program in the private sector.

Homeless people and animals are cared for until return to homes and farms is possible. A number of agencies assist in the assessment of damage.

Compensation

Federal cost sharing guidelines require the determination of geographic boundaries and lay down many parameters within which eligibility for financial compensation lies.

Under present arrangements, the province is responsible for bearing the costs of operations and rehabilitation on a one dollar per capita, based on the provincial population (677,250). That is to say, that if the total is less than \$677,250.00, the province bears the entire cost. The federal government pays 50% of the next two dollars per capita, 75% of the next two dollars and 90% of the remainder.

Federal contributions are based on federal interpretation and do not necessarily validate payments made by the province. The program represents a reimbursement to the province of an agreed share of certain expenditures and is not a *direct aid* to the claimant.

Human Behaviour

Human behaviour under stress has been and continues to be the subject of scientific research. A few examples observed in the 1973 flood situation may be of interest.

Two old ladies who refused to leave, even though the water had surrounded their home and completely filled the basement, explained to the Premier that they had never let the river drive them out before and would die rather than let it now. (The revised Emergency Measures Act provides authority for forcible removal of persons from endangered premises.)

A nurseryman, not believing the forecast, exhausted himself making makeshift platforms higher

and higher on which to place the flats of young plants in a vain effort to save them.

One farmer had a dilemma of a different kind. A moose took refuge on the roof of a newly built potato shed and the farmer could not decide whether to leave it there and risk it damaging the flimsy roof by stamping around or to shoot it and hope that in falling its weight would not collapse the roof. (It was eventually lured away but the potato shed was so badly damaged by floodwater that it had to be rebuilt anyway.)

The head of a family of three seemingly comfortably "camped out" in the upper storey of their home, where the water was half way up the stairs. On being asked by Premier Hatfield when did he first realize he was in trouble, replied, "The day I was born". They had food, water, beer and a boat with which to fetch more when needed. What more could one need in such a situation?

Senior citizens evacuated from a nursing home to temporary accommodation in the University of New Brunswick looked on the affair as a great adventure and an enjoyable change from normal routine.

The attitude of the general public, government officials and the news media was, at first, condescendingly apathetic. "Who or what is EMO? Who says that there is going to be a flood? The spring freshet happens every year."

Fortunately, some news media personnel, apparently sensing a story, arrived at the ad hoc headquarters and having seen the forecast data, were convinced. Their co-operation in interrupting normal programs to publicize warning bulletins awakened everyone to the fact.

Although awakened, many were not convinced until it was almost too late. No human lives were lost and only a very few animals, but a great deal of loss and damage to moveable property could have been averted by a removal program for which there was time but no enthusiasm.

. . .

In the ensuing years, NB EMO has become established as the agency to be consulted for advice, and direction, not only in flood but in other types of emergency.

Many telephone calls are answered early in the year before there is any sign of flooding, and when forecasts so indicate there is little hesitation among those previously affected in acting on the warnings issued by NB EMO.

In 1974, circumstances dictated an evacuation of farm animals, and although the evacuation was halted after only 36 hours because of a more favourable prediction, there was no outcry.

Conclusion

The perennial problem of flooding on the lower Saint John River cannot be prevented at present. It has been said that the completion of the Dickey-Lincoln Dam in Northern Maine will relieve the problem to some extent but this will not be seen for several years. In the meantime, the contingency plan will continue to be improved, updated and used, but it will be of little avail without the critical information which can only be supplied by the hydrologists who man the Flood Forecast Centre. ▲

PUBLIC SHELTERS IN THE HAMBURG REGION*

At the end of the last war, there remained a wide range of shelters in Hamburg which were largely undamaged. A recent investigation showed 78 above-ground bunkers distributed throughout the City. Of these, seven were considered to be no longer worth repairing on grounds of cost.

This was also the case with the former anti-aircraft control tower at Heiligengeistfeld, which was equipped with ten quadruple guns. It was pulled down and a new Post Office built on its site.

The bunkers in Marienthalerstrasse and 'Muehlenkamp 11' were only half-completed by the end of the war. In some cases, window openings were made so that the premises could be turned to peace-time uses. In the above-ground shelter at 27-29, Hinrichsenstrasse, thirty bedsitters were obtained in this way — a most sensible peace-time use. Reconversion as a shelter is out of the question because of the cost.

Scattered across the city, there were also 11 above-ground bunkers, each of 374 sq.metres, eight deep bunkers of 77 to 6,179 sq. metres, seven specialised bunkers with a useful area of 38 to 453 sq. metres, 212 round bunkers and 339 pipe bunkers. Of these, the Federal Minister of the Interior eliminated 126 pipe bunkers and 142 round bunkers as no longer repairable. Thus, there remained in Hamburg 380 shelters which could be reinstated.

Up to this time no useful attempt had been made to strengthen and restore any of the shelters. Twenty above ground and deep shelters have been repaired to date, four are still under repair. As far as the bunkers are concerned there will then be some 28,000 shelter spaces available in long-stay public shelters.

In the course of planning for new transport works or new domestic and business premises, it became necessary to remove existing shelters. Removal was permitted on application by the site owner to the Federal Minister of the Interior with the requirement that a replacement shelter be provided. In this way, in Hamburg alone, 19 new shelters for 2,582 persons were built. Two further shelters for 175 persons are still in the planning stage. The cost of demolition had to be borne by the site owner. As a rule the Federal Government

contributed a sum towards the cost of the replacement building not greater than would have been required to repair the existing shelter. Disputes arose concerning the number of shelter places in the replacement buildings, the amount of the Federal subsidy, the reduction of usable space by the installation of ventilating plant, attendance, servicing and repair; in short the upkeep of the fixed civil defence installations.

In Hamburg, success was also achieved in combining large shelters and deep garages as multi-purpose buildings. As early as 1967 a deep garage under Finnlandhaus on the Aussenalster was ready for use. It provided improved protection against conventional weapons with additional reinforcement in outer walls, 1.10 metres thick. In 1971 a further for 1,992 persons with the same degree of protection followed in the deep garage in Starrosselstrasse. The occupants of these shelters are protected against the blast of a nuclear explosion up to 3 kp/cm² (about 40 p.s.i. Ed.). This affords protection against blast and heat and initial gamma radiation of nuclear weapons of 20KT and 5MT at distances of 400 metres and 5 kilometres respectively, as well as against incendiary bombs, fire, shrapnel, debris, biological and chemical weapons, the direct impact of HE bombs and shells of small calibre and the impact of larger calibre weapons in the vicinity. The shelter under Finnlandhaus is situated in the first and second basements. It has a peculiarity in that for reasons of construction, there are two expansion joints across the shelter. Both walls at these two joints are 0.55 metres thick; the doors in them are pressure doors and the ducts through them are flexible. Expansion joints were used because a high building of 12 floors was erected over the central part of the basements and the constructional separation into individual components at the sides and under the tower produced a much more economical solution. Expansion joints should be avoided if possible in shelters of high protection. They are permissible only if they are adapted to the protection of the building by their arrangement and construction, i.e., if the probable displacement of the shelter components due to earth shock does not exceed what can be taken up by the expansion joints and connecting ducts. Water contaminated with radioactive material, chemical and biological agents must not be able to penetrate the shelter.

*Reprinted from Zivilverteidigung, Germany, and The Journal of The Institute of Civil Defence, United Kingdom.

Civil defence related costs of the two deep shelters were met by Government subsidies. The amount of the subsidies is determined by deducting from the cost of the completed shelter an amount representative of the cost of comparable shelters in the same neighbourhood. The difficulty lay in determining with sufficient accuracy the cost of new building in relation to older shelters. For these two large shelters the cost per person amounted to DM 2,415 and DM 2,304.

Hamburg also led the other cities in the Federal Republic with pioneer work in large shelters in the underground railway system. The positive approach of the city of Hamburg was directed not only to the repair of bunkers but also to the provision of multi-purpose buildings.

By 1968 the Jungfernstieg station had been chosen as the first project. Here, in a most complicated construction, the underground line U1 crosses the new line U2 (which runs from Gaensemarkt, roughly parallel to Moenckebergstrasse, to Hamburg North station) and the City S-line (which passes under the Binnenalster). The ticket office lies above the platforms for these three lines and serves as a shelter for 2,000 persons. The rooms for the technical plant and installations were built to one side and the risks to occupants reduced by the use of safety glass in the kiosks, etc. Heavy water-tight doors protect the shelter against flooding by the Binnenalster.

A further large shelter for 4,500 persons was completed in 1975 at Stadthausbruecke station on the City S-line (which runs from the main station via the landing stages to Altona). In a model solution, the platforms and tracks (stationary trains) were brought into use as accommodation. The technical rooms for ventilation, etc., were built above entrance areas. Thus there is a maximum of cover against conventional weapons above the accommodation proper.

The plans are complete for 4,500 shelter places under the Reeperbahn station and construction has already begun. The arrangement of the technical rooms there promises to be even more efficient than in the previous example and well worth copying elsewhere.

The Harburg-Mitte station on the City S-line, with shelter spaces for 5,000 is at the planning stage.

Contractual agreements with the Federal Government provide the basis for subsidies. Since 1971 a system of flat rates per person which have

improved on the previous calculations and may be increased as building costs rise. The flat rates cover all additional civil defence costs, including those for the equipment and the inconvenience caused by the presence of shelters.

A total of 20,000 long-stay shelter places in deep garages and underground stations are completed, in the process of construction or out to contract.

Recently thought was given to the possibility of using existing underground stations for civil defence purposes and thus increase, at relatively little cost, the number of short-stay shelter places. A rough check showed that, of the 80 stations of the Hamburg underground system, 35 underground and 30 surface stations were suitable. What required to be done to provide shelter places in these stations? Firstly, all openings to the outside air, entrances, air vents, etc., could be closed by gas-tight gates or flaps. This would prevent the entry of chemical and biological agents or fallout. To guard against damage to the flexible seals of these closures, it would be necessary to cover them with asbestos strips. If pressure closures, rather than gas-tight closures, are chosen in order to afford protection against the blast from near misses by conventional weapons, protection is also given, although at a greater distance, against nuclear bursts. Current building specifications call for the gates and adjacent free-standing walls to have a pressure resistance of between 0.5 and 1.0 kp/cm² and doors, one of 3.0 kp/cm². The installation of air-locks would hardly be possible and would certainly be too costly. However, wicket gates could be provided in the main closures, which should be constructed as sliding doors at stairs or where entrances are narrow.

By planning to locate gates and closures at the foot of stairs to the platforms, they could be brought in by train. This arrangement would tend to provide the best possible cover in the area of the platforms and tracks and further protection could be provided by the siting of expansion chambers beyond the gates. Depending on the thickness of the roof, cover, etc., protection would be given against initial radiation, fallout, heat radiation, incendiaries, shrapnel and debris for an occupation the length of which would depend on the volume of air present.

It is no exaggeration to say that the plans for large shelters on the City S-lines are an example

(Continued on page 20)

THE SOVIET CIVIL DEFENSE SHELTER PROGRAM

by

Léon Gouré*

This is a report that was prepared for the United States Defense Civil Preparedness Agency, Department of Defense, under Contract DAHC 20-70-C-0309, as a part of an ongoing study of the Soviet civil defense plans, programs and activities, undertaken by the Center for Advanced International Studies, University of Miami.

The purpose of this report is to provide a description of the Soviet shelter program in the 1970's, with particular emphasis on recent developments, and to update and expand earlier studies which have been prepared by the author for the Defense Civil Preparedness Agency. The study is based entirely on open Soviet sources.

This report has been reviewed in the Defense Civil Preparedness Agency and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Defense Civil Preparedness Agency.

Summary

An analysis of Soviet source material indicates that the Soviet authorities have devoted great attention to shelter construction since the inception of the shelter program in the 1950s. By the early 1960s, a considerable shelter capability had been achieved in industry, public buildings, schools, institutes, and new apartment buildings, as well as in the subways in Moscow and Leningrad, which U.S. observers in the Soviet Union learned to identify in 1962. In the 1960s, while shelter construction continued at industrial enterprises and public buildings, the Soviet authorities decided that it was too costly and difficult to provide the entire urban population with blast shelters and came to rely primarily on pre-attack urban evacuation as the method for protecting the population. In the 1970s, however, the Soviet civil defense program has again focused on shelter construction, with the stated aim of providing shelter protection for the entire population in the event that there is insufficient time to carry out the evacuation. Soviet sources indicate that this program is being implemented in urban as well as rural areas.

The Soviet shelters vary according to their purpose, hardness, and the sophistication of the filter-ventilation systems, as well as suitability for long-term occupancy. Soviet shelter types include extra-hard, multistory underground bunkers for use as government and military command posts and for the protection of the elite; multistory basement or large detached shelters for use as production facilities by defense-related industries and in conjunction with party, government and military headquarters; basement and detached shelters for protection of personnel in industry, public buildings, schools and institutes and large apartment buildings; hasty blast shelters in cities to supplement permanent protective structures, and various types of simple fallout shelters in rural areas, which are equipped with simple sand-gravel filters. High quality concrete with a compression ratio of 5,680 psi to 7,100 psi is used in the construction of permanent shelters. Basement shelters have heavily reinforced concrete roofs, 1-3 feet thick, usually supported by pillars 18 feet apart, and walls 2-4 feet thick. Hasty blast shelters are often built of prefabricated reinforced concrete blocks, 2-3 feet wide and high, and 5-6 feet long, which are placed in excavations and covered with 2-3 feet of earth. According to Soviet sources, depending on the purpose and location, the basement shelters are hardened for 1-10 kg/cm² (i.e., 14.2-142 psi) blast over-pressure and provide a radiation attenuation factor of 1,000. Hasty shelters are hardened to 28.4 psi, with a radiation attenuation factor of up to 550. Shelter capacities in basement and detached shelters range from 50 to 1,000, and much more in the case of subways or adapted mines. Considerable interest is shown in dual-purpose shelters for use in peacetime as under-

*Leon Gouré is a Professor of International Studies and Director of Soviet Studies at the Center for Advanced International Studies at the University of Miami. A graduate of New York University, Columbia University School of International Affairs and Russian Institute, and Georgetown University, he is the author of *Civil Defense in the Soviet Union*, *The Siege of Leningrad*, *Soviet Civil Defense 1969-70* and *War Survival in Soviet Strategy: USSR Civil Defense*. He has also co-authored *Soviet Strategy for the Seventies: From Cold War to Peaceful Coexistence*, *the Role of Nuclear Forces in Current Soviet Strategy* and *Soviet Penetration of Latin America* among others.

(Editor's Note: The chapter "Characteristics of Soviet Shelters" amplifying construction details referred to in this summary have been omitted in this reprint)

ground garages, restaurants, laboratories, and manufacturing. Use is also made of adapted underground pedestrian walkways and transportation tunnels.

While permanent shelters are equipped with filter-ventilation systems, sometimes supplemented with air regeneration units and bottled oxygen, reserves of drinking water and toilet facilities, only industrial or shelters for the elite are provided with a prestocked supply of food. The lack of such food reserves in apartments, schools, institutes and other shelters will limit the time of occupancy. Generally, the Soviet shelter system appears to be planned for an occupancy of one to five days, since it is expected that the occupants will be rescued and evacuated to safer areas in this amount of time following an attack.

Soviet sources indicate that the amount of ready shelter space is growing, both as a result of the compulsory addition of shelters to new buildings, and as a result of compulsory construction of hasty shelters during the course of the comprehensive exercises which have been held since 1973 throughout the USSR. Despite Soviet public attempts to deny the significance of the Soviet civil defense program for the U.S.-USSR strategic balance, leading Soviet spokesmen admit publicly at this time that "methods of protecting the population and the national economy against attacks" are "constantly being improved."

Introduction

According to Soviet civil defense spokesmen, "the sheltering of the population in protective structures is one of the important methods of protection against the casualty-causing effects of weapons of mass destruction,"¹ i.e., nuclear, chemical and bacteriological weapons. Indeed, not only do Soviet authorities assert that "the preparation of shelters is a matter of great importance for the state," but they make clear that the protection of essential elements of the population and of industry is a fundamental requirements for the successful waging of a nuclear war and the attainment of victory.² The priorities attributed to shelters in the post-World War II Soviet civil defense program have fluctuated, depending in large measure on Soviet investment capabilities. It is evident, how-

ever, that in the 1970s the shelter construction program has been moved to the fore as the main method for protecting vital production and the population in the event of a sudden outbreak of a war or a rapidly escalating crisis. This increased emphasis on shelters appears a logical development, given Soviet reliance on a first counterforce strike strategy and the leadership's desire to be able to cope with a rapidly escalating crisis which would not provide sufficient strategic warning to implement more time-consuming civil defense measures.

Soviet Views on the Need for Shelters

Shelters have been a part of the Soviet civil defense program from its inception in 1932. While during World War II the population used simple bomb shelters, i.e. basements and slit trenches, more elaborate facilities had been built for the elite, in particular, the adaptation of several subway stations and tunnels in Moscow for the use of the leaders in the Kremlin. Immediately after the war a debate took place over the utility of shelters as a means of protection against nuclear weapons. It is reported that "the use of shelters was questioned and it was suggested that they did not meet modern requirements."³ This view, however, was judged to be "extreme," and the decision was made for the MPVO, or Local Anti-Air Defense, as the organization was then called, to develop a shelter program for protection against nuclear weapons effects.

Major attention was paid to shelter construction in the 1950s. The MPVO specified at that time that the protection of the population "from all means of attack from the air" was to be achieved in "structures specially built or adapted for this purpose," i.e., detached and basement shelters in factory, public and apartment buildings, as well as subways and other existing underground structures.⁴ In the 1950s all plans for new buildings required the approval of the MPVO authorities, and all industrial or large buildings were required, as a rule, to be equipped with shelters.⁵

By the early 1960s there was a good deal of hard evidence that a considerable amount of shelter space in factories as well as public and apartment

¹M. N. Titov, P. T. Egorov and B. A. Alabin, *Grazhdanskaya Oborona*, (Moscow: Vysshaya Shkola, 1974), p. 33.

²See Leon Gouré *War Survival Soviet Strategy: USSR Civil Defense*, Monographs in International Affairs (Coral Gables: Center for Advanced International Studies, University of Miami, 1976), *passim*.

³Lieutenant-General G. Malin, *Sovetskaya Rossiya*, June 5, 1968.

⁴*Uchebno-Metodicheskoe Posobie po Provedeniiu Trenirovok i Priemu Norm "Gotov k PVO" 1-i Stupeni* (Moscow: DOSAAF, 1959), p. 32. See also, Colonel-General A. T. Altunin, "Principal Stages and Directions of Development of USSR Civil Defense," *Voenno-Istoricheskii Zhurnal*, No. 11, November 1976, pp. 39-47.

⁵Gouré, *Civil Defense in the Soviet Union* (Berkeley: University of California Press, 1962), pp. 79-110.

buildings had been built, and that the Moscow and Leningrad subways had been equipped with concealed blast doors at the entrances to the station platforms and in connecting crosswalks.⁶ An ongoing debate in the U.S. at that time concerning the existence of a Soviet civil defense program was largely resolved when, in 1962, U.S. military attaches and newsmen visited the Permanent Civil Defense Exhibit in Moscow and learned how to identify the telltale external features of Soviet shelters, namely their emergency exits, which are normally located at some distance from the building housing the shelter. Commenting on his visit to this exhibit, *New York Times* correspondent Seymour Topping reported in March 1962:

The above ground extensions of shelters now identifiable have been found to be numerous in Moscow. Travelers have seen them in other Soviet cities too. . . . These installations can be seen in the courtyards at various distances from public buildings.⁷

Similarly, the *Reuters* correspondent wrote that

The exhibit showed that in a construction program after the war an extensive system of shelters in basements of office and apartment buildings was laid out.⁸

At the same exhibit, the correspondents learned to recognize the concealed blast doors in the subways, being shown a Soviet film which revealed how "steel doors would be lifted into place by hydraulic jacks to seal off arched entrances to the platforms."⁹ Unfortunately, with the rotation of U.S. Embassy personnel and newsmen, the knowledge of how to recognize Soviet shelters was subsequently lost by Americans stationed in Moscow.

Despite extensive shelter construction during this period, the authorities came to recognize that the effort to provide effective protection against "all casualty-producing effects" of nuclear weapons for the entire population in high risk areas was slow and costly. Consequently, in the late 1950s it was decided to rely primarily on pre-attack urban evacuation and dispersal as the best means for protecting the majority of the urban residents, and to give priority in shelter construction to those essential workers and employees who would be required to remain in the cities in order to maintain vital industrial production and services, as well as for the political, administrative

and military elite.¹⁰ Thus, while shelter construction continued in the 1960s, and spokesmen claimed that the Soviet leadership was devoting a great deal of attention to it,¹¹ it was also said that

To create them for the entire population of the country requires enormous resources and many years of intensive work. As yet, this is not within the capability of any, even the most developed country, to do.¹²

A thorough reassessment of the Soviet civil defense program was undertaken in the early 1970s, resulting in a major shift in Soviet views on requirements for shelters. The USSR Chief of Civil Defense, General of the Army A. T. Altunin, who had been appointed to that post in 1972, announced in November 1973 that "decisive changes have taken place with regard to maximum use of all available engineering structures in the interest of protecting the population."¹³ The following year Altunin explicitly called for USSR civil defense "to be constantly prepared to shelter the entire population in protective structures."¹⁴ (See following article "The Main Direction")

Soviet spokesmen have advanced various explanations for this shift in emphasis to shelters. Altunin himself has pointed to the increase in "the accuracy of delivery of nuclear weapons" and in their yields, and asserted that "the task of civil defense is to raise to the maximum the reliability of the protection of the population from the first hour of a war under any conditions of its initiation,"¹⁵ i.e., under conditions where there would be insufficient warning to carry out the pre-attack evacuation of the cities. Therefore, Altunin argued that the construction of such shelters, which he acknowledged to be a "difficult task," was essential, and presumably no longer too costly or impractical. Altunin also claimed that the earlier primary reliance on the evacuation of urban residents had been forced upon Soviet civil defense by the lack of sufficient "reliable shelters" and the long lead time required to build them in large

¹⁰Altunin, "Principal Stages," *Voenno-Istoricheskii Zhurnal*, No. 11, November 1976, pp. 43-44; Marshall of the Soviet Union V. I. Chuikov, *Grazhdanskaia Oborona v Raketno-Iadernoi Voine* (Moscow: Atomizdat, 1968), p. 16.

¹¹Chuikov, *Izvestiia*, June 15, Gouré, *Soviet Civil Defense Revisited 1966-1969*, The RAND Corporation, RM-6113-PR, November 1969, pp. 22-27.

¹²V. A. Beliaevskii, *Grazhdanskaia Oborona, Vsenarodnoe Delo* (Moscow: Atomizdat, 1968), p. 9. See also M. V. Kachulin, *Beseda s Naseleniem o Grazhdanskoi Oborone* (Moscow: Atomizdat, 1970), p. 32.

¹³*Sovetskii Patriot*, November 21, 1973.

¹⁴Altunin, "Important Aspect of Training," *Uchitel'skaia Gazeta*, August 22, 1974 [emphasis added]; and in *Liudi i Dela Grazhdanskoi Oborony* (Moscow: Voenizdat, 1974), p. 9.

¹⁵Altunin, *Liudi i Dela Grazhdanskoi Oborony*, p. 9.

⁶*Ibid.* See also Gouré, Testimony before Subcommittee No. 3 of the Armed Services Committee of the House of Representatives, June 17, 1963.

⁷*The New York Times*, March 23, 1962. [Emphasis added.]

⁸*Washington Post*, March 25, 1962. [Emphasis added.]

⁹*The New York Times*, March 23, 1962.

numbers, but he suggested that this situation had changed and that it had become possible now to shift the emphasis to shelters for everybody.¹⁶ Other Soviet spokesmen argued in 1975 that an enemy might attempt to deliver pre-emptive strikes on the Soviet Union or carry out a surprise attack, and that there might not be sufficient time to implement the evacuation of urban residents.

Now, when there has been further development and improvement of nuclear missiles and strategic aviation, in case a war breaks out the aggressor may attempt to deliver a forestalling nuclear attack. . . . Under these conditions, the time period for performing protective civil defense measures may be extremely limited, especially those for carrying out dispersal and evacuation. Consequently, today a plan for sheltering the population in protective structures has been brought to the fore as the most reliable one for saving the lives of peoples from nuclear missiles.¹⁷

Soviet officials told the same story to Finnish civil defense officials during the latter's visit to the Soviet Union during the summer of 1973. According to one of these officials:

In recent years ever-increasing attention has also been paid to shelter protection. Consequently, after 1970, the construction of shelters has increased and the design of radiation shelters and construction of prototype shelters are carried out at present over all the country.¹⁸

The increased emphasis on shelters is reflected also in the activity reports of local civil defense chiefs. For example, the Chief of the Civil Defense Staff of the Lithuanian Republic wrote in 1974 that in the city of Vil'nius "the tasks of constructing dugouts and shelters for workers and employees are being successfully carried out in many of the city's plants."¹⁹ The Chief of the Civil Defense Staff of the Uzbek Republic asserted that "the main attention will be devoted to the construction of shelters and various covers."²⁰ The Chairman of the Executive Committee of the Baku City Soviet (i.e., council) wrote that "the question of the construction and maintenance of protective structures has become especially important."²¹ It was reported that in the Turkmen Republic "par-

ticular attention was paid to the organization of the population's protective facilities [i.e., shelters], the keeping in readiness of existing shelters and covers and those under construction."²² It was noted in the Kirgiz Republic that "a great deal of attention is being devoted to the construction of shelters."²³ In November 1976 the Chief of the Lithuanian Civil Defense Staff declared that "as in previous years, principal attention was paid to the building of protective structures."²⁴

The increased focus on shelters in recent years does not mean that urban evacuation and dispersal have been dropped from the Soviet civil defense program. As is noted in a 1975 civil defense manual, "the greatest effect in the protection of the population is achieved by combining the methods of [protection in] shelters with dispersal and evacuation of people to safe areas in the out-of-town zone."²⁵ Indeed, Soviet publications continue to report further work on evacuation plans and the preparation of rural areas to receive and shelter evacuees, the holding of evacuation exercises in various parts of the Soviet Union, and the instruction of the population in evacuation procedures.

Improvements in evacuation procedures parallel the increased emphasis on shelters. In 1973 the Soviet authorities introduced a program of evacuation on foot of "a significant portion of the urban population . . . in organized columns, according to the appropriate schedule and along pre-planned and previously prepared routes,"²⁶ and they have dropped the earlier requirements for the pre-departure registration of, and the issuing of passes to, evacuees,²⁷ in order to accelerate the rate of evacuation and solve the transportation problem.

The willingness of the Soviet authorities to invest in a greatly expanded shelter construction program indicates not only the importance which they attribute to civil defense in general as a part of the overall Soviet defense and war-fighting posture, but also a decision to increase the flexibility of Soviet civil defense capabilities, so as to be prepared for war under any condition of its initiation.

¹⁶Altunin, "Principal Stages," *Voenna-Istoricheskii Zhurnal*, No. 11, November 1976, p. 45.

¹⁷K. G. Kotlukov, K. S. Oglobin, and A. I. Sgievskii, *Grazhdanskaia Oborona Vchera i Segodnia* (Moscow: Atomizdat, 1975), cited in JPRS, *Translations on USSR Military Affairs*, GUO 32/76, July 8, 1976, pp. 19-20.

¹⁸Erkki Mantyvaara, *Vaestösuogelu Lehti* (Helsinki), No. 2, 1974.

¹⁹Major-General S. Stalaukas, "To Improve Civil Defense," *Kommunist* (Vil'nius), No. 11, November 1974, p. 73.

²⁰Major-General S. Akhundzhanov, "Each of US Must Know How and Be Able To," *Pravda Vostoka*, February 21, 1975.

²¹A. Mamedov, "To Learn to Lead," *Voennye Znaniia*, No. 8, August 1974, p. 22.

²²N. Lysov, "In the Civil Defense Organization," *Turkmenskaia Iskra*, June 12, 1974.

²³M. Fakhrutdinov, "Formation of a Defense Fund," *Sovetskaia Kirgiziia*, July 27, 1976.

²⁴Stalaukas, *Radio Vil'nius*, November 26, 1976.

²⁵Kotlukov, et al., *Grazhdanskaia Oborona Vchera*, p. 20.

²⁶*Ibid.*

²⁷Colonel A. Zaitsev, "The First Lessons: The Time Has Come to Glean Them from Complex Exercises Already Held at Production Facilities," *Voennye Znaniia*, No. 6, June 1976, p. 18.

Soviet Views on Duration of Shelter Occupancy

While noting that in the U.S. planning for shelter occupancy may be as much as two weeks, Soviet doctrine does not prescribe a general fixed duration of occupancy.²⁸ Instead, it is said that "the duration of stay in blast or fallout shelters depends on the rate at which local radiation declines."²⁹ In essence, Soviet doctrine envisages the earliest possible transfer of shelter occupants to nearby undamaged buildings or their evacuation to safe areas, taking into account that the permissible one-time dose of exposure to radiation should not exceed 50 rads.

According to Soviet instructions, the area of radioactive contamination is divided into three zones: the zone of light radiation, or Zone A, where at the outside border line the level of radiation is 40 rads and the dose rate one hour after the nuclear detonation is 8 rads per hour, and after 10 hours is 0.5 rads per hour; the zone of "strong" contamination, or Zone B, where the outside border line has a radiation level of 400 rads and the dose rate one hour after the detonation is 80 rads per hour and after 10 hours is 5 rads per hour; and the zone of "dangerous" contamination, or Zone C, where at the outside border line the level of radiation is 1200 rads and the dose rate one hour after the detonation is 240 rads per hour and after 10 hours is 15 rads per hour.³⁰ It is said, therefore, that people in Zone A will be able to leave the shelters in ten hours and return to their homes,³¹ but should not leave the latter for more than four hours during the first day. In Zone B people should remain in the shelters up to three days and then not leave their homes for more than three-four hours a day for the next few days. In Zone C, people will remain in the shelters for three to five days.³² Soviet manuals note, however, that at a radiation rate of 240 rads per hour one hour after the detonation, it will require a week for the rate to decline to a level of 0.6 rads per hour, and that a rate of 610 rads per hour one hour after the detonation will require four weeks to decline to a level of 0.4 rads per hour.³³

The length of time that individuals will be able to remain in the shelters will depend on a number of factors. A critical question affecting the duration

of shelter occupancy will be whether the external water and sewage systems are destroyed. If they are destroyed, shelter occupants will depend on the reserve water supply and septic tanks in the shelter, which are likely to be adequate for only a short time, i.e., only a few days at most. The reserve facilities in permanent shelters of industrial enterprises required to maintain production in wartime, and in command posts and shelters for the elite may be better, but it is doubtful that they would suffice for more than two weeks of occupancy. Of course, where external water and sewage systems are not destroyed and the shelters are equipped with water wells, the duration of occupancy would not be similarly restricted.

Another factor which may limit the duration of shelter occupancy is the availability of food reserves in the shelters. There appears to be no uniform requirements for maintaining specific amounts of food stocks in the shelters. Soviet manuals indicate that basement shelters in apartment buildings are not normally prestocked with food. Civil defense instructions to the population specify that when taking cover in such shelters the people should take along a three-day supply of food. It is possible, however, that if time permits, additional food may be stored in such shelters.³⁴ The same problem faces persons taking cover in the subways, tunnels, underground pedestrian walkways, and so on. In the case of shelters in factories and large institutions, the food problem appears to be solved by making use of supplies belonging to the canteens and restaurants of the factories or institutions. This is especially true in the case of shelters designed for long-term occupancy, which are said to be provided with reserves of food.³⁵ For example, in the course of a large scale shelter exercise in the town of Lytkarino, near Moscow, it was reported that "the workers and employees" took cover in shelters which had been provided with "a long-term supply of food and drinking water."³⁶ As was noted, it is also recommended that some food and water be stored in fallout shelters, which would be easiest to do in the case of single family shelters, but less practical in the case of public shelters. The limitations on the food supply suggest that even with strict rationing, people in apartment house basement shelters would probably not be expected to

²⁸Krotkov, *Meditsinskaia Sluzhba*, p. 20.

²⁹Sudakov, *Zashchita*, pp. 55-56.

³⁰Titov, et al., *Grazhdanskaia Oborona*, p. 25.

³¹Krotkov, *Meditsinskaia Sluzhba*, p. 20. According to Titov, et al., p. 68, people should remain in the shelters "up to one day."

³²Titov, et al., *Grazhdanskaia Oborona*, p. 68.

³³Egorov, et al., *Grazhdanskaia Oborona*, p. 82.

³⁴Krotkov, *Meditsinskaia Sluzhba*, p. 111.

³⁵*Ibid.*; F. Il'iasov, "When Acting with Self-Assurance," *Voennye Znaniia*, No. 11, November 1976, p. 26.

³⁶Captain V. Zhitarenko, "Civil Defense Readiness," *Krasnaia Zvezda*, January 21, 1976.

remain there for more than five days. The maintenance of discipline in the shelters in regard to food and water is one of the responsibilities of the civil defense shelter teams.

In assessing Soviet views on the likely duration of shelter occupancy, it should be kept in mind that one of the primary functions of the massive post-strike operations of Soviet civil defense forces is the rescue and evacuation of persons in surviving shelters in the zone of nuclear damage. Such operations will include efforts to decontaminate passages into the disaster area and to the shelters. Of course, the actions of the rescue teams themselves will be constrained by the existing levels of radiation. It also appears that, as in the case of other Soviet civil defense measures, so in the matter of capabilities for long-term shelter occupancy, the authorities clearly favor those elements of the population which they believe to be most valuable to the state.

Shelter Construction and Availability

There is good evidence indicating that, since the 1950s, the Soviet Union has built shelters in conjunction with the overwhelming majority, if not all, industrial enterprises, including those producing consumer goods, and that a great many shelters have been built in public, office, and communist party buildings, schools and institutions of higher learning, research facilities, stores and apartment buildings. It seems highly probable that there is ready shelter space for at least one work-shift at most or all industrial enterprises. The Soviet practice of digging deep foundations and constructing basements in multistory buildings greatly facilitates the construction of shelters or the conversion of basements into shelters. The evidence indicates that in the 1970s, if not before, the earlier rule requiring the approval by civil defense staffs of all construction plans and the compulsory construction of shelters in new factories, offices buildings and large apartment houses has been reestablished.³⁷

Soviet publications mention the existence of shelters in all parts of the Soviet Union. These include not only large cities, but also smaller towns and collective or state farms. For example, the issues of the monthly journal *Voennye Znaniia* for the year 1976 mention shelters in thirty different localities in the Soviet Union, with addi-

tional ones being reported in the newspapers, such as *Red Star* and *Soviet Patriot*. A detailed description of civil defense activities at the Moscow First State Ball Bearing Plant, published in 1975 in 243,100 copies, reports not only the availability of shelters at the plant but plans for the construction of additional ones for the workers' settlement and during the course of the renovation and modernization of the plant, as well as the building of a "large underground pedestrian passage-shelter," of a vehicular tunnel and underground garage to be used as a shelter; the "adaptation of all available basements in production and residential buildings as shelters"; the construction of underground wells and reservoirs and compressor stations, etc.³⁸ In Moscow construction is in progress on large multi-story underground complexes of stores, warehouses, garages, transportation tunnels and walkways and service areas, which, in all probability, will be adapted for shelter purposes.³⁹ Published Soviet accounts of exercises also report the widespread existence of ready fallout shelters at collective and state farms, in some instances with sufficient space for urban evacuees. Possibly indicative of progress made in developing ready shelter space capacity is the account of an exercise held in 1975 in the town of Lytkarino (population about 40,000) near Moscow, where a test alert in one district with a population of some 14,000 is said to have demonstrated that there was sufficient ready shelter space for everyone.⁴⁰

In order to expedite the availability of ready shelter space, the Chief of USSR Civil Defense, Altunin, urged that advantage be taken of the stepped-up civil defense training program instituted in 1973, in order to build more hasty shelters as a part of the training exercises. He wrote that

In the course of the preparation and execution of complex factory exercises it is *obligatory* to carry out the forced-draft construction of protective structures and training sites.⁴¹

He proposed that these hasty shelters be progressively improved and strengthened, in order to "gradually" transform them "into real permanent protective installations," and that the exercises also be used to carry out the "adaptation of cellars and basements into fallout shelters."⁴² One reason for

³⁷Gromov and Krechetnikov, *Grazhdanskaia Oborona Promyshlennogo Obekta*, *passim*.

³⁸*Pravda*, August 23, 1973; A. Blokhin, "Underground Streets," *Izvestiia*, April 10, 1974.

³⁹*Krasnaia Zvezda*, January 21, 1976; *Sovetskii Patriot*, September 6, 1976.

⁴⁰Altunin, "On the Basis of What Has Been Achieved," *Voennye Znaniia*, No. 10, October 1975, p. 4.

⁴¹*Ibid.*, Altunin, "The Main Direction," *Voennye Znaniia*, No. 12,

³⁷See Colonel V. Postrigan', "The Director Led the Exercise," *Voennye Znaniia*, No. 6, June 1975, p. 36; A. Bogachev, "What Can Be Foreseen," *Voennye Znaniia*, No. 7, July 1975, p. 23.

taking advantage of exercises for this purpose is that the "complex" exercises which are now part of the standard training program are of two or three days' duration, with the first phase usually lasting one day and simulating conditions under a "threat of war" alert, during which the program calls for the construction of hasty shelters to supplement the ready permanent shelters.⁴³ Photographs published in *Voennye Znaniia* of such hasty shelters show them being built of large reinforced concrete blocks in deep excavations.⁴⁴ Soviet descriptions of the exercises frequently mention the construction of such shelters, which the population is taught how to build. The exercises also serve to speed up the completion of shelters already under construction.⁴⁵

Soviet commentaries indicate, however, that the shelter construction program has not been completed at this time. While the number of ready shelters is reported to be increasing from year to year,⁴⁶ Soviet publications cite instances where shelter construction is proceeding very slowly or has been delayed. For example, the First Secretary of a city district committee of Baku, Azerbaidzhan SSR, complained in August 1975 that "at some enterprises" not all is well "in building up the inventory of protective structures and their maintenance."⁴⁷ The Chairman of the Latvian SSR Council of Ministers wrote in February 1976 that "there is no point in concealing the fact that until recently cellars, basements and underground facil-

ities at certain collective farms were not adapted for the protection of the population and food supplies."⁴⁸ The inspection of shelters leased for use as storage or for production reveals instances of violation of the rental terms, resulting in damage to the filter-ventilation units or the blocking of entrances, which would delay the preparation of the shelters for occupancy.⁴⁹ The conduct of the Soviet exercises also reveals that the local civil defense staffs are given advance warning, so that they have time to bring the shelters into a state of readiness before the start of the exercises.

Obviously, the availability of sufficient shelter for the "entire" urban population is not only a question of numbers of shelters, but also of their location, so as to insure that the population can be protected effectively, regardless of the time of day and the movement of people. Altunin indicates that this is a goal of the Soviet civil defense program, but does not set any date for its completion. Even so, indications are that a considerable fund of ready shelter space is presently in existence, and that it is being added to at an accelerated rate. Thus, even while criticizing the concern over Soviet civil defense in the U.S. as a "provocative campaign" and a "propagandistic ballyhoo," Army General A. I. Radzievskii, Chief of the Frunze Military Academy admitted in January 1977 that civil defense "methods of protecting the population and the national economy against attacks" are "constantly being improved."⁵⁰ ▲

⁴³Major-General O. Nikolaiev, "Organizational Principles for Comprehensive Exercises at Installations; How to Prepare for Conduct Such Exercises," *Voennye Znaniia*, No. 3, March 1976, p. 18.

⁴⁴*Voennye Znaniia*, No. 5, May 1975, p. 39, and No. 9, September 1975, p. 21.

⁴⁵Zaitsev, "The First Lessons," *Voennye Znaniia*, No. 6, June 1976, p. 18.

⁴⁶For example, see D. Fanyan, "To Find Support in the Aktiv," *Sovetskaiia Moldaviia*, October 10, 1975; Stalaukas, *Radio Vil'nius*, November 26, 1976.

⁴⁷N. Nadzhafov, "According to a Thorough Plan," *Voennye Znaniia*, No. 8, August 1975, p. 17.

⁴⁸Iu. Iu. Ruben, "Concern for a High Degree of Readiness," *Sovetskii Patriot*, February 4, 1976.

⁴⁹N. Kalinina and P. Gorbunov, "Take Care of the Protective Facilities," *Voennye Znaniia*, No. 8, August 1976, p. 23.

⁵⁰*Literaturnaia Gazeta*, January 19, 1977.

THE MAIN DIRECTION

by

General-Colonel Aleksandr Terentyevich Altunin,
Chief of Civil Defense of the USSR, Deputy Minister of Defense

AFIS/INC COMMENT: The article appeared in the October 1976 issue of Voyennyye Znaniya, a monthly published jointly by Soviet Civil Defense and DOSAAF. The author, General-Colonel Aleksandr Terentyevich Altunin, is a Deputy Minister of Defense and Chief of the Soviet Civil Defense organization. The article contains General Altunin's assessment of progress made in the Soviet Civil Defense program during the past year and detailed plans for the coming year.

In the article General Altunin asserts that, regardless of increasing concern in the West over the Soviet commitment to Civil Defense, the Civil Defense program in the USSR will continue to expand even further. The General stresses the requirement for continuing sophistication in the conduct of integrated installation exercises which involve the increased use of special "instruments, gear and communications and warning equipment."

As in previous annual reports, General Altunin once again calls for continuous upgrading of specialized training programs for each segment of the population and for the continued development of special training facilities. He also reiterates once again the relationship between the Civil Defense program and the Armed Forces of the USSR.

The Soviet people, inspired by the historic decisions of the 25th Party Congress¹, have begun to accomplish the most important tasks of the Tenth Five-Year Plan with tremendous patriotic enthusiasm. High quality work in all spheres of activity has become standard for the national socialist competition. Together with all our people, the servicemen of the armed forces are worthily accomplishing their duty.

The Soviet people recall the words of the great Lenin that while imperialism exists, the threat of aggression will hang over our country and "... we must accompany our steps toward peace with special attention toward our military readiness..." This thought is also expressed in the Summary Report of the Central Committee of the Communist Party of the Soviet Union to the 25th Party Congress: "No one should have any doubt that our Party will do everything to enable the glorious Armed Forces of the Soviet Union, both now and in the future, to have everything necessary to accomplish their important mission — to be the guardian of the peaceful labor of the Soviet people and the bulwark of universal peace."²

¹The 25th Congress of the Communist Party of the Soviet Union, held in February and March of 1976 — Ed.

²The Summary Report was delivered by L. I. Brezhnev, as General Secretary of the Central Committee of the Communist Party.

No matter what our enemies may say and whatever slanderous lies the imperialists may resort to, dredging up the worn-out bugaboo of the "Soviet threat", we are proceeding with a firm tread along the road of further relaxation in international relations, toward the establishment of long-term peace and security for mankind. Civil Defense of the USSR, pursuing a purely humane goal — the organization of protection for our Soviet people and the national economy against modern weapons — despite the hostile voices of international reaction and as long as aggressive military blocs of imperialism exist, will be strengthened even further in the name of this noble goal.

The training year which has just been completed in the Civil Defense system has brought noticeable results in the improvement of practical training methods for the population, non-militarized formations, and military units. It was a year of planned integrated installation exercises, further improvement of the course training for supervisory and command management personnel, and further expansion of the training-material base at installations and in rayons and cities.

By now, no one has any doubts that the practical training course for all Civil Defense forces and the population is the only correct one. Experience accumulated in the past gives us the right to say

that improvement of practical forms and methods of training and further improvement in its quality is not a short-term task, but is the main direction for the development of civil defense. The primary task for the next few years will include a decisive increase in the quality of training in all elements by means of in-depth deductive reasoning and scientific analysis of the experience which has been accumulated. This is being done in the Moskovskaya, Leningradskaya, and a number of other oblasts in the Russian Federation, and in Moldavia, Kazakhstan, Latvia and Lithuania. The primary task also includes the introduction of all advanced measures into civil defense operations, and the improvement of the procedure of conducting special tactical exercises and integrated training. The final results of this great work should be a high state of readiness of labor collectives, staffs, services, and non-military formations for operations under special conditions.³

It seems to us that the decisive element in the entire system of civil defense measures is the training of the supervisory and command-management personnel from top to bottom. When all our personnel have a deep understanding of the state's requirement for civil defense measures and are able to accomplish any task competently and in a methodologically correct manner, then we will be able to say confidently that our civil defense is being improved even more. The Ukraine, Estonia, Belorussia, Moscow, Moskovskaya oblast, Azerbaydzhan, Lithuania, and many oblasts of the Russian Federation where course training of the Party activists, and commanders and political workers of formations is being conducted systematically, can serve as examples. Here experience is being subjected to deductive analysis; the forms and methods of Party-political work and of moral-political and psychological training in the civil defense system are being analyzed.

Our numerous activists can and should be trained not only in civil defense courses, but also directly at enterprises and in kolkhozes, sovkhozes, institutions, and departments. Furthermore, the installation⁴ was, is, and will be the center for the training of cadres of the supervisory and command-management personnel of the local unit. At

³"Operations under special conditions" is a euphemism for operations in an environment where nuclear or CBR weapons have been used — Ed.

⁴In Soviet parlance, an "installation" can be an industrial enterprise, collective farm (kolkhoz), state farm (sovkhoz) or training institution.

the installation, during integrated exercises, special tactical lessons and exercises, classroom group and practical lessons, staff drills, and command-post exercises — as well as during the practical training of the labor collective and non-military formations — supervisory and command-management personnel learn to control the civil defense personnel and equipment used during rescue and urgent emergency repair work in stricken areas, taking into account the special and specific features of their installation. Supervisors learn what they must do under special conditions at that installations for which any one of them bears personnel responsibility.

In training his subordinates, the supervisor himself also learns. He discloses shortcomings, finds ways to eliminate them, displays initiative and sharpness, and increases his self-discipline and responsibility for the accomplishment of civil defense missions. In this case, the courses are intended to train an installation supervisor and to teach him the procedure for accomplishing the primary missions of civil defense and for preparing and conducting integrated exercises. Still further upgrading of his knowledge, practical skills, and especially of his methodological skill should take place at the installation during the course of his daily work.

The methodological skill of the supervisor, perhaps, is now the basic concern in his training. In this connection, we cannot fail to mention the training methods meetings of supervisory and command-management personnel which we should conduct prior to the start of the new training year in the Civil Defense system. In the past, in several places, they took place after a delay and at times at a low methodological level. Many people assembled for such sessions and were led through the various points of a demonstration exercise but the trainees did not receive what was most necessary. The practical portion was poorly organized and in a stereotyped manner. It is necessary to make changes in this matter. If an integrated demonstration training exercise is conducted, it must be done so that civil defense chiefs and other supervisory personnel, as the future leaders of exercises, receive the maximum methodological knowledge and skills. They should learn how to develop a training plan and other documents correctly, train their deputies and assistants, organize the work of the staff and services, control the forces, and so forth.

The sectional method for the conduct of assemblies whereby trainees are divided into appropriate groups (civil defense chiefs, chiefs of staffs, commanders and political workers of formations, and so forth) could render good assistance in instilling these qualities. Practical lessons, group exercises, and drills in the subjects connected with the procedure for conducting one or another training measure are organized in such assemblies.

It is not by chance that we devote such attention to problems of procedure. As long as all the basic personnel have not mastered methodological skills, it is difficult to expect an improvement in the quality of training. The methodological training work of civil defense staffs and courses should now be subordinated to this very problem. Really, it is now time to create methodological training centers at installations; civil defense courses will be called upon to render major assistance to this effort.

In connection with this, the necessity both for a further introduction of practical training forms and methods into the training process and for an increase in the number of training periods held directly at installations, shelters, training villages, and training points, (and, in particular, using instruments, gear, and communications and warning equipment) is increasing. It is necessary to vigorously introduce technical means of training, various checking and teaching devices, and special electronic equipment and to make more effective use of motion picture films and film strips. In such a case, it is easier for people to master the training material and they can move on to practical lessons more rapidly.

As concerns the civil defense courses, they continue to remain our main methodological centers for training civil defense supervisory and command-management personnel; it is difficult to overestimate their role in this matter. The point is that integrated training exercises are usually conducted by the civil defense chiefs of the installations themselves, supported by staffs and specialists. This category of command-management personnel needs improvement in its methodological skill and its ability to train subordinates confidently and in a businesslike manner.

Training for installation civil defense chiefs, and their deputies and specialists, ought to be planned so that they all receive training (the civil defense courses) during a three year period. It is necessary that they be trained before integrated

training exercises are conducted, and that they continue to improve their knowledge and ability at the installations during the course of commanders' training, staff drills, and command exercises. We must continue to improve the work of civil defense courses in rayons, cities, oblasts, and republics with still greater persistence. The fact that base installations have been assigned to the courses and a firmer training-material base is being established makes this task easier. Measures are being taken for the further improvement of the methodological skill of the teachers and masters of production training. In the new course program, more time is allotted to the study of procedures, especially on the preparation of planned integrated exercises.

Integrated exercises have been and continue to be the core of training at any installation, whether it be an industrial enterprise, kolkhoz, sovkhoz or training institution. These integrated exercises involve not only integrated planning in accordance with the already developed civil defense plan (which, unquestionably, is valuable); they also involve methods in training various categories of the population. Thus practical lessons on putting shelters in proper order, preparing very simple individual protective means, making production premises and residential buildings airtight, and so forth predominate in the training of workers, employees, that part of the population not engaged in production or services, pupils, and students. It is important that they acquire practical skills in defense against modern weapons. Supervisory personnel, specialists of installations and civil defense staffs and services improve their ability both to control production and conduct measures for stable operation of the installation — during preparation for and conduct of exercises.

Military units and non-militarized civil defense formations participate in tactical and special exercises during the course of integrated exercises. They make wide use of training villages, natural areas, and so forth.

Labor collectives which conducted planned, integrated installation exercises in the past training year reinforced the knowledge and skills which they obtained earlier in a firm manner. Meanwhile the installations as a whole accomplished many additional measures for raising their readiness to operate under special conditions.

Political work was also improved in these cases. In the preparation for and actual conduct of inte-

grated exercises, emphasis was placed on the moral-political and psychological tempering of the personnel of the non-militarized civil defense formations and the population. It is very important that even in the planning stage provision be made for a situation which would help to instill a high level of activity, initiative, bravery, endurance, and ability to endure prolonged physical and mental stress in all exercise participants. The experience of joint mass-political work in the civil defense formations and in the troop units which participate in such exercises deserves special attention and wide propagation.

Without a genuine training-material base which meets modern requirements it is impossible to speak of any decisive steps toward the improvement of civil defense training for the population; this is patently obvious. For this very reason, plans for the creation of a training-material base were worked out everywhere. Work for the new training year should be planned so that these plans can be unconditionally accomplished. The experience of leading rayons, cities, and installations in a number of oblasts of the Russian Federation, Kazakhstan, the Ukraine and Georgia confirm that, if serious attention is devoted to this, high-quality training villages can be constructed quickly, good classrooms can be created for the courses, shelters can be adapted for training points, natural sectors and training sites can be created, and elements which are part of the training-material base system for the courses can be brought to an exemplary state.

I should like to say a few words about teaching civil defense in educational institutions. Great attention has always been and continues to be devoted to the training of the younger generation in defense against modern means of armed conflict. Clearly, these future commanders of production and supervisors of kolkhozes and sovkhozes, institutions, and departments should be comprehensively trained. Interesting experience in this regard has been accumulated in Kazakhstan, Moldavia, and Latvia. The value of this experience lies in the scientific approach to problem solving. For example, see how the problem of improving the quality of teaching civil defense in the secondary educational institutions of Moldavia was solved.

Under the direction of the Party organs, they studied the state of affairs in all educational institutions of the republic and for this purpose they called on Soviet and Komsomol personnel, the

broad active membership of educators, the State Committee for Vocational and Technical Education, and civil defense activists. Then the collected materials were studied and analyzed, and a republic scientific-practical conference was convened with the participation of responsible personnel from the ministries and the supervisors of institutions and departments. The results of this study were reported at the conference and practical recommendations were adopted for the introduction of the best procedures into all the educational institutions of the republic. Demonstration integrated exercises for the typical general educational school and state farm (sovkhoz) school were conducted.

This start was correctly interpreted by the Chiefs of Civil Defense Staffs in Kazakhstan, Azerbaydzhan, the Ukraine, Tadzhikistan, Lithuania, and other republics. The job now is to realistically put into practice suitable measures, taking into account the local situation, in all republics during the course of the new training year. Attentive study is also merited by the experience gained during the organization of training for school children in Latvia, and during the joint work of civil defense staffs and organs of people's education in the preparation and conduct of integrated installation exercises in the schools of Alma-Ata. These were highlighted in recent editions of the journal *Military Knowledge* (Voyennyye Znaniya).

Last year, much was done in the area of scientific analysis of experience and its introduction into the civil defense system. Many examples can be presented where civil defense chiefs and public organizations and staffs displayed initiative in this matter and thereby made a substantial contribution to the further improvement of civil defense. Thus, in Moskovskaya oblast, very useful research work was conducted on improving the procedure for integrated exercises, on the organization and planning of civil defense in large elements such as rural soviets, on the creation of a training base for the civil defense courses, and on other problems. The experience of this oblast should be widely used everywhere.

A good tradition has been formed of reviewing the results of the training year at meetings of the Party-executive activists. It is believed that this is an important political measure, directed toward the further strengthening and improvement of civil defense. The supervisors of local Party and soviet organizations and civil defense chiefs of installations and rayons speak at such meetings. Obliga-

tions of socialist competition for the new training year are also examined at them. Civil defense days (which are becoming mass reviews of the achievements of civil defense forces — staffs, services, and formations) are often timed to coincide with these meetings. Doubtlessly, the results of the past training year will be summed up at the meetings of such activists and tasks will be assigned for the new training year.

It is important to evaluate the results of the work which has been conducted in a self-critical manner. All of us — civil defense workers — should be guided in our practical activity by the

instructions of L. I. Brezhnev at the 25th Party Congress: "We will proceed correctly, will proceed in the Leninist manner, if, in giving its due to what has been achieved, we concentrate attention on the shortcomings which we have and on the tasks which have not been accomplished."

The Party requires just such an approach to their own activity from all. This should become the chief criterion for the work of the civil defense organs which, together with the armed forces, are accomplishing difficult and important tasks in the defense of the peaceful labor of the Soviet people. ▲

Public Shelters in the Hamburg Region — (Continued from page 8)

for other cities in the Federal Republic. The need for the maintenance and repair of existing shelters was recognised very early in both Bremen and Hamburg. In anticipation that they would be taken over on a satisfactory financial basis, the city of Hamburg declared that it was willing to manage and maintain both the reinstated shelters and the large underground shelters. In the event, the anticipations were realised.

Recently the Federal Government has agreed to bear almost all the maintenance costs of public shelters, except staffing.

When shelters under construction, or for which the contracts have been agreed, are completed there will be 101 public shelters in Hamburg with about 68,000 places. Shelters in schools and Government buildings are included in these figures on the grounds that they, too, can be made available. Thus there is one place in a long-stay shelter for every 25 citizens of Hamburg. By using the existing underground stations this figure could be rapidly increased by the addition of about 50,000 short-stay places. ▲

COMPUTERS IN CIVIL PREPAREDNESS

by

Dean H. Ray

Computer Systems Analyst, DCPA Administrative Services

The tasks of modern civil defense planners require that they collect, organize, store, process, update, and prepare management reports on large, dynamic files of information critical to the protection and future well-being of the American people. This information is used for operational planning and response to man-made nuclear disasters as well as any one of nature's tests of man's endurance — hurricanes, tornadoes, floods, earthquakes, tsunami, storms, droughts.

Civil preparedness planners at national, state, and local levels carry the herculean responsibility of ensuring that information they gather and maintain is accurate, timely, and current. In today's complex society, the task often becomes impossible without the aid of modern electronic computers and data communication systems to transmit, process, store, and retrieve the huge volumes of data collected, particularly at the national level.

In order to provide timely lifesaving support actions, the Defense Civil Preparedness Agency (DCPA) maintains a National Computer Center at Olney, Maryland, co-located with other Federal agencies in the DCPA Region Two underground facility. Stored and processed at this center are vital data on millions of national resources such as population statistics, housing and shelters available, government organizations, communication and transportation networks, medical, fire and sanitation support units, and many other files of data considered critical to providing national leaders with accurate and current preparedness planning tools. The Computer Center also provides support to state and local civil preparedness planners by extracting relevant information from the national data base and providing it to the planners to assist them in managing day-to-day operations of their programs. On the national level, the computers are also used to assist in the conduct of research programs, such as developing damage estimation and assessment methodologies, preparing population relocation plans, designing protective structures, and creating feasible goals for post-attack survival and recovery based upon preattack predictions.

Evolution of the Computer Center

The DCPA Computer Center was established in 1962 as a result of Department of Defense Nuclear Damage Assessment missions placed upon the DCPA. At that time, the DCPA, along with the Office of Emergency Preparedness (later reorganized as the Federal Preparedness Agency and placed under the General Services Administration), and the National Military Command Systems Support Center (later renamed the Command and Control Technical Center), were concurrently seeking approval to acquire electronic computers to be used for emergency preparedness planning and for the development of nuclear damage estimating and assessment systems in support of their individual missions. In December 1962, the Bureau of the Budget (now the Office of Management and Budget) completed its study of the requests and authorized the acquisition of computers for each organization.

An abandoned Nike missile site northwest of Olney, Maryland, was selected as the home of the first DCPA Computer Center because of its proximity to the DCPA Region Two headquarters. The first Computer Center employees were hired in December 1963, and a Control Data 3600 model computer was installed in November 1964. The CDC 3600 computer, a high-speed, scientifically oriented type computer, was selected to provide compatibility and mission backup support to the Federal Preparedness Agency, who also obtained a CDC 3600 computer. As the volume of work at the Computer Center increased, a smaller CDC 3200 was later obtained by DCPA to provide file management and report generation support to the larger computer, which was being used principally for scientific calculations requiring fast internal processing speeds.

Original task requirements placed upon the Computer Center were heavily scientific or mathematically oriented, requiring complex mathematical algorithms and sophisticated computations. Creation of management planning reports occupied only a small portion of the processing time.

However, as more and more applications were developed for computer processing, management planning reports became more critical. As the research programs were implemented and became civil preparedness planning and operational programs, the requirement for scientific development and calculations diminished and management began to recognize the potential value of the computer as a planning tool. This time period of revolutionary management thinking toward automatic data processing was certainly not unique to DCPA; other government agencies and private industry as well were beginning to realize the potential for using the computer for day-to-day planning as well as for "number crunching" mathematical computations.

A New Era

The 1970's ushered in the era of teleprocessing and data communications, whereby the computer's vast capabilities were being provided to users located at remote locations via interactive remote terminals. These terminals, when connected to a central computer by ordinary telephone lines, provide the manager with increased computer-use opportunities. The development of increasing computer capabilities by manufacturers also led to the ability to process several jobs at one time on a single computer — techniques involving multiprogramming, multiprocessing, and timesharing. In addition to performing central processing at the computer site, the new capabilities provide for several remote terminals to be connected at the same time, with each user being serviced immediately by the computer. Each user has the feeling that he alone has control of the computer when, in reality, he may be sharing the equipment with many other users with the same impression. This type of processing is done by modern computers at speeds which the average human finds difficult to comprehend. For example, the average human eye blinks in one-tenth of a second; in that time interval, a modern computer may perform from 10,000 to 1,000,000 internal operations, depending on its individual capability.

One of the most serious deficiencies with modern computer systems lies in the limited operating speeds of the mechanical input and output devices, as well as the extremely limited capabilities of human beings to work with the devices. These limitations often result in the computer's effectiveness being considerably diminished while

having to wait on the comparatively slow input and output operations. Other problems can present themselves when computer data transmission over telephone lines is used — problems such as limited transmission speeds and noise factors which can change or destroy the data as it is transmitted. In addition to these problems, it is obvious that a high-speed computer cannot be made to wait on a human being operating a remote terminal at speeds most likely not to exceed two characters per second. Some of these problems are reduced through the use of capabilities within the central computer to overlap and intermix many, many operations during the same time interval. Obviously, if the computer is waiting for data from some input media (human or machine), it can best be used to do other things while waiting and not sit idle. This capability exists through the techniques described previously, i.e., multiprogramming, multiprocessing, and timesharing.

Plans for the Future

With the capabilities now available on the computer market, the DCPA is currently involved in replacing its existing computer equipment with a new Univac 1100 model computer with teleprocessing capabilities. This equipment will provide DCPA with greatly enhanced processing support to regional, state, and local levels.

Each DCPA regional office will initially be equipped with a CRT (cathode ray tube) visual display terminal with a typewriter-like keyboard, and line printer device. This will provide the capability for speedier "real-time" response to regional and state inquiries to the data base at the Computer Center.

A visual display system to provide national leaders with tabular and map-type data display is also current development. This system will remotely display data processed by the central computer system at the Computer Center. Emergency tabular displays will consist of summary statistical tabulations for the Increased Readiness Information System (a system to compile and analyze key state and local government and public actions in a crisis period), reports on damage to civil resources in the event of an attack, and transattack/postattack operational situation reports of state and local governments. Emergency map displays will consist of presentations showing areas of radioactive fallout and other large-area continuing life hazards plotted over background map data.

The automated display system can provide National Command Authorities with timely situation reports in a matter of minutes as compared to several hours required under the present manual procedures. In the future, the incorporation of remote, automatic blast and fallout sensor input data could further increase the speed and accuracy with which DCPA will be able to prepare and present situation information.

Obviously, any tool is only as good as the use to which it is put. It behooves every civil defense manager and planner to become familiar with the capabilities of electronic computers and teleprocessing. Miniaturization in electronics has brought about lower processing costs, higher speeds, and increased potential for use. In today's society, the computer is rapidly becoming a necessity in fact-finding and decision-making processes. ▲

EMERGENCY PLANNING DIGEST

Index 1977

January-February 1977 Vol 4 No. 1

Earthquake in Guatemala	<i>C. deVille Goyet and E. Jeannée</i>
DCPA Viewpoint	<i>John E. Davis</i>
The ORSEC Plan — France	<i>Jean Grassin</i>
Index 1974-1976	

March-April 1977 Vol. 4 No. 2

Seismic Risk in B.C.	<i>W. G. Milne</i>
New Brunswick EMO	<i>W. G. Sargeson</i>
Predisaster Planning	<i>C. L. Mulford and G. E. Klongan</i>
Proliferation	<i>G. Lindsey</i>

May-June 1977 Vol. 4 No. 3

Planning Guide for B.C.	<i>John Blake</i>
UK Warning & Monitoring	<i>Article</i>
United States C.D. — 1977	<i>Donald J. Mitchell</i>
Swedish Shelter Symposium	<i>R. L. Garrett</i>

July-August 1977 Vol. 4 No. 4

Newfoundland Emergency Assistance Plan	<i>Article</i>
Swiss Civil Defence	<i>Hans Mumenthaler</i>
Disasters and Major Incidents	<i>B. E. Fisher</i>
Survival of Relocated Population	<i>U.S. Study</i>
Food for Evacuees	<i>J. W. Billheimer</i>

September-October 1977 Vol. 4 No. 5

Federal Activities — Floods	<i>J. M. Hoffman</i>
Viewpoints	
Nuclear War — USSR Option	<i>O. C. Boileau</i>
Provocative Campaign	<i>USSR</i>
Nuclear Warfare — Forecasting	<i>R. Beaumont</i>
Shielding the Airwaves	<i>R. B. Cianahan</i>

November-December 1977 Vol. 4 No. 6

Post-Strike Scene-U.K.	<i>Sir Leslie Mavor</i>
Beneath the Surface	<i>G. N. Sisson</i>
Basic Principales of Civil Defence	<i>Dr. U. Eichstadt</i>
Swiss Compulsory First Aid	<i>Article</i>
Nuclear War Life and Death Issues	<i>E. Ulsamer</i>