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Canada

June 1964

EMO

NATIONAL DIGEST

The Role of Civil Emergency Planning in NATO

Alberta Government Telephones

B.C. Emergency Fire Defence Plan 1964—Part II

Civil Defence in Sweden

Severe Tropical Storms

The Harbour Project

Civil Defence—Norway

EMERGENCY MEASURES ORGANIZATION

THE EMO NATIONAL DIGEST

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The EMO NATIONAL DIGEST is published bi-monthly to provide current information on a broad range of subjects dealing with civil emergency planning. The magazine is published in English and French and may be obtained by writing to the Emergency Measures Organization, Daly Bldg., Ottawa.

In addition to publishing articles which reflect Canadian Government policy the Digest may also publish articles by private individuals on subjects of current interest to the emergency measures programme. The views of these contributors are not necessarily subscribed to by the Federal Government.

A/Director: P. A. FAGUY

ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1964

THE ROLE OF CIVIL EMERGENCY PLANNING IN NATO

NATO Unclassified

By A. CIPPICO

The following article was prepared for the EMO National Digest by MR. A. CIPPICO, *Head of the NATO Civil Emergency Planning Office under authority of the Secretary General.*



I HAVE been asked to explain how Civil Emergency Planning is dealt with at NATO level, and I am frankly very happy to do so; I fully understand that for anybody engaged in national planning this question is of real interest.

To appreciate the possibilities, and also the limitations, imposed on NATO civil emergency planning, it should be remembered that the full responsibility for carrying out all measures needed for ensuring, to the extent possible, the survival of populations in a nuclear war lies with the nations themselves. During the past years attempts have been made from time to time to internationalise the responsibility, and therefore also the financing, of certain specific planning projects. In each case, the needed unanimity has not been obtained. This, of course, limits the action which can be taken in NATO. While NATO can and does agree on technical standards, lay down principles, coordinate policies and give general planning guidance to countries, it is in no position to insist on individual nations taking action where they alone are affected, and where heavy financial expenditures or political difficulties may be entailed. Notwithstanding these essential limitations, I believe it is true that the guidance given by NATO during the past years has assisted countries in reaching many concrete achievements. Most countries are indeed making use of NATO guidance in preparing their plans and are following, to the extent that their fiances permit, the recommendations made to them.

The general coordination of civil emergency planning in NATO is carried out by the Senior Committee which is directly responsible to the North Atlantic Council. This Committee meets usually once a year in Paris; its Chairman is the Secretary General and the Deputy Chairman is Lord Coleridge (U.K.), who is also Executive Secretary of NATO. The members of the Committee are the national representatives who are responsible for planning in their own countries.

The first task of the Senior Committee is to review national progress through what is known as the Yearly Review, and to make recommendations to countries. These recommendations, as I have mentioned above, are not mandatory, but they do help national representatives in drawing the attention of their own higher authorities to what has to be done and in what particular fields more progress is essential.

The second task of the Senior Committee is to examine the studies made during the year by its specialised committees, and to give them guidance for their future work. These specialised committees are technical in nature and each deals with a particular field of Civil Emergency Planning, such as Civil Defence, Transport, P.O.L., Communications, Medical questions, Industry and Agriculture.

The committees have a twofold task. In the first place, and in line with guidance received from the Senior Committee, they study those questions which are of common interest to all countries. The aim is to present an agreed study, which may then be used as NATO guidance by national planners in building up their organisation. In the second place, they act as a forum, or clearing house, where countries which have devoted special attention to certain subjects, such as all aspects of nuclear tests, can impart vital information to their colleagues of other nations, which clearly greatly assists and accelerates their work. May I say here that as a European, well old enough to remember the time between the great wars, when each country jealously guarded its own secrets with the idea of using them, possibly, against their neighbours, this new, frank and friendly attitude, made possible by the existence of NATO, never ceases to give satisfaction and reassurance that what has been started is a progressive and continuous action which cannot be undone.

Then there is the Civil Emergency Coordinating Committee. This Committee meets very frequently and

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is in a sense the kitchen where the Senior Committee's day-to-day work is carried out. Besides ensuring proper coordination in policy matters between the technical committees, it prepares, in very close collaboration with the International Staff, the Yearly Review Exercise, screens committee studies or resolutions which must go to Council for urgent approval, and directs all aspects of the organisation and structure of the NATO Civil Wartime Agencies for Supplies, namely the Central and European Supplies Agencies. As Head of the NATO Civil Emergency Planning Office, I act as Chairman of this Committee, its national representatives being members of NATO Delegations in very close contact with their Senior Committee representatives at home.

Finally, all committees have, in the course of time, found it necessary to create a certain number of working groups to deal with particular aspects of their studies. These working groups meet at fairly frequent intervals in Paris and are chaired either by national representatives, or by members of the Civil Emergency Planning Staff, or, in some cases, by the Secretaries of Committees. By this means, a considerable number of subjects can be dealt with in a short time, the recommendations of working groups being ultimately submitted to the parent committees for final approval.

This completes the overall view of the Committee structure of NATO.

As regards the action carried out by the International Staff, this is centred in the Civil Emergency Planning Office, which is responsible to the Secretary General through the Executive Secretary. The main task of the Office is to make a first appreciation of civil emergency problems, to suggest solutions which are then submitted for discussion and, where necessary, modification by the technical committees. It is normally from these initial proposals that, through discussion and successive tailoring, the Committees eventually reach final conclusions.

A second task of the Office is to assist Committees and their Chairmen in all aspects of their work, and this is necessary because Committees themselves only meet two or three times a year and national representatives are usually very busy people who have their own work to attend to in addition. Hence the preparation of documents and related matters are usually left to the International Staff.

In view of the complexity of the problems, which are often of a technical nature, and because of the many fields covered by Civil Emergency Planning, a number of highly specialised technical advisers have been added to the staff of the Office. We have at the moment a Civil Defence Adviser, Mr. Simoneau (France), an Inland Surface Transport Adviser, Mr. Peyremorte (France), a Communications Adviser, Captain Lay (Italy), an Air Transport Adviser, Mr. Biemond (Netherlands), a Medical Adviser, Dr. Goffin (Belgium) and an Adviser on Refugee problems, Mr. Lawrence (USA). Lastly, and because the organization of the Civil Wartime Agencies has now reached a concrete stage, a full-scale Exercise will be held in the Spring of 1965, as a first test of working procedures. In order to assist the International Staff, the Committees and the national planning advisers in the preparation of this Exercise, the Canadian Government has most kindly lent us Colonel G. L. Vincent of the Canadian Army. He has expert knowledge of the running of Exercises in his own country and has proved to be of outstanding value to the Organization.

Apart from the Civil Emergency Planning Office, a special section of the Executive Secretariat provides the Secretaries who assist committees to deal with their administrative work. It is their duty to see that the discussions which take place at committee and working group meetings should not step beyond the broad NATO policies laid down. In certain cases, as I have already mentioned, the Secretaries are also called on to chair ad-hoc working groups. Therefore, although they form a separate body of international officers, Committee Secretaries work in extremely close collaboration with the Civil Emergency Planning Office. At present, Dr. West-Burnham (UK) is head of this section and acts as Secretary to the Senior and Co-ordinating Committees, while Madame Barry Delongchamps (France), Mr. Raynolds (US), Mr. Thiebaut (France) and Mr. Lintall-Smith (UK) look after the remaining committees.

I think there is not much more to add to this very brief outline of NATO Civil Emergency Planning, and I should like to conclude therefore, by saying that I am very happy to notice the very fine spirit of dedication and international comradeship which has grown up in our team. I know that this same spirit is growing wherever men of the many nationalities of our Alliance meet together to work in common towards a common goal. This is one of the great dividends which NATO pays.

NATO,
PARIS XVI[e].

APRIL 1964

A. CIPPICO
Head of Civil Emergency Planning Office

ALBERTA GOVERNMENT TELEPHONES

Emergency Operations Organization

By P. HENRY, *Coordinator Security and Industry Defence*

ALBERTA GOVERNMENT TELEPHONES Emergency Operations Programme was undertaken as a result of an A.G.T. Management decision in September 1961, to provide the capability for maintaining continuity of vital communications during emergencies.

The Management Committee, Trans-Canada Telephone System, at a meeting in October 1962, expressed the desirability of establishing continuity of Emergency Operations Planning by member companies across Canada and issued a memorandum on TCTS policy which reads in part:

"The state of preparedness in which we find ourselves, appears likely to continue for the foreseeable future. The temperature of the Cold War changes from time to time, but the basic conflicts of Capitalist and Communist philosophies are not resolved and we appear destined to live in a period of uneasy balance of power.

Under these circumstances it is important that we carefully assess our role as a communications system in the country's defence and survival operations and to provide for the continuity of service to the extent possible in times of emergency, whether these be the hazards of flood, fire, or other disasters of peace, or those resulting from a state of war.

To carry out these basic responsibilities we must ensure that the employee body is competent, reliable, informed, and ready to carry out its duties under all conditions, and that our communications system is planned, operated, and maintained to provide reliable and continuous service."

A meeting of representatives from Member Companies, Trans-Canada Telephone System in March 1963 concluded that geographical, technical, and administrative considerations would require individual company policy regarding their programme development.

Alberta Government Telephones Emergency Operations Planning had first to consider suitable locations for emergency operations outside the probable target areas of Edmonton and Calgary. The selection of these locations was based on their relative importance as centres of normal communications; Headquarters of War Supplies Agency; ready access by road and rail facilities, centres of industry, protection factor rating of A.G.T. Operations buildings, and the location of these buildings relative to the probable fallout paths from the two probable target areas.

The selection of personnel to staff Emergency Operations locations was based on the functional requirements at the emergency location during the shock phase, to meet not only the requirements of their assigned functions, but to add depth to other phases of the Organization. In this regard, personnel could be assigned or be required to assume additional responsibilities if the requirement existed.

The geographical locations of Alberta Government Telephones Emergency Operations Organization, together with the departmental representation, is shown in the succeeding plan:

R.E.G.H.Q. (Penhold)

GENERAL MANAGER
CHIEF ENGINEER

Responsibilities—Administrative and technical advisors on communications to government during emergencies.

Total Staff 2

Emergency Operations Centre (Red Deer)

MANAGER, OPERATIONS AND ENGINEERING 1

Responsibilities—Responsible to the General Manager for all phases of Emergency Operations which includes the administrative and technical aspects of damage reporting, damage assessment, restoration planning, and facility restoration.

Commercial Department Staff	4
Engineering Department Staff	12
Plant Department Staff	19
Traffic Department Staff	3
Security Control and auxiliary communication liaison	4
Total Staff	43

The Plant Department Staff have been assigned the additional responsibilities of accommodation management, vehicle control, emergency stores, Trans-Canada Telephone liaison and transport messenger service.

Restoration Centres (Vegreville, Red Deer, Lethbridge)

DISTRICT PLANT SUPERINTENDENT 3

Responsibilities—Responsible to the Manager, Operations and Engineering for the coordination of engineering and plant aspects of Damage Reporting/Analysis and Facility Restoration in areas under control of the Restoration Centre.

Engineering Department Staff	3 × 3	9
Plant Department Staff	59 × 3	177
Total Staff		189

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Restoration Centres have the built-in capability and flexibility to undertake all phases of Emergency Operations, independent of the Emergency Operations Centre, if the requirement exists.

Damage Reporting Centres (North)

DRAYTON VALLEY, SANGUDO, WESTLOCK

Staff Responsibilities—To probe into damaged areas and report extent of damage to communications facilities (ex Edmonton) over high-speed order wire to the Vegreville Restoration Centre.

Total Staff 3

Damage Reporting Centres (Central)

OLDS, DRUMHELLER

Staff Responsibilities—To probe into damaged areas and report extent of damage to communications facilities (ex Calgary) over land line facilities to the Red Deer Restoration Centre.

Total Staff 2

Damage Reporting Centre (South)

HIGH RIVER

Staff Responsibilities—To probe into damaged areas and report extent of damage to communications facilities (ex Calgary) over land line facilities to the Lethbridge Restoration Centre.

Total Staff 1

Reporting Centres have been designated in areas outside the effective range of a nuclear device and outside the radio-active fall-out paths originating from the probable target areas of Edmonton and Calgary. Radio-active monitoring equipment will be issued to Reporting Centres for the safety of personnel engaged in this activity.

Relocation Centre (Banff)

Department Heads or their authorized representative and the General Counsel.

Responsibilities—Responsible to the General Manager for the preparation of departmental administrative policies, for the re-organization by departments during the shock phase that will provide for the operational capabilities of departments during the recovery phase in a location other than the target areas of Edmonton and Calgary.

Accounting Department Staff	6
Commercial Department Staff	9
Engineering Department Staff	5
Plant Department Staff	5
Traffic Department Staff	9
General Counsel	1
Total Staff	35
Grand Total	275

The foregoing is a breakdown, in general terms, of the staff requirements and functions in the several Alberta Government Telephones Emergency Operations locations. More detailed information on the same subject is contained in the Alberta Government Telephones Emergency Operations Manual (General Circular 211-302), which has been issued to all Emergency Operations personnel.

Alberta Government Telephones has recognized that the effectiveness of the Emergency Operations programme is contingent upon the efficiency of Emergency Operations personnel under actual emergency conditions. Perhaps the most vital factor in this consideration, is the employee's concern for the safety of his immediate dependents. Regardless of the urgency for Alberta Government Telephones to maintain continuity of vital communications, employees who are required to separate from their families during emergencies to meet their assigned functions will at their best be relatively ineffectual, if indeed they arrive at their emergency location at all.

Under these circumstances, Alberta Government Telephones is arranging for survival accommodation, food and welfare in Alberta Government Telephone buildings for all employees and their immediate dependents who are required to relocate in order to meet their assigned emergency responsibilities. These facilities will be provided until employees and their immediate dependents can be absorbed into the Emergency Welfare Services billeting programme.

Instructions are contained in the Emergency Operations Manual regarding the warnings (Canadian Government and NORAD) and the action to be taken by the employee and his immediate dependents upon receipt of a warning. Fanout directories are being prepared, in accordance with the several warning conditions. This has become necessary to meet the requirements for advance parties leaving for their Emergency Operations location as the situation warrants.

Employees required to relocate in order to meet their assigned functions will use personal transportation to convey themselves and their immediate dependents to their emergency location. Identification tags will be issued to all Emergency Operations personnel and their immediate dependents in order to facilitate their reception and registration at their designated location, and to assist in reuniting members of families who may become separated. Windshield stickers will be issued to provide for 'Safe Conduct' on the highways to Emergency Operations locations. Instructions are contained in the Emergency Operations Manual concerning preparation of personal transportation for highway travel during emergencies.

Survival accommodation is being arranged for Emergency Operations personnel and their immediate dependents in Alberta Government Telephone buildings at their designated emergency location. Emergency Operations buildings at Vegreville, Red Deer, Lethbridge, and Banff, have a basement P.F.[1] rating of 250+. Authorization has been given to increase the P.F. rating of all operational floors in buildings in the probable radio-active fallout paths from Edmonton and

[1] Protection factor.

Calgary to 100 P.F. All floors in the Vegreville building are presently being modified to 100 P.F. rating.

Alberta Government Telephones has requested Alberta Emergency Measures Organization to provide information on food preparation, equipment and menus; food supplies and food storage facilities that would meet with the standards for Government Rotation Programming with provincial institutions.

Alberta Government Telephones Emergency Operations Organization has designated Accommodations Managers and Staff who will be responsible for food supplies, food preparation, and food distribution in all Emergency Operations locations. The Alberta Civil Defence school is conducting courses during 1964 on emergency feeding, welfare centre managers, emergency lodging, and emergency personal services. Arrangements are being made for Accommodation Managers and Staffs to participate in these courses.

The health and welfare of Emergency Operations personnel and their immediate dependents, is a major consideration in Emergency Planning. Preliminary meetings have been held with Emergency Health Services Groups to discuss basic health and welfare considerations. These discussions have ranged from the registration of personnel, sanitation, first aid, communicable disease control to shelter neurosis. The Emergency Welfare Services has made their services and information available to Alberta Government Telephones Emergency Planning, and further meetings in this important field are to be held.

Arrangements are being made for the reception and accommodation for approximately 1500 persons in Alberta Government Telephones Emergency Operations buildings. Questionnaires have been forwarded to Emergency Operations personnel and, although the exact total is not yet available, preliminary planning has been done on the basis of 5 members in each family.

If the figure of 1500 is reasonably correct then the precursory examination of Emergency Operations buildings would indicate that sufficient space is available for survival accommodation.

Air conditioning equipment is being modified to include dry filtering and water filtering with the option of water recirculation or constant flow. The capacity of air conditioning equipment will meet the requirements for survival accommodation.

Personnel not immediately required for duties during the shock phase but required for duties during the recovery phase, are responsible for the survival arrangements for themselves and their immediate dependents. Information on the basics of survival have been forwarded to all employees. Dispersed personnel, who are required for duties during the recovery phase, will be mobilized as rapidly as possible by their respective departments in order to expedite normal operations.

Toll buildings in the target areas of Edmonton and Calgary have been studied to determine their survivability in the event of a nuclear attack. The resistance of these buildings to blast was not evaluated; only their operational capabilities in the event of fires in the surrounding area. Recommendations have been made to increase the power output of the auxiliary diesel alternators in Edmonton and Calgary to cover air conditioning in addition to toll equipment, in order that a safe temperature level can be maintained for equipment components which are heat sensitive and malfunction with an appreciable rise in temperature.

A study is presently under way to identify the equipment/materials required to provide alternate routing of communications from municipal 'unit' headquarters to zone headquarters over facilities which would not be affected by strikes on the two target areas. Part of this study has included the plotting of all other auxiliary communications networks in Alberta which may be required to supplement Alberta Government Telephones facilities during emergencies.

A survey of Alberta Government Telephones vehicles is being made to identify those required during the shock phase and those that will be held in reserve outside the two target areas for use during the recovery phase. Restoration Centres will be provided with mobile forces that will be fitted for extended operations and equipped with radio facilities that will provide the flexibility required for emergency operatons, and monitoring equipment that will ensure the survivability of the personnel involved.

When Alberta Government Telephones Emergency Communications Planning has been completed, the Emergency Operations Organization will be able to undertake the functions outlined in this hypothetical situation involving a nuclear strike on Edmonton.

Upon receipt of an appropriate warning, all Alberta Government Telephones Emergency Operations personnel will be alerted. Subsequent warnings will result in advance parties and main parties manning their respective Emergency Operations locations.

Upon notification that a strike has been made on Edmonton together with information regarding the direction of the radio-active fallout path, (southeast for the purpose of this evaluation) the Reporting Centres at Drayton Valley, Sangudo, and Westlock will be instructed by Restoration Centre (Vegreville) to report the damage to communications facilities located to the south, west, and north of Edmonton; Restoration Centre (Vegreville) will undertake the assessment of damage to facilities located east of Edmonton when the radio active level is sufficiently low in the easterly direction.

The various reports will be analysed in the Restoration Centre (Vegreville) and a damage assessment report forwarded to the Emergency Operations Centre (Red Deer) over radio facilities.

Restoration planning will be undertaken by the Emergency Operations Centre (Red Deer) based on

(Continued on page 10)

BRITISH COLUMBIA EMERGENCY FIRE DEFENCE PLAN, 1964—*Concluded*

By BASIL NIXON, *Fire Marshal*

Part II—Operational Instructions—All Concepts

Duties and Responsibilities

The Plan must be completed expeditiously and be readily functional in an emergency.

EMERGENCY DEFINED

An EMERGENCY means a declaration of such by either:

(A) THE NATIONAL ATTACK WARNING SYSTEM

or

(B) THE LIEUTENANT-GOVERNOR-IN-COUNCIL

Although a glossary of terms and abbreviations is contained in the Plan it might be advisable to give the reader an interpretation at this point of those abbreviations appearing in this article:

SFSOP—Senior Fire Service Officer Provincial (Fire Marshal)

SFSOZ—Senior Fire Service Officer Zone

SFSOS—Senior Fire Service Officer Sector

SFSOA—Senior Fire Service Officer Assembly

SFF—Senior Fire-fighter

FFSC—Fire-fighting Support Column

FFC—Fire-fighting Component

FAD—Fire Apparatus Dispersal.

CODE 9

The signal to indicate the plan is in effect and immediately operational will be passed to the SFSOZ by the SFSOP in the following forms:

(Current Security Prefix) CODE 9

The security prefix will be changed periodically as required and will be given to each SFSOZ by SFSOP. The SFSOZ will pass the prefix to all persons in his Zone entitled to it. The SFSOZ will decide who is entitled to it.

Although it is unlikely that REGHQ will be unable to make contact with the SFSOP such an eventuality must be recognized, therefore if this situation does arise the signal will be given directly to SFSOZ by the Canadian Army at REGHQ.

OPERATIONAL FUNCTIONS

ALERT

CONCEPT I—CODE 9—Target Area Fire-fighting Forces Activate FAD Plan.

SFSOP—To REGHQ (or if impossible operate from present position).

SFSOZ—To ZONE HQ (or if impossible operate from present position).

SFSOS—To SECTOR HQ (or if impossible operate from present position).

SFSOZ—Establish Communications—Test links between—REGHQ—SECTORS—ADJOINING ZONES.

Stands by for 'NUDET REPORT'.
Receives 'NUDET REPORT'.
CDN. Army advises MSC's re-entering.
CDN. Army advises MSC's Number,
Location,
Re-entry Route,
Destination (if possible)
ETA.

SFSOZ—Issue Joining Instructions to Units (By Number) except Sector Units (FFC).

JOINING INSTRUCTIONS:

Example: DA—69 WILL JOIN MSC 954 at CACHE CREEK UNIT NOW FFC AND UNDER CDN. ARMY DIRECTION
FFC—CONTACTS SFSOZ OR SFSOS IF IN SECTOR
SFSOZ—CONTACTS SFSOP

LINE OF COMMAND:
SFSO of FFC is the Senior Fire-Fighter present
FFC—Maintain contact with Sector or Zone if no Sector
Requests assistance from Sector or Zone if no Sector

NOTE: SECTOR—ADVISE SFSOZ constantly of each Move

NOTE: SFSOZ—ADVISE SFSOP constantly of each Move

FFC UNDER CDN. ARMY and SFSOS or SFSOZ if Outside Sector

FFSC UNDER SFSOP

SFSOS UNDER SFSOZ

SFSOZ UNDER SFSOP

CONCEPT II—CODE 9

As in CONCEPT I

Prepare to rendezvous apparatus according to FAD Plan. ANNEX 1—VANCOUVER
ANNEX 2—VICTORIA

CONCEPT III—CODE 9

As in CONCEPT I

FFSC—'STAND BY' to receive instructions from SFSOP—check logistics.

In all CONCEPTS where breakdown of chain of command occurs the Senior Fire-fighter will assume command.

SFSOP

If possible or advisable the SFSOP will proceed to REGHQ and assume command of the BCFS under the general direction of the Senior Governmental Official present.

The SFSOP will immediately establish communication contact with the SFSOZ in all Zones and proceed according to the British Columbia Fire Defence Plan.

SFSOZ

The SFSOZ shall immediately assume command of all Zone Fire Services and if possible or advisable proceed immediately to Zone Headquarters, except in VA-VI Zones where the SFSOZ will respond to TAHQ.

The SFSOZ shall establish communication contact as follows:

(1) With SFSOS

(2) With SFSOP

(3) Adjoining Zones as far as possible.

The SFSOZ will, under the general direction of the Senior Military Commander present, deploy Zone fire-fighting services where required and according to the British Columbia Fire Defence Plan.

Vancouver and Victoria SFSOZ will deploy sector fire forces through the SFSOS and/or the SFSOA and deploy directly, at his discretion, those fire-fighting units not part of the Sector establishment but within his Zone.

The SFSOZ will assume command of and deploy according to plan any FFSC which may be within his Zone and which may be without contact of SFSOP.

SFSOS

The SFSOS will proceed to Sector Headquarters and establish communication contact as follows:

(1) With SFSOZ

(2) With SFSOA

(3) With Senior Military Officer i/c at Sector HQ. With Senior Military Officer i/c at Sector Assembly Area.

The SFSOS will carry out, with the approval of the Senior Military Officer i/c, any instructions received from SFSOZ.

The SFSOS will assume command of all fire-fighting forces in the Sector and deploy according to Sector requirements.

SFSOA

The SFSOA will proceed to the Sector Assembly Area and assume command of all fire-fighting forces in the Area.

The SFSOA will immediately establish communication contact with the SFSOS and deploy area forces under the direction of SFSOS.

The SFSOA will assign FFC's to the MSC's as required.

The SFSOA will remain at the Assembly Area unless otherwise instructed by the SFSOS or SFSOZ.

Chart I—INDUSTRIAL AND INSTITUTIONAL

For the most part industrial fire services will function under the direction of the SFSOZ according to the exigencies of the moment.

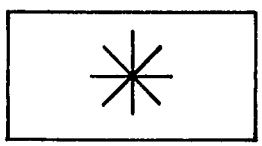
Institutional fire services will continue to provide protection for the institutions and will follow any instructions which may be received by the SFSOZ.

The Services, both industrial and institutional, will plan with a view to providing efficient fire prevention measures and evacuation procedures. It is felt that the best interests of continuance of industrial activities will be served by non-interruption of security services in this field.

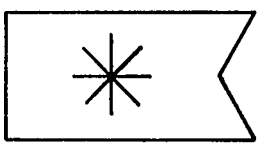
IDENTIFICATION

The following symbols indicate Fire-fighting Activities:

MILITARY



CIVILIAN



The National Survival Operating Card is folded, three leaf, and measures folded 4″ × $2\frac{3}{16}$″ and is entitled:

NATIONAL SURVIVAL OPERATIONS CARD.

SAMPLE:

Outside:

SPECIAL INSTRUCTIONS

IMPORTANT
This card must be replaced when the bearer is reassigned to a fire station, and be sure to destroy old card.

Know the Warnings . . .

THE ALERT
On sirens, horns, whistles, etc.: Steady blast for 3 minutes or more, means an attack is probable or radioactive fallout from an attack elsewhere is expected.
Listen to your radio for instructions. Do not use the telephone. Prepare to put your survival plan into operation.

TAKE COVER
A rising-falling note on sirens or short blasts on horns, whistles, etc., for 3 minutes or more means danger of immediate attack in your area.
Take the best available cover immediately wherever you happen to be.
If possible listen to your radio for instruction.

ALL CLEAR
Announced over the radio for areas expected to be free from direct attack for 1 hour or more, providing these areas are not in danger from fallout.

WHEN THE ALERT IS SOUNDED, PROCEED AS QUICKLY AS POSSIBLE TO THE NEAREST ASSEMBLY AREA.

NATIONAL SURVIVAL OPERATIONS CARD

(B.C.F.S.)

.....
(Name)

.....
(Fire Department)

Issued ....., 19.....

2M-763-9278

Inside:

TELEPHONE FAN-OUT
FAMILY DISPERSAL

.....
Will phone you.

.....
You will phone.

.....
You will phone.

.....
If NO contact, you will phone.

.....
If NO contact, you will phone.

Keep important phone numbers handy.

ASSEMBLY INSTRUCTIONS

From HOME go to:

.....

or

.....

From WORK go to:

.....

or

.....

NEXT OF KIN

Name .....

Address .....

Children: .....boys .....girls

School attending .....

I SECTOR—BROWN
Assembly area .....Britannia Beach

II SECTOR—BLUE
Assembly area.....Haney

III SECTOR—RED AND GREEN
Assembly area .....Langley

IV SECTOR—YELLOW
Assembly area .....White Rock

IMPORTANT PHONE NUMBERS

Name..... Phone.....

Name..... Phone.....

Name..... Phone.....

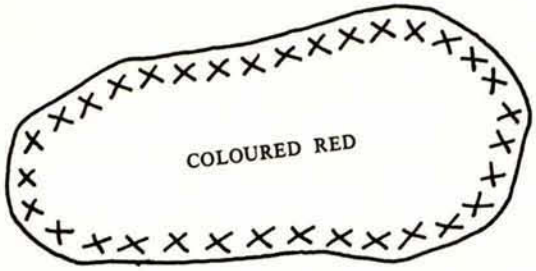
Name..... Phone.....

ZONES

Zones are identified by letter prefix as follows:

VANCOUVER	— VA	PRINCE GEORGE	— PG
VICTORIA	— VI	PRINCE RUPERT	— PR
KAMLOOPS	— KA	NELSON	— NE

AREA OF FIRE



FIRE APPARATUS

Each piece of fire apparatus is identified by number prefixed by the ZONE letters. The white letters and numbers are $1\frac{7}{8}$" high and $\frac{5}{16}$" thick placed on a decal (black) $7\frac{1}{4}$" × $2\frac{3}{8}$".

EXAMPLE:

VA 168	VI 250	KA 22
PG 68	PR 72	NE 45

These decals are placed at the front and rear of each vehicle. It is the responsibility of each Fire Chief to keep vehicle identification up-to-date.

IDENTIFICATION

FIRE-FIGHTERS

All fire-fighters carry an identification card in addition to a National Survival Operations Card.

The I. D. card is $2\frac{3}{8}$" × 4".

SAMPLE:

FIRE CHIEF'S SIGNATURE

BRITISH COLUMBIA FIRE SERVICE

This will Certify that

.....

is an Accredited Member of the

.....

Fire Department which is a component of the British Columbia Fire Service.

.....

FIRE MARSHAL

MEMBER'S SIGNATURE

THIS IDENTIFICATION CARD TO BE SURRENDERED ON TERMINATION OF SERVICE

When a fire-fighter reports to an Assembly Area or ZONE SECTOR Headquarters other than his normal station he will be required to show his identification card. It is the responsibility of the fire-fighter to keep his NATIONAL SURVIVAL OPERATIONS CARD up to date. Replacement cards can be obtained only from the SFSOZ.

In addition to the foregoing identification card Local Assistants to the Fire Marshal who are persons in authority carry identification cards measuring $2\frac{3}{8}$" × $3\frac{7}{8}$", coloured blue.

SAMPLE:

FIRE MARSHAL'S OFFICE
DEPARTMENT OF THE ATTORNEY-GENERAL
PROVINCE OF BRITISH COLUMBIA

This will identify

.....

as Local Assistant to the Fire Marshal for the District of

.....

The bearer is authorized to carry out the responsibility of a Local Assistant for the Province of British Columbia by virtue of the *Fire Marshal Act* (R.S.B.C. 1960).

Valid only as long as the bearer is Local Assistant.

(Signature.)

Badge No. .....

Fire Marshal.

Local Assistants who number approximately three hundred and twenty, of whom approximately one hundred and fifty are members of the Royal Canadian Mounted Police and certain Municipal Police Forces, also carry a metal badge.

SAMPLE:



FIRE APPARATUS DISPERSAL

A plan for the dispersal of fire apparatus in the Vancouver and Victoria Target Areas has been designed and is based on CONCEPT II of the B.C. Fire Defence Plan.

In each of the VA and VI Zones the plan calls for the dispersal on the Signal Code 9—Carry Out Concept II—of pre-designated apparatus to the extent of sixty-five per cent.

This apparatus proceeds to pre-assigned destinations which are the appropriate Canadian Army Assembly Areas. Drivers follow a colour code which indicates their

1. Colour station,
2. Colour route,
3. Colour Assembly Area.

Off-duty fire-fighters respond to the station and/or apparatus to which they are normally assigned and according to their National Survival Operations Card.

Each fire-fighter is issued a manual of instructions entitled:

FIRE APPARATUS DISPERSAL PLAN
VANCOUVER ZONE

and

FIRE APPARATUS DISPERSAL PLAN
VICTORIA ZONE

Having in mind the probability that the actions of the fire-fighter could be influenced by concern for the safety of his family in the event of an emergency it has been suggested that the fire-fighters organize a family dispersal or evaculation plan whereby off-duty men responding to assembly areas, would, as far as possible, take to the assembly areas with them their own families together with the families of those on duty. At this point architects of the Plan see no reason why this could not be done. However, this arrangement would have to be made by the fire-fighters themselves because of their intimate local knowledge.

The Canadian Army has been given the responsibility for rescue and it will be realized that fire between the forces and the rescuables must be controlled. This fire-fighting support is the responsibility of the Civilian Fire Service augmented by segments of the Military Fire Services which are part of the Fire Defence Plan.

The co-operation of each fire-fighter in the Province will be necessary, otherwise the Canadian Army may never reach those men, women and children whose immediate rescue is imperative.

Officers of the Provincial Fire Marshal Office and executive officers of the various fire departments will be pleased to make available any further information desired.

This article, describes, in condensed form, fundamentals of the British Columbia Fire Service Emergency Plan intended to give the reader an idea of activity in the field of emergency operations.

It will be appreciated that it would be impossible to describe in detail all facets of the Plan, or provide in this space the numerous maps and charts connected with the Plan. However, it is hoped that our attempt to describe in a limited number of words the British Columbia Emergency Fire Defence Plan will be of interest to those similarly committed and those with a responsibility in the field of emergency planning. ▲

Alberta Government Telephones—Concluded

priority of service and additional information supplied by the Plant, Commercial, and Traffic department groups. The completed Restoration Plans will be authorized and returned to the Restoration Centre (Vegreville) over radio facilities and the required personnel dispatched to undertake the facility restoration.

It is emphasized that the Restoration Centres have a built-in capability of operating independent of the Emergency Operations Centre if a requirement exists.

This hypothetical situation has been dealt with in a somewhat summary fashion, but if the planning has been done objectively and in depth and supported by an employee information program that has persuaded the employee that Alberta Government Telephones is meeting his survival needs at his designated location, then continuity of vital communications becomes closer to a reality.

Much valuable assistance has been given to Alberta Government Telephones Emergency Communications Planning by Mr. A. Lavoie, Co-ordinator, Alberta Emergency Measures Organization; Mr. E. Atkins, Regional Director Federal Emergency Measures Organization; Mr. R. F. Jobson, Regional Director, Emergency Supply Planning Branch; Member Companies, Trans-Canada Telephone System; and Mountain States Telephone and Telegraph Co., Montana. ▲

CIVIL DEFENCE IN SWEDEN

Introduction

1. In a pamphlet, published by the Swedish Ministry of Interior on the instruction of the King in Council distributed to every Swedish home, is the following message:

> Sweden has the *will* to defend herself,
> *can* defend herself,
> and *shall* defend herself!
> Resistance will be relentless and continue in all circumstances.
> This depends on you—your contribution, your determination, your will to survive.
> We will never give up!
> Any statement that
> resistance shall cease
> will be false.

2. The reader will find in the booklet a series of unpleasant truths: "Modern warfare is ruthless and total . . . the aggressor will seek to break down our resistance by any means . . . you must accept shortages, rationing, evacuation, direction of labour etc. . . . a people at arms cannot maintain the ways of peace".

3. All those things are more familiar to other nations than to the Swedes, as the latter have not been engaged in war since they fought against Napoleon. The Swedes have, however, been trying to learn from other nations experiences in World War II and the booklet is one attempt to translate those experiences into Swedish circumstances.

4. Many of the differences between the Swedish Civil Defence organization and the Civil Defence of other countries either have quite obvious causes or are caused by specific and, in some cases, unique administrative traditions.

5. Sweden, ranking fourth in size among the countries of Europe and almost one and a half times as large as England, has seven and a half million inhabitants, only 48 inhabitants per square mile. This is not much compared to England's 550.

6. There are 96,000 lakes in Sweden. According to the Swedes themselves the rest of the country is solid rock; perhaps not always in the shape of mountains. It is almost always there, anyhow, and the inhabitants of the country do not need to dig very deep to find it. These natural sources of rock make shelters in rock a matter of course.

7. The sharp formal division in Swedish administration between the policy-making executive departments and the purely administrative boards and agencies is unique. The eleven departments are mainly secretariats for their respective heads, the cabinet ministers. About 50 central agencies function independently under the departments to which they are subordinated in an organizational sense only. These boards, etc. are responsible directly to the Government, which appoints directors-general of each body. One of these bodies is the Civil Defence Administration.

8. Sweden is divided into 25 provinces, including Stockholm, the capital. Crown-appointed Governors head the Provincial Governments. Stockholm is a country co-operate with a Governor-General.

9. In each one of these Provincial Governments there is a Provincial Civil Defence administration under a Director and with about 15-20 officers and clerks. There is also a military Liaison Officer. The provinces are in turn divided into Civil Defence Areas, each one with a Civil Defence Controller, who is appointed in peace for service in wartime.

10. Thus there is civil defence responsibility at every administrative level: the King-in-council (that is the King and Cabinet)—the Department of Interior—the Civil Defence Administration—the Provincial Government and the local Civil Defence Areas. At each level there is also co-operation, even in peacetime, between civil defence and corresponding military authorities: the Commander-in-Chief—the military commands—the military districts and the local authorities, Home Guard, etc. As a whole, administrative details of this kind must have a certain influence upon the organization and its form.

11. There is, for instance, the fact that the Swedes have, as somebody once put it, voted themselves into Civil Defence. In 1944 a law was passed by the Riksdag —the Swedish Parliament—stipulating that every citizen, man or woman, is liable to service in civil defence —in fact a nation-wide civil defence conscript service. Exempted are men in military service and, of course, sick and infirm.

12. Generally speaking, the civil defence duties may be divided into two main groups—measures to prevent damage and relief activities. Measures to prevent damage include black-out, alarm and evacuation, the construction of shelters and, as a long-term programme, a more rational town-planning.

13. The main components in the Swedish civil defence system are evacuation, shelter constructions and the services branches for relief activities in the first place.

Evacuation

14. The most important of the three components is —in Sweden—evacuation. It is on the evacuation idea that Sweden is basing her civil defence system. In fact, the Swedes have worked out plans for moving nearly 3.5 million people, almost half the population, if needed. The Swedes have space enough. Luckily they have buildings too out in the countryside, where most of the evacuees will be billeted. Sweden's urbanisation has been a matter of a few generations only and the farm-people out in the country nowadays to a great extent

have houses built for the bigger families of 75 years ago. In many cases the evacuees just go back to the old homestead. The average Swede has at his disposal today 36 square yards of dwelling place and will in wartime be restricted to about 12 square yards. This is, of course, a situation which may have changed in the next generation, if the old houses are not properly maintained.

15. In case of war, many towns and small target areas and a few large invasion areas will be emptied into safer parts of the country. Only between 50,000 and 100,000 people out of Stockholm's 800,000 will stay behind to run essential services and to fight fires, etc. In many cases the evacuees will be billeted in the neighbourhood of the target area in question, so that people, when the war situation permits, may keep in touch with their homes and even work on the old spot. The Stockholmers, however, are for many practical reasons forced to go further away up to 250 miles from home.

16. Temporary evacuation would be hopeless, the Swedes think. The enemy need only send over a few aircraft each day to keep people scuttling madly back and forth. The Swedes are therefore preparing for a more or less permanent turning over of the whole Swedish population from peace to war.

17. It might be worth underlining that Sweden is not totally lacking experience in the evacuation field. Thousands and thousands of refugees took shelter in Sweden during the war—Norwegians and Danes, Finns, Estonians and Poles. The civil defence organization not only took care of the first-aid problems (i.e. receiving the refugees, health control, clothing and feeding, etc.), but also handled a certain number of refugee cases more permanently. Civil defence personnel, mostly specialists and people in the Evacuation and Welfare Services, thus during the years 1944-1946 took care of 120,000 refugees and convalescents in more than 800 camps. And 30,000 cattle too, which the Finnish refugees brought over the border. This was not much, compared to the problems on the continent after the war. By comparison, it would mean less than one million foreign refugees in England. Anyhow, it gave Sweden some practice.

18. The Swedes are, of course, clear that any great interference with the normal spreading of the population is accompanied by a weakening of the community's economic and social functions and consequently a diminishing of the power of resistance. They are clear that an extensive evacuation of workers will cause dislocation of the country's industrial life and reduce production of war materials.

19. It is presumed, however, that in a future war the initial battles and the blows aimed at the civil population will determine the course of war. The Swedes believe in what NATO and other civil defence authorities have said about "the survival period". And they believe that during such a period it will not be possible for certain branches of communal and industrial life to function, at least not to any great extent. Thus Sweden has made a choice between the demands of the functioning of the community and the protection of civilians. The result of this choice is the evacuation planning, involving almost half the population.

Preliminary Evacuation

20. And how do the Swedes know then, when it is critical? They do not believe in a tactical warning. They hope for a strategical warning, which would enable them to carry out the first part of their evacuation measures with sufficient time at their disposal. That would also make it easier to complete the final evacuation.

21. This preliminary evacuation is carried out gradually for the non-working population: children under the age of 16 with their mothers, relatives or other persons responsible for them, old and sick people with their nurses and other non-working persons. This evacuation is planned for centres with more than 10,000 inhabitants and for certain smaller centres and areas, which are potential targets for air raids or invasion.

Final Evacuation

22. If the danger of war grows imminent a final evacuation may be carried out. When this is completed it will have covered the majority of economically active persons. Such an evacuation is primarily planned for cities with a population of more than 30,000.

23. Remaining behind after a final evacuation will only be those, whose services are indispensable in the town in time of war—personnel in the civil defence, the war industries, the communications and so on: totally about 5-15% of the peacetime inhabitants of the town. Nearly one million people are involved in final evacuation.

Blitz Evacuation

24. Places, for which final evacuation is prepared, are also planned for a so-called blitz evacuation. It means that everybody who has not been instructed to stay—including members of the armed forces who have not been called up—are to leave as soon as possible. Those who are to stay will be notified in advance by the authorities or by their employers. A blitz evacuation can be carried out in Stockholm in about 36 hours.

Shelters

25. Solid granite and gneiss being the major ingredients in the country's geological structure, Sweden has become a pioneer in building underground. The first factory was moved into the rock more than 20 years ago, and since then numerous other plants, hangars, military and civil defence headquarters, munition and fuel dumps as well as stores of medical equipment have gone underground, so have the civil defence shelters.

Standard Shelters

26. Modern buildings in built-up areas—dwelling-houses, industrial buildings, hospitals, schools etc.—are provided with a shelter when being built. These 'standard shelters' are reinforced concrete bunker constructions in the basement of the houses. The shelter shall, according to law, be large enough to accommodate the peacetime inhabitants of the house, and strong enough to stand the pressure of the debris, if the house above should be demolished. Gas-protection doors and air-purifiers, mostly operated manually, complete the equipment. The builder himself is responsible for the shelter. Civil Defence and local authorities control him. The standard shelter gives good protection against conventional weapons, gas and fallout, and gives reasonable protection against atom bombs (not against direct hits or even hard nearby hits.) The protection afforded by the standard shelters is such that they are worth-while —at a cost amount to approximately 2% of the total cost of the house, and the cost is of course paid by the rent and thus divided among the inhabitants of the house. The total investments on the average per year are about 2.7 million pounds. For the period 1945-1962, the total investments have been about 24 million pounds.

27. Since 1945, Sweden has built about 35,000 such shelters all over the country. They can in an emergency accommodate 2.3 million people in round numbers. The number of standard shelters is increasing by more than 2,000 every year; more than 2,000 shelters every year; more than 2,000 shelters or some 200,000 shelter seats.

28. It ought to be added that the 'standard shelters' have their peacetime use as well, and that the authorities are trying as much as possible to stimulate builders and house-owners in that respect.

Rock-Firm Shelters

29. In the central parts of Sweden's biggest towns, rock shelters are being built. There are no standard shelters in these vulnerable central parts, from which people are going to be moved out as soon as the first evacuation steps are taken.

30. Rock-firm shelters are going to be used as temporary protection for people going to be evacuated but for some reason or another unable to get out of town immediately. The rock-firm shelters resist the effects of nuclear weapons except direct hits. They will be used as temporary or permanent lodging for people being left behind: war industry workers, telephone, telegraph and railway people, and service people needed by these small civilian garrisons. There are of course other uses too, according to the local planning. In some places, the country's administration will move into the rock shelter, or they may plan to use the shelter as a hospital, for store purposes etc.

31. The bill for the 14 new shelters now ready in the 9 biggest towns, including Stockholm, amounts to 7 million pounds. Of the cost, the Government roughly bears two-thirds, and the community the rest. The cost may seem high but is not, considering what the community gets for the money. The shelters are all designed to make the most of possible peacetime usefulness. In fact, some shelters in especially favourable sites will pay for themselves 100%. With most shelters, however, the authorities will be happy if 40% of the total cost is paid by peacetime use.

32. Among these shelters is Stockholm's Katarinaberget, the World's largest shelter, currently leased to an oil company and with room for a drive-in-bank, a service station and 600 parked cars, which line the 1,500 feet tunnel in three floors. And there is Mariaberget in Västeras, two hours' drive west from Stockholm. This shelter, carved out of a hill near the centre of the town, is now functioning as a complete community centre with a garage, workshops, adult education classrooms, recreation rooms, a gymnasium for the girls' school on top of the hill, a theatre studio, a cafeteria and a shooting-range.

33. Today, there are places for 33,000 persons living in rock-firm shelters or, in case of emergency, 100,000 seats. A Royal committee has proposed a programme, which implies 50,000 additional living places. The state has accepted this programme and the building has already begun.

Service Branches

34. The Service Branches are in charge of relief activities. There are six such branches in a local civil defence area.

35. The Commanding Service stands at the disposal of the Civil Defence Commander. Besides leading the activity of the local civil defence, it is also responsible for alarms, observation and reporting of damage and for manning the radio and telephone exchanges. Sweden has a country-wide alarm system of local operated sirens. The alarm service is co-ordinated with the military anti-aircraft organization and its different air-intelligence units.

36. The task of the Rescue Service is rescuing people who are shut up in shelters and broken buildings.

37. The peacetime fire brigades, financed by the local communities, form the basis of the Fire-Fighting Service and are in war reinforced by specially trained personnel exempted from active military duty and by civil defence people.

38. The Casualty and Ambulance Services with motorised transport units at their disposal, maintain first-aid mobile units.

39. There is also a special ABC-service which among other things shall report gas and radiation.

40. The Constabulary and Guard Service is entrusted with the duties of guarding and maintaining order. The guards are equipped with military weapons. This special service has for a long time been a subject

(Continued on page 16)

SEVERE TROPICAL STORMS IN ONTARIO BEFORE HURRICANE HAZEL

The following is an extract from a report titled THE OCTOBER 15-16, 1954 STORM, HURRICANE HAZEL IN ONTARIO *prepared by* A. H. MASON, *formerly of the Meteorological Division—Department of Transport, Canada.*

Introduction

The passage of *hurricane Hazel* in October 1954 was an outstanding feature of the weather history of Ontario. In view of the extensive loss of life and property, particularly in the Toronto area, several studies of the weather features associated with this storm were undertaken by various members of the Meteorological Division staff and the following paper is an extract from the resulting report.

Previous to the storm of October 15th, 1954, it was the popular belief that while southern Ontario frequently felt the effects of tropical cyclones moving up the Atlantic coast, the area was fairly secure from the direct impact of these storms. Mr. A. H. Mason of the Research and Training Section of the Meteorological Division made a careful study of tropical storms which have effected Ontario during the fifty-year period 1900-1949. It is interesting to note that during the fifty year period under study, twenty-five tropical hurricanes have passed over or close to Ontario and eight of these storms have produced weather of extraordinary severity as regards high winds and excessive precipitation.

The Dominion Public Weather Office at Malton followed the development and progress of *hurricane Hazel* from its origin in the tropics to its disappearance in the Arctic. It became apparent early on October 15th that the storm would pass over Ontario and hurricane warnings were soon issued and direct radio broadcasts from the forecast office were made in an attempt to alert the public to the impending danger. Unfortunately, the public were not fully aware of the potentialities of the storm, with the result that needless risks were run and heavy loss of life resulted. On the other hand, storm warnings issued to shipping on the Great Lakes proved so effective that no known damage resulted to lake shipping.

These results show that the public must be educated to expect the occurrence of hurricanes, however infrequently they may occur.

The more severe tropical storms of the period 1900-1949 occurred on the dates listed below:

1900, September 11
1915, August 4-5
1915, August 21-22
1915, September 5
1923, Series of tropical storms Oct. 17-20.
1923, October 24
1932, September 3
1941, September 25

The tropical storm of September 1900 developed from the *Great Galveston Storm,* so-named on account of the loss of life and great property damage which occurred in that city where more than 6,000 persons lost their lives and 3600 houses were totally destroyed by the wind and the accompanying storm wave. After crossing the coast in a west-northwesterly direction just west of Galveston the storm weakened greatly as it turned northward across Texas, Oklahoma and Kansas along the polar front. During the night of September 10-11 the storm developed into an intense frontal low over Iowa and moved rapidly across southern Michigan and southern Ontario during the night of September 11-12. The low centre moved from Muskegon, Mich. to Sydney, N.S. in 24 hours hours, an average speed of more than 50 m.p.h. Winds speeds averaged 45 m.p.h. for 1 hour (4 a.m.-5 a.m.) on September 12th at Toronto, and at Buffalo a five-minute average wind of 78 m.p.h. was reported. Records indicate that shipping losses on the Lower Great Lakes and the Atlantic Coast were greatly reduced by timely storm warnings by both the United States Weather Bureau and the Canadian Weather Service but were still substantial. In southern Ontario great damage was done to fruit crops and orchards.

During August and September of 1915, three tropical storms seriously affected Ontario. The first of these occurred during the first week of August. A small tropical storm of little intensity moved northward along the eastern coastline of Florida on August 1st and August 2nd, and by 1300 GMT., Aug. 3rd, was moving northward near Charlotte, N.C. as a very weak low. In the meantime a wave on the polar front which twenty-four hours before had been over northwestern Missouri had moved to Fort Wayne, Ind. with a cold front southward to Nashville, Tenn. and Pensacola, Fla. By 1300 G.M.T., Aug. 4th, the wave had occluded and moved to northwestern Michigan where it remained until it dissipated four days later. The tropical storm became "lost" in the circulation around the low but it is evident that the moist tropical air associated with it moved northward across the lower lakes. At Kitchener, Ontario, 7.06 inches of rain fell in the twenty-four hours ending at 5 a.m. August 4th. Elsewhere, heavy rainfalls occurred at Brantford (3.65″), Toronto (4.29″), Agincourt (4.96″) and Stoney Creek (3.25″). Across Lake Erie, at Erie, Penn., 5.57 inches of rain fell in fifteen hours. Mill Creek overflowed causing the loss of thirty lives and property damage amounting to $3,000,000.

The second tropical storm of August 1915 followed a path very similar to the Galveston storm of 1900. Damage at Galveston was minor when compared with that in the disaster of 1900, because the city was protected by a sea-wall which had been built in the interim. On passing inland the storm weakened very rapidly and became a frontal low as it recurved over Texas. The low deepened again as it moved from Texas to Missouri after which it filled slowly as it moved northeastward along the Lower Lakes and the St. Lawrence Valley. Rainfall was not excessive along this latter part of its path except along the Upper St. Lawrence where Morrisburg reported 4.50″ and Canton, N.Y. 3.29″. These figures are believed to be representative of the amount of rain which fell in that area.

The third tropical storm of 1915 (of importance to Ontario) occurred early in September when a small but vicious storm moved rapidly northward from Western Cuba and crossed the coast at Appalachicola on September 4. Although it lost intensity rapidly on moving inland, it retained its identity until it crossed Manitoulin Island on September 7th. Heavy rain fell in Michigan and western sections of southern Ontario. Largest amounts in Ontario were reported at Listowel (3.16″) and at Elora (2.81″).

In October, 1923, three tropical storms, two from the Gulf of Mexico and one from the Atlantic, combined to give rain from October 17th to October 20th during which time more than five inches of rain fell at stations in Northern Ontario and Western Michigan. The first storm was unusual in that it originated in the Pacific south of Lower Mexico and crossed into the Gulf of Mexico west of the Yucatan Peninsula. It crossed the Gulf Coast west of the Mississippi early on October 16th and dissipated over Missouri the next day. A second storm followed 36 hours later. Its origin and its path to the point where it crossed the coast into the State of Mississippi are obscure but it may also have originated in the Pacific and followed a path parallel to that of its predecessor. This latter storm moved as a frontal low to cross northern Lake Huron on October 19th. At the same time a third tropical storm moved from east of Bermuda to cross Nantucket and Boston and became absorbed into the circulation about the low over the Great Lakes. There is no doubt that this last storm contributed to the amount of rain which fell over northern Ontario. Sault Ste. Marie (4.98″), Steep Hill Falls (5.47″) and Pagwa (5.29″) reported the largest amounts of precipitation.

Following the storm which has been described in the preceding paragraph cold air spread far southward and eastward and by October 22nd the polar front was lying quasistationary in a sharp trough about 150 miles off the Atlantic coast. A tropical storm which moved northward from Cuba became an intense frontal low off the Carolinas on October 23rd. The low moved inland along Chesapeake Bay and west-northwestward to Buffalo, thence curving to Killalow, Bagotville and eastward into the Gulf of St. Lawrence. Heaviest rainfall in Ontario occurred at Brockville (3.43″), Morrisburg (2.60″), and Ottawa (2.00″). At Seven Falls, near Quebec, 5.47″ of rain fell.

The storm of September 25th, 1941, was a windstorm of unusual violence over southern sections of Ontario. At London fifty miles of wind passed the anemometer during one hour which indicates probable gusts of 80 m.p.h. The storm originated on September 18th in the Gulf of Mexico near Burrwood, Miss., and drifted slowly southward to the central Gulf where it described a "left-hand" loop and crossing its previous path headed westward toward Houston, Texas where it crossed the coast on the evening of September 23rd. From Houston it travelled rapidly northeastward to cross Lake Huron on September 25th. In contrast to most storms of its kind, little rain of consequence fell. To the southeast of its path where the winds were strongest, not more than a few one-hundredths of an inch of rain fell at any station.

Rainfall along the Storm Path

The storm of August 24th-September 4th, 1932, has been studied in some detail with regard to the precipitation pattern along its path. This storm appeared on August 24th southeast of Puerto Rico, crossed the tip of Florida on August 29th, and the Gulf Coast west of Mobile on August 31st. It recurved after crossing the coast and moved north-northeastward as a frontal low. The storm was never of great intensity and hurricane force winds were confined to a small area.

Behaviour of Tropical Storms on Passing Inland

A cursory examination of the behaviour of hurricanes indicates that:

(i) Hurricanes which move inland into a region of uniform temperature, i.e., into a homogeneous tropical air mass, do not penetrate far inland. For this reason most of those which move across the Mexican and Central American coasts dissipate rapidly.

(ii) Hurricanes which move inland into a region of substantial temperature gradient retain sufficient energy to move inland a considerable distance and in a direction approximately parallel to the isotherms with the cold air to the left of the path. If this temperature gradient is a well defined front, the storm will become an intense frontal low.

(iii) Most dangerous to inland areas is the hurricane which arrives at the coast following a path which is almost parallel to a strong cold front which arrives simultaneously. *Hurricane Hazel* fulfilled this condition.

(iv) The hurricane which arrives at the coast following a path which is nearly perpendicular to a front usually forms a frontal low which occludes rapidly and heavy rainfall is not likely to spread far inland.

The behaviour of hurricanes in relation to temperature gradients and fronts should be studied in great detail in the hope of gaining knowledge which will assist in forecasting the paths and intensities of such storms as they move inland.

Conclusions

Any tropical storm which appears in the Western Atlantic, Caribbean Sea, or Gulf of Mexico, is a threat to the province of Ontario and should be watched with interest and concern until such time as it has completely dissipated or has definitely established a path through middle latitudes eastward into the Atlantic. In the fifty years (1900-1949) about one in fourteen has crossed Ontario and about one in forty-five has been a storm of extraordinary violence.

A tropical storm may move into Ontario from either the Atlantic or from the Gulf of Mexico. The Appalachian Mountain range is not a great enough barrier to dissipate the storm.

The failure of a storm to dissipate on moving inland is due to the existence of substantial temperature gradients—usually the presence of the polar front—at or near the coast.

The excessive precipitation associated with a tropical storm on moving inland seems to occur in a relatively narrow band, not more than 100 miles in width. Excessive flooding is therefore likely to be relatively local. This adds to the difficulty of forecasting the effects of such a storm.

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Civil Defence in Sweden—Concluded

of discussion between the Civil Defence Administration and the Government. The Administration has been trying to get rid of this responsibility as they do not think fighting actually should be a civil defence duty.

Total Costs

41. The organization will cost Sweden just about 60 million pounds for the rest of the current ten-year period, which will end in 1970. The appropriations for the fiscal year 1962-1963 were 5 million pounds and for the fiscal year 1963-1964 they are 6 million pounds. Under a long-term plan, it was arranged that the civil defence appropriations for the fiscal year 1964-1965 to 1966-1967 will be between 6 and 7 million pounds per year.

42. The Swedes have, after the war, paid about 8 shillings per annum per citizen for their civil defence through state allowances—the community and private cost not included. The Swedes believe this burden to be worth-while, at the same time as they underline how their system based on the three components—evacuation, shelters, rescue—is a system entirely of their own. They are not trying to teach anybody anything in the civil defence field. They are merely trying to make the utmost of the country's possibilities—rock and space—and to make what they can of the experiences of other nations. ▲

The foregoing is reproduced from an unclassified NATO Paper.

Secretary of Defense Robert S. McNamara, today announced the transfer of the Office of Civil Defense from the Office of the Secretary of Defense to the Office of the Secretary of the Army.

Under the new arrangement William P. Durkee, now Deputy Assistant Secretary of Defense for Civil Defense, will become Director of Civil Defense. He will report directly to Secretary of the Army, Stephen Ailes.

THE HARBOUR PROJECT

SCIENTISTS REPORT ON CIVIL DEFENSE STUDY

This is the text of a summary report on civil defense in the United States. It expresses the views of a special study group of leading scientists and engineers convened by the National Academy of Sciences.

DURING a six-week period beginning August 7, 1963, the National Academy of Sciences, under contract to the Office of Civil Defense, Department of Defense, assembled a group of approximately 60 leading scientists and engineers drawn from universities, private industry, and governmental organizations at the Academy's summer study facility at Woods Hole, Massachusetts, to examine the likely effects of enemy attacks on the United States, and the problems of civil defense of the country now and in the future. The group considered the technologies of offensive and defensive weapons systems as well as those relating to passive defense. Particular attention was directed to problems of immediate survival; long-range recovery; political and psychological impact of various possible civil defense programs; and civil defense education and public acceptance.

The study session, which was known as the Harbour Project, was under the leadership of Dr. Eugene Wigner, Professor of Physics at Princeton University. Dr. Wigner had associated with him a steering committee that included Dr. Lauriston S. Taylor, Associate Director of the National Bureau of Standards and chairman of the Academy's Advisory Committee on Civil Defense; Dr. Jack Vernon, Associate Professor of Psychology at Princeton University; John S. Coleman, Executive Secretary, Division of Physical Sciences, National Academy of Sciences; Richard Park, Technical Director, Advisory Committee on Civil Defense, National Academy of Sciences; L. Joe Deal, Acting Chief, Civil Effects Branch, Atomic Energy Commission; and Jack C. Greene, Assistant Director for Post-Attack Research, Office of Civil Defense.

General Conclusions

It was generally concluded by the Harbor Study Group that any failures to assure both a higher degree of survival and a more rapid rate of recovery from attack by strategic weapons of today and of the foreseeable future is not a result of deficiencies or gaps in our technical knowledge. If the United States is to obtain a higher degree of survival and ability to recover from attack that is contemplated by current defense planning, the primary needs are more money for passive defense measures, wider application of existing technical knowledge, and more intensive research in support of planning and program design.

It was the opinion of most members of the Harbor Group that the currently proposed fall-out shelter program advanced by the Office of Civil Defense provides somewhere near the optimum protection that can be achieved under the proposed budget. This program was, however, considered to represent a minimum level of significant protection below which a national effort may not be justified at all. A more adequate program, which was generally favored by the participants in the study, would include (1) shelters in target areas that are capable of protecting against blast and fire, (2) stockpiling of necessary supplies and hardening of critical facilities, along with intensive planning to accelerate recovery, and (3) substantially greater federal involvement in the program in an effort to improve professional competence and coordination of operations.

It was concluded that, whether or not an increased level of civil defense effort is undertaken, the program now projected by the Department of Defense at relatively low cost could contribute significantly to increased survival under nuclear attack. Moreover, this program would provide a necessary base for any increased effort toward improvement of our defenses and our ability to recover from major attack. The present program was accepted as being based on sound technical considerations, and most of the attention of the study was therefore directed toward the opportunities and difficulties of providing further passive defense capability.

Weapons Effects

The study devoted particular attention to assessments of both known weapons effects and those effects which could be predicted by reasonable extrapolation. It also devoted attention to those measures which might be applied in order to reduce or prevent losses from exposure to radiation, blast, and thermal effects of nuclear weapons which have yields as great as 100 megatons. The effects of modern biological and chemical weapons were also considered, as were the effects of nuclear weapons of special types, such as the neutron bomb, bombs designed to produce the tsunami (wave) effect, very large high-altitude bursts, weapons "salted" to increase fallout-hazards, as well as other weapons. As a result of these assessments, it was concluded that nuclear weapons of the type now in the U.S. and Soviet arsenals present the major threat to passive defense. Although yields and yield-weight ratios may be expected to increase, there is no reason to expect that the nature of weapons effects will change significantly in the foreseeable future.

Considerable attention was given to the problem of fires which result from nuclear explosions. It was concluded that, while fire would undoubtedly add significant damage to that resulting from other weapons effects in a heavy nuclear attack, most fires would occur in areas where there is heavy blast damage. Shelters designed to protect against various levels of blast would also protect against corresponding levels of radiation, both nuclear and thermal, and could readily be equipped to provide protection from fires, and at the same time from biological and chemical weapons.

The use of very high-yield weapons detonated at very high altitude for incendiary purpose might cause major fire damage. The study group was inclined to believe, however, that an enemy would be most unlikely to devote his delivery capability largely to attacks intended to produce purely incendiary damage as an alternative to producing predictable blast damage on a carefully selected system of targets.

Recovery

The study group recognized that the technology involved in sheltering from the effects of nuclear weapons has advanced far beyond our understanding of the problems of recovery. As a result, considerable attention was devoted to identifying research requirements for this very complex subject, and to placing priorities on such work. It was concluded that if improved ability to recover from the attack within a reasonable period of time is to be achieved, intensive attention must be given to a number of unsolved problems related to post-attack recovery. The study group felt that it is in this sector of planning and preparation that our national program is the most deficient.

The group believed our extremely complex economy to be particularly vulnerable because of the high degree of interdependence of its different segments. At the same time, they felt that the great size and large reserve capacity of our economy provide a potential that favors recovery if ready access to utilities such as power, transportation, and communications that are vital to its operation can be maintained or quickly restored. Recovery operations, including decontamination, would, in the group's belief, demand the availability of professional leadership, as well as plans and equipment, well beyond that which could be made available by our current program of civil defense.

Public Acceptance

It was the opinion of the study group that the public will accept civil defense programs if they are accepted by the President, the National Security Council, the Joint Chiefs of Staff, and the Congress as an integral part of our over-all defense program. It was felt that the attitudes of the general public would be greatly conditioned by the demonstrated convictions of public leadership.

It was also the opinion of the study group that the features of any civil defense program most likely to receive public acceptance are the following:

1. A clear link between civil defense and the total defense of the nation.
2. Full federal responsibility for the program.
3. Civilian leadership, with the armed forces available to provide special forms of support.
4. Maximum use of existing resources and professional organizations which are capable of aiding public safety.
5. Long-term planning, as distinct from crash programs.
6. Moderate budgets that are related in a reasonable way to over-all expenditures for defense, rather than budgets which may appear to be inadequate and incomplete. Massive and hurried programs probably will not be acceptable to the public unless international relations deteriorate severely.
7. Equitable distribution of protection for all citizens.

Impact of Civil Defense Programs

The study group made a careful effort to assess the implications that an effective civil defense program might have on our own national security objectives, as well as on the strategies of other nations. It was the opinion of those members of the group who studied this problem that although a sudden, large-scale effort might well disturb our relationships with other nations, an orderly and well-designed program having the primary purpose of providing reasonable assurance that our nation is able to survive severed damage and substantial loss of lives, or is in a position to reject ultimata, would be welcomed by our allies and would be respected by those who might contemplate aggressive action. Furthermore, it was the opinion of the group that assurance that we possess reasonable protection from sudden and unprovoked attacks would provide a more favorable climate for the adoption of significant disarmament measures on an international basis.

The group also concluded that programs incorporating the characteristics described above, which they believe are acceptable to the public, would have no more than a minimum detrimental effect on domestic and international issues of a psychological, social, or economic nature. It is of course impossible to prove that no harmful effects would accrue from any program as large and penetrating as one in civil defense might become. The study group could find no evidence, however, to demonstrate that civil defense programs of the type described would change the nature of our society in a radical way. ▲

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CIVIL DEFENCE-NORWAY

Evacuation Regulations

(ESTABLISHED BY KING'S RESOLUTION JULY 5, 1963)

§ 1

EVACUATION means removal of persons from areas which are, or supposedly might be, exposed to enemy action.

§ 2

Planning and execution of evacuation is directed by the Civil Defence Directorate, which is authorized to lay down instructions concerning the execution of these regulations.

§ 3

Evacuation is to be planned for densely populated areas with more than 10,000 inhabitants.

The Department of Justice may state that evacuation shall also be planned for densely peopled areas with less than 10,000 inhabitants, if special reasons are present.



A Civil Defence Unit in Action

§ 4

In areas stated in § 3, evacuation is to be planned for:

1. Children, and young people under 18 years.
2. Disabled persons.
3. Persons above 70 years.
4. Women in care of children and young people under 18 years.
5. Women in care of disabled persons.
6. Pregnant women.
7. Teachers of children and young people under 18 years.
8. Institutions, and their staffs, housing persons named under 1-3, hospitals not included.

The Department of Justice may for places, where special circumstances are present, direct that special plans shall be prepared concerning complete evacuation of the whole population, with the exceptions named in § 5.

§ 5

Evacuation orders issued according to these regulations do not include persons, whom the proper authorities have directed to stay in the area because of important activities, or persons obliged to report to military forces or civil emergency organizations in case of war, threat of war, or similar circumstances.

Order to stay in the area may be given even if the person concerned belongs to the priority groups named in § 4, 1st section.

Persons ordered to stay behind may be directed or allowed to move to a less exposed or better protected place in the neighbourhood of their residence or working place.

§ 6

Evacuation plans shall as far as possible be based on the will and ability of evacuees to self-help.

Each family is supposed to be moved and housed jointly if possible.

Children, young people and disabled persons are also supposed to be moved out and housed together with those who are in care of them, if these are not directed to stay behind.

§ 7

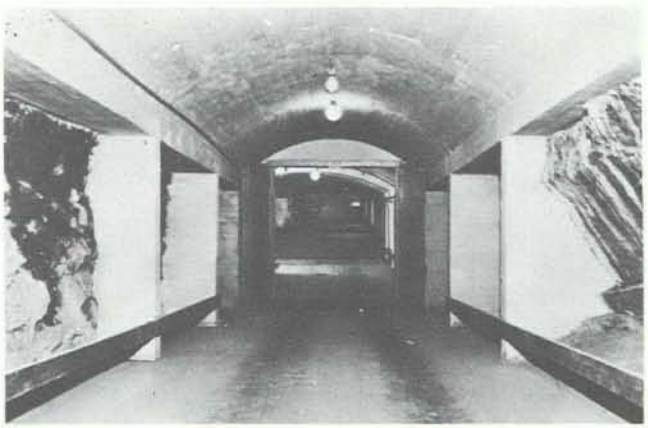
Evacuation is to be planned with the aim to be carried out without delay, and executed in course of the shortest possible time (as express evacuation) at the outbreak of war or threat of war.

Adequate protection of evacuees during evacuation is stressed.

In areas earmarked for complete evacuation (§ 4, 2nd section), complete evacuation shall be planned as main alternative, and on the assumption that limited evacuation (i.e., of prority groups, § 4, 1st section) has not been carried out beforehand.

§ 8

Necessary information on evacuation plans, including also the naming of priority groups which may be ordered to move in case of limited evacuation, is to be published in accordance with rules issued by the Department of Justice.



Entrance of a Shelter built in Solid Rock for 4000 persons.

§ 9

The Civil Defence Directorate will in deliberation with the Defence Staff state which municipalities will be earmarked as reception areas.

§ 10

Reception committees will be elected in municipalities stated by the Civil Defence Directorate. Reception committees will plan and direct the reception of evacuees according to instructions issued by Civil Defence authorities.

Quartering committees will be elected in all school districts to assist the municipal reception committee. One quartering committee may serve several school districts if the Civil Defence District Leader (i.e. the Head of Police) finds this practical.

§ 11

Reception committees will have 3 to 7 members, quartering committees 3 to 5 members.

The chairman of the municipal council and the bailiff will be members of the reception committee. Other members of reception and evacuation committees are elected by the municipal council for 4 years. Re-election is recommended at the end of the period. One of the members is chosen as chairman. A new member will be elected for the rest of the period, if a member should die, or move from the municipality. The chairman of the municipal council and the bailiff may refuse to serve as chairman or secretary to the committee.

At the election of members of reception and quartering committees, due regard should be paid to compose the committee of persons with knowledge of the supply and employment situation, health administration, social care and school system of the municipality. Persons obliged to serve in the Armed Forces may not be elected. At least one of the members should be a woman. One of the members of reception committee should represent houseowners, or users of premises obliged to receive evacuees. One of the members of quartering committees should be a local teacher.



The Evacuees are registered by the Rural Billeting Committee



Women too, are conscripted in the Norwegian Civil Defence Organization

§ 12

Orders to houseowners, or users of premises, to receive evacuees and give them accommodation including beds and other equipment, electric lighting and fuel, are given by the reception committee and will be in writing.

§ 13

Regulations stated §§ 10-12 also apply to transit areas (areas used for temporary billeting during successive evacuation).

§ 14

Civil Defence Regional Directors and District Leaders are in accordance with § 52, 1st section of the Civil Defence Act of July 17, 1953 authorized to order owners and users of railways, ships, motor vehicles and other means of transport to transport persons obliged to evacuate.

Cars, delivery vans, and trucks, not ordered to carry out transport according to 1st section, or requisitioned, or in other ways employed by the Armed Forces or Civil Emergency organizations, are supposed to be employed by owners and users to move their families out. Owners and users of the vehicles are obliged to carry other evacuees in addition if there is spare room in the vehicle. The same applies to motor-boats, where sea transport is possible.

§ 15

The Evacuation Regulations established by King's Resolution September 21, 1951 with amendments by King's Resolutions March 19, 1954 and June 21, 1956 are herewith repealed. ▲

The Nanton News

9 APRIL 1964

Storm-stayed Travellers Catered For Wholeheartedly by People of Nanton, Alta.

Efficient Work of CD Organization—Telephone Operators and Police

Nanton community did a tremendous job of aiding travellers who were stranded in the blizzard which raged all Sunday. The benefit of having well-trained Civil Defence personnel was amply demonstrated when the various departments of that organization co-ordinated efficiently and cared for and housed over 300 adults and children in the town. That number was over and above those accommodated in the Midway Motel and Nanton Hotel. The latter was packed. The Midway was almost full by noon and even the porch was filled by night-time.

CD members assisted the police in directing vehicles to the community centre where the occupants were registered, fed if necessary and billets arranged for them in churches or private homes. The travellers came from as far as Medford, Wisconsin, Halifax, N.S., Winnipeg, Creston and Michel, B.C., Edmonton, Calgary and points south as far as Coleman.

These arrangements necessitated constant telephoning to ensure that the accommodation on the CD list was actually available and later, the stranded people made calls to their destination to relieve anxious relatives.

From 4 o'clock in the afternoon until midnight four operators were on duty —two more than is usual and thereafter there were two instead of one on duty. They handled approximately 500 long-distance calls between 3 p.m. and midnight. They took messages and calls for the RCMP and took messages which were passed on the radio mobile for the RCMP and CD located at Stavely. Over and above this work, they had to generate their own power as the electric power lines were out of commission from about 10 a.m. until 4 p.m.

What price the automatic dial system under Sunday's conditions?

Tributes

Dr. Lorne Mitchell of Calgary, travelling from Pincher Creek with his wife and six of their family paid high tribute to the wonderful way they had been taken care of in Nanton and the work of the RCMP and CD officials. They spent the night in a local home and like everyone else, were extremely appreciative of the hospitality shown to them. One man who had been all across Canada said he'd never seen anything like it.

The philosophical attitude of children—or is it their trust in the power of their parents?—was a feature of the misfortune. Dr. Mitchell's small son, aged four, said if they all got killed in the ditch, his Daddy would fix them up! Another little boy said, "I just knew we were going into the ditch." In the community centre the attitude of the elder teenage sister was evident when the state of her hair-do was her main concern. Little brother let the cat out of the bag by piping up, "She dyed it!"

Besides the food which was obtained from a local store by the Civil Defence authorities, a man employed at a logging camp west of Nanton donated a large package of foodstuff, being unable to return to the camp with it and many offers of supplies were received from local people. Some of the transients offered food from their cars.

A supper of soup, sandwiches, coffee or tea was provided by CD personnel in the community centre and there was plenty of milk for children. On Monday morning they supplied breakfast on the premises.

The local police first heard of the pile-up of about 100 vehicles between Parkland and Stavely at 5 p.m. when two men entered the headquarters to report two minor accidents. The police cars couldn't make it on the highway so three local firms, Magwood Motors, Sandbeck Construction and Smith Construction, took their trucks to the scene and worked until 1 a.m. moving vehicles. This service was given free of charge. Three school buses were commandeered by the CD organization to convey the passengers to Nanton. The operation took about three hours as many vehicles had to be moved before the people could be rescued. They had frozen gas lines, shorted ignition and some of them were in the ditch. Police closed the highway at Nanton to all other traffic at 9 p.m.

The Travellers

There were couples with new babies just out of the hospital in the stranded cars and even diapers were supplied to them by local people. A honeymoon couple from Lethbridge en route to Banff spent from 12 noon until 9 p.m. in their car. But they were better supplied with clothing and rugs than some others. At least one man was travelling in a short-sleeved shirt and with no coat he felt the cold. A couple with five children, none with rubbers, commented on their being transported by the CD officials to a bus without getting any wet feet. A car from Edmonton contained people who had been on the road since 6:30 a.m. to 10 p.m. on the way to Texas.

E. D. Conville of radio station CKXL was among the travellers and he contacted the station which sent out news flashes about the shelter available in Nanton and road conditions.

The CD organization was appreciative of the co-operation of churches and householders who not only supplied accommodation but blankets and sleeping bags. They also paid high tribute to the work of the telephone operators.

Clark's Trucking sent out a tow truck at 1:30 a.m. to move a truck off No. 2A highway and returned Monday morning to bring it into Nanton. Other local firms with tow trucks were kept busy on the road too.

If undelivered return to:
EMERGENCY MEASURES ORGANIZATION
Office 420, Daly Building,
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