

DISPERSAL



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IMPLICATIONS OF NEWER WEAPONS

This is an attempt to simplify a paper written by Dr. E. E. Massey on the "Implications of the Newer Weapons".

Dr. Massey's titles have been used for the purpose of continuity and possible back reference for those who require more exact or definite information.

Scaling the Blast Effects

We have in the past made charts of the effects of the Nominal A Bomb which was considered to be equal to 20,000 tons of T.N.T. During the last war a 2,000 lb. bomb was considered a large bomb.

Fortunately, the radius of destruction of a bomb is proportional not to the power of the bomb but to the cube root of its power. Thus, an H Bomb of 5 megatons (a megaton is 1,000 kilotons, a kiloton is 1,000 tons) will give a blast effect in proportion to a nominal atomic bomb in the following order - D damage if exploded at 12,000 ft. - 12.6 miles radius.

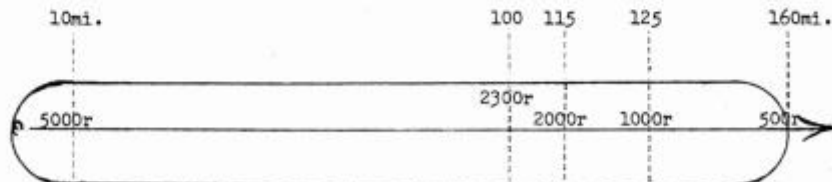
Scaling Thermal and Nuclear Radiation

The radiation effects are proportional to the power of the weapon, so that at 16.2 miles on a clear day, a moderate skin burn would be received by a person completely exposed to the heat flash of an H bomb. A sheet of white paper, of course, would be ample protection from the heat flash.

At 2 miles the immediate gamma radiation would be 250r, a dose which is rarely fatal. Note 50r is an acceptable risk. If a person threw themselves on the ground when the flash was seen, in a slight depression he might avoid receiving more than half 250r.

Contaminating Bursts

The fire ball formed by a 5 megaton H Bomb exploded at 12,500 feet will be 8,500 feet or 1.62 miles in diameter. This rising fireball draws up great amounts of earth causing coarse highly radioactive particles which tend to fall rapidly while being carried by the wind.

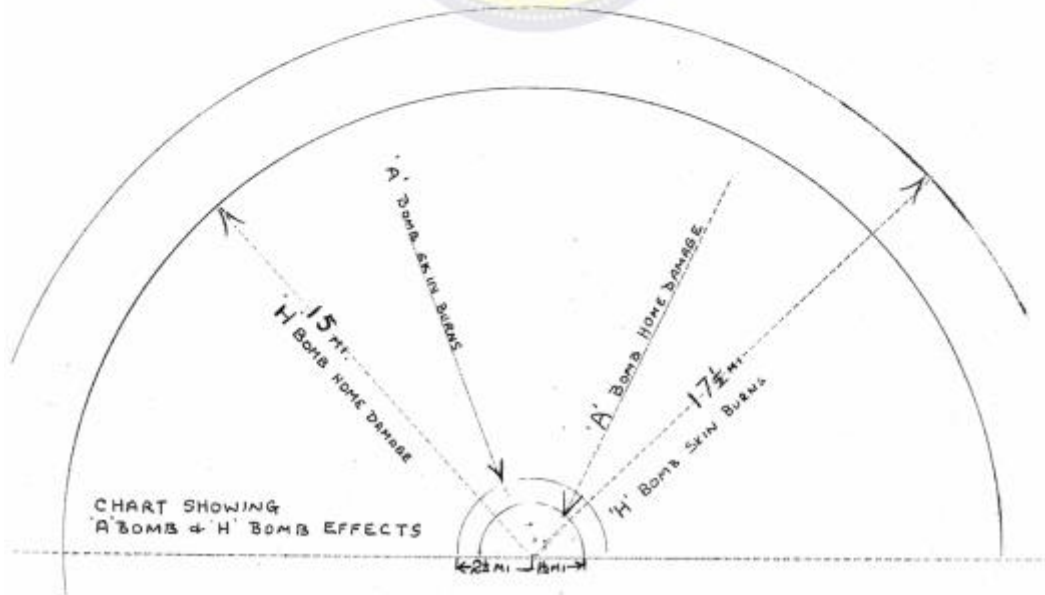
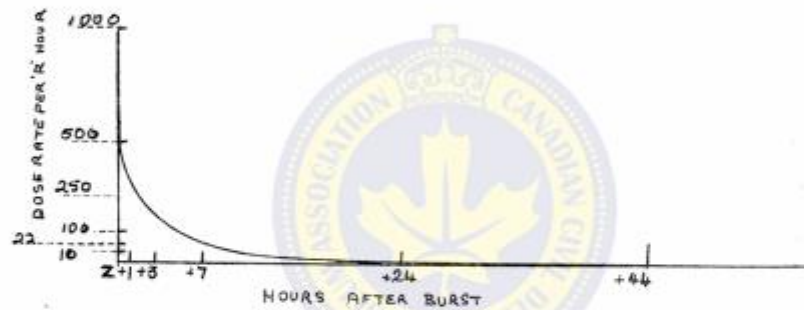


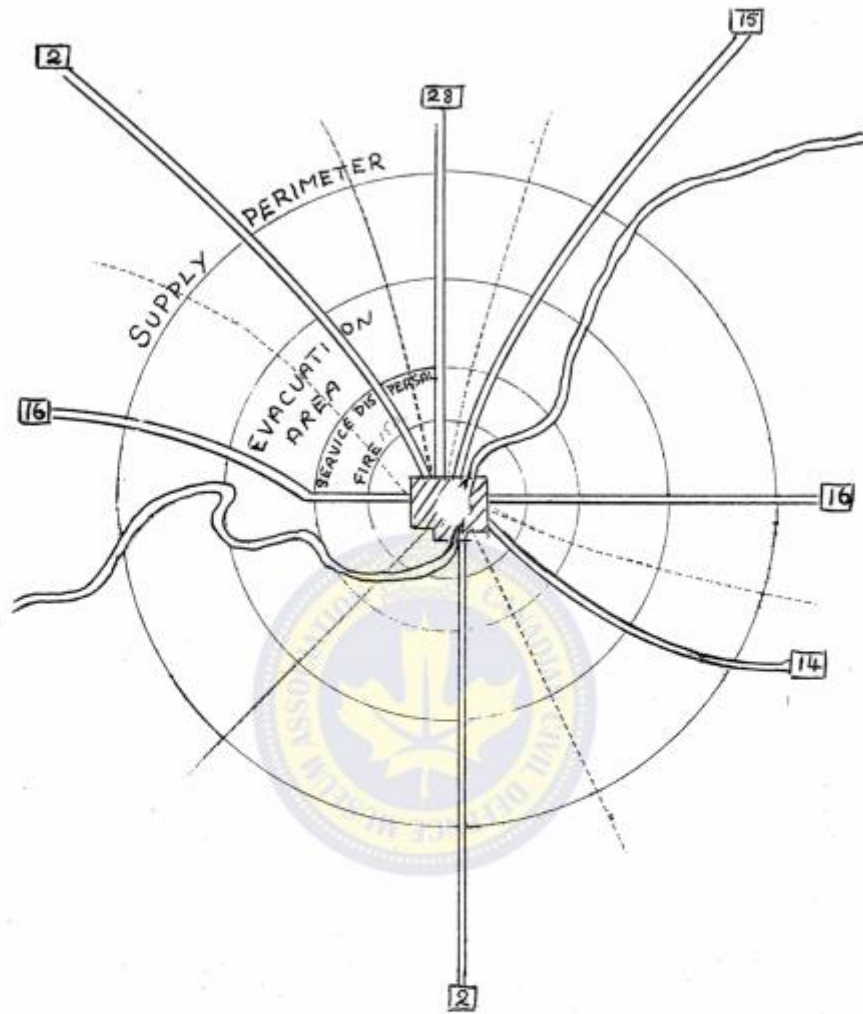
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The amount of radiation activity to which an unprotected person would be exposed is shown on the preceding pattern. A person could protect themselves from such a fall out by going under cover until the decay rate made it safe. A frame-house would afford 50% protection and a cement basement would afford 90%. Three feet of earth cover would cut the hazard to 1/5000. The fall out can be dangerous in three ways: (1) proximity (2) ingestion of radioactive particles (3) innalation. These may be avoided by keeping the overhead covering clear of such particles; taking care to see that food and water is uncontaminated; wearing a service respirator or wrapping the face in a clean cloth before going outdoors. Washing hair and body and replacing contaminated clothing.

The general wind direction and velocity in the vicinity of the City of Edmonton is being studied by the Department of Transport, meteorological section and information with regard to this will be passed to you later.

The radioactive properties of these particles tend to decay rapidly approximately in proportion to the elapsed time. This graph shows the decay rate:





DIAGRAMATIC DISPERSAL

SUB DIVISION OF DISPERSAL AREA DEPENDS UPON POPULATION DENSITY
AND NUMBER OF EVACUEES

CIVIL DEFENCE OF EDMONTON

DISPERSAL

Several schemes for evacuation of an area have been studied. These schemes seem to be based upon a partial evacuation of part of a city and little thought has been given to them except from a transport point of view.

In planning a strategic withdrawal from a city there would seem to be three primary problems.

1. Collection of evacuees within the City.
2. Transportation of evacuees from the City.
3. Location of evacuees in the Dispersal Area.

It is with this idea in mind that the following plan is put forward.

There will undoubtedly be two main phases to the evacuation:

- a. A voluntary evacuation on the breakdown of the International Situation.
- b. A controlled evacuation using all seven highways simultaneously for the evacuation of the remaining inhabitants.
 - a. The volunteer evacuation will be controlled with certain limits. The maintenance of law and order and the orderly movement of cars along the routes must be the aim of all citizens. The volunteer evacuees will be advised to settle with friends outside of that area required for the second phase of the evacuation (approx. 100 miles).
 - b. The tactical evacuation will be initiated by instructions from the Federal Government, the Provincial Government or the Edmonton Director of Civil Defence.
 1. The public will be instructed to gather at the school grounds and will be loaded into vehicles.
 2. Each vehicle having the prescribed number of passengers will be marked with the number of the "Home" school.
 3. This home school will have the same number as its counterpart in the Reception Area.
 4. Schools on the left side of the road will have odd numbers and schools on the right side even numbers.
 5. Vehicles will travel in two lanes on the highway and will remain on the same side as their "Home" and "Reception" school.
 6. Vehicles will travel at a given speed and density.
 7. On reaching the vehicle dispersal point the "Reception" area Traffic Control Police will divert the traffic toward their "Reception" school.

8. On reaching the "Reception" school the passengers will debus and register.
9. The "Reception" school staff having registered the evacuees will direct them to their destination.
10. This Reception Staff will consist of the reception area's Civil Defence and/or Welfare staff.
11. Arrangements can then be made in the reception area for a.)Feeding; b.)Clothing; c.)Shelter; d.)Categorization of Auxiliary Service personnel; e.)Collecting of information; f.)Dissemination of pertinent information.
12. Return to the city will be performed simply by putting the system in reverse.

PSYCHOLOGICAL FACTORS

- a. The plan must be simple.
- b. The plan must be decisive and direct.
- c. The plan must be readily understood by evacuees and reception personnel alike.
- d. The plan must be practical.
- e. The plan must be acceptable to the greatest number.

a. Simplicity

Under stress people tend to forget detailed or voluminous instructions. A plan has therefore been evolved whereby people mustered in their neighbourhood (home) schools will be taken to a predetermined school in the reception area. From this school the evacuees will be distributed among the surrounding homes.

A slogan type of instruction "REPORT TO THE NEAREST SCHOOL" can scarcely be forgotten. Nearly everyone knows the location of his "Home" school whether they have children or not and those who do not will only need to follow the crowds who are converging on the schools to arrive eventually. People and cars will all be travelling in the same direction - toward the home school.

b. Decisive and Direct

There can be no equivocation with regard to such instructions and no misinterpretation.

c. Readily Understood

By predetermining the "Home" school's destination people will know where they are going. They will know there is a predetermined plan.

d. Practical

An assessment of the two areas will readily determine whether the plan is practical or not. To this end a survey of the reception area for one segment of the city is being made by the Department of Education.

e. Appeal

A vague plan such as that of reporting to the nearest highway is too indefinite and since no specific destination can be known for each highway such a plan lacks decision.

The linking of "Home" schools with "Reception" schools and advising of the public as to the destination makes the plan definite and direct.

The public will realize that with varying conditions that such a plan fits most eventualities and that any imbalance due to the shifting of population by normal moves or by business and industrial employment can be taken care of by selecting larger areas for the downtown counterpart in the reception area. These areas will be known to the workers as will the destination of the home area.

This foreknowledge will do much to minimize the desire to "go to look after the family". It must be explained to the public that the imposition of their personal solution upon the plan for the many will interrupt or destroy the calculations made for evacuation.

OPERATIONAL

1. Dispersal of Services

Immediately following or during the period of voluntary evacuation, sites selected by the services for action area depots, about 20 miles out from the city, should be occupied by:

- a. Local headquarters vehicles (with radio transmitter). This vehicle to be located in Service depot on each side of the seven highways leading out of the city. Arrangement can be made for all services to be represented by one transmitter. (Communications Chief).
- b. Any vulnerable stores or equipment that may be considered necessary.
- c. The Main Control should remain in situation until Alternate Headquarters has been established.

2. Local Headquarters

These Local Headquarters will form rallying points for the services generally, and report posts should be set up to check in service personnel and volunteers.

3. Service Report Centres and Depots

These rallying points should be astride the highways preferably in a hollow (to reduce immediate radiation and heat flash hazards). They should have good access roads and vehicle parks. They must have some form of water supply, shelter and feeding facilities.

4. Organization

As rapidly as possible each Service Depot should be placed under the control of a Depot Chief who will contact Alternate Headquarters and give an assessment of the personnel and equipment on hand. The state of readiness should be indicated, gasoline supplies, etc. Under the Depot Chief the services will stand by for instructions and action.

5. Re-allocation

If the period of evacuation becomes protracted, a re-allocation of services may be made but not until a complete assessment of the situation has been.

ADMINISTRATION & OPERATIONAL SEQUENCE

Personnel

There must be a period of Public Education during which the principles of evacuation must be taught. The public must be impressed with the following points:

1. That the plan is practical.
2. That individual problems although important to themselves must be set aside for the common good.
3. That breaking the pattern of the plan may endanger the lives of many.
4. That the only reason for strict regimentation is to gain time and to make the plan work as smoothly as possible.

Preparation

The preparation of 24 hours' food supply in a small box readily packed and available at a moment's notice should be advised. A small bundle of clothing suitable to the weather should be carried with the lunch on the knees of the evacuees. What to do about electric, gas, and water services should be carefully considered and instructions broadcast. This should be recorded and records played from all radio stations.

The public should be advised of the reasons for mustering in the school grounds and of the debussing point for each embussing point.

A day-time plan for the evacuation of the downtown area should be explained.

Sanitation and chlorination of water should be explained.

Warning

Instructions to cities re evacuation will be given by the Federal Authorities or by the Provincial Government.

A controlled volunteer evacuation of priority personnel will be encouraged with restrictions as to who shall go and a minimum distance from the city set.

Time and Space

The time and space factors will be important in defining the evacuation plan. The volunteer evacuation will lessen the problem if properly controlled.

Weather will legislate the advisability of certain phases of the move and must be taken into consideration.

A move at night will be more difficult and traffic control problems will be increased.

Evacuation Signal

There must be a pre-arranged audible and/or visual signal for evacuation. Maroons could be used in addition to siren and radio warnings.

Use of the "All Clear" as an "attention" signal should be decided upon and explained.

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Assembly

On the signal all personnel and vehicles will move to the assembly points. Drivers should pick up passengers en route but must report to assembly area for instructions re route and debussing points. (Route cards could be prepared, ready for distribution ahead of time).

Vehicle Dispersal from Main Route

Dispersal points should be selected and marked to indicate routes to debussing points. The location and identification of these should be on the route card.

The number of the school should be written on the windshield with lipstick.

Debussing Point

The Reception school serves as a Registration point. All evacuees will be registered at this point and allocations of shelter given by the Reception Area Welfare Personnel, of the homes in the district to the evacuees. Route cards and allocations of shelter could be prepared and handed to drivers on arrival.

Re-fueling

Re-fueling arrangements should be made at this point if necessary.

Registration and Categorization

These Reception Schools may be used as distributing points for food and clothing and as information centres and enlistment depots for volunteers.

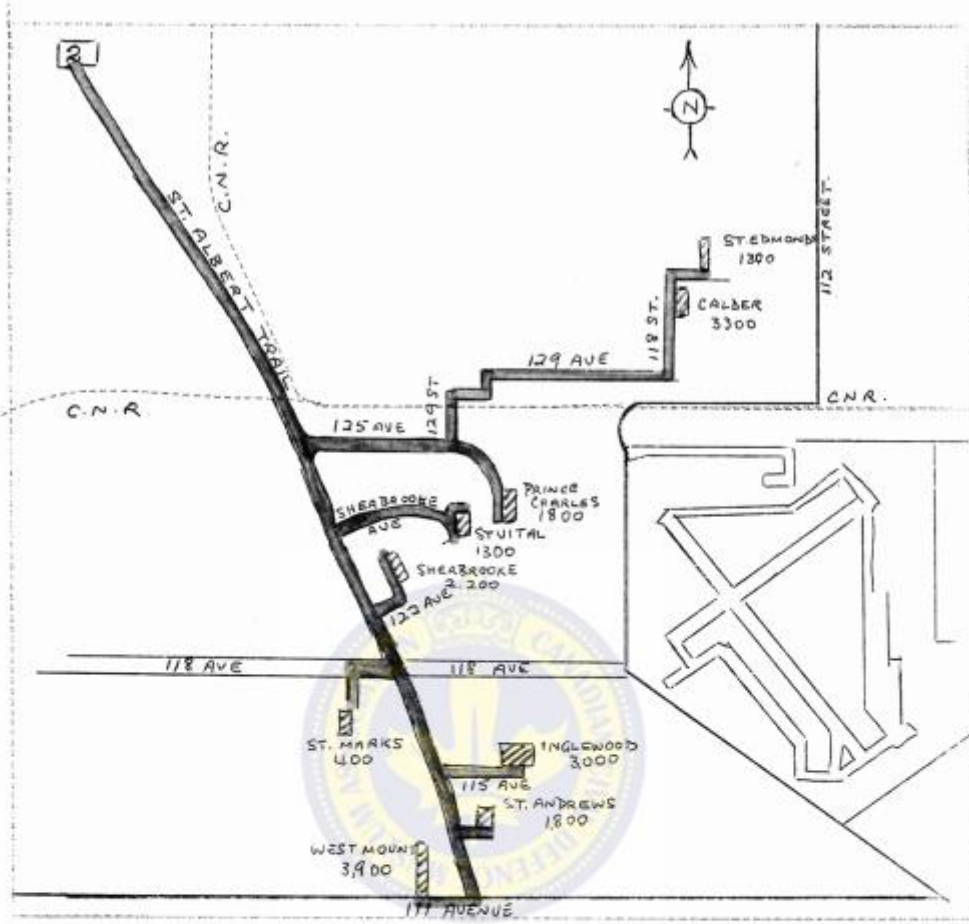
Volunteer registrants should be categorized for assistance in the existing services if required. Services could estimate the numbers of allied tradesmen required in the event that restoration be necessary. These volunteers could be deployed to Service Report Centres as required.

Housing

The Reception Welfare service would be required to make an assessment of housing in the area and all information held in the Reception School.

Feeding

Food could be distributed from these Reception Schools on a per capita basis to the evacuees in the area.



The above map of the northeast portion of the City is taken from Mr. D.L. MacDonald's evacuation map. The numbers located at each school are based upon the ratio of school population to the total population. Only the routes by which evacuation traffic would join the highway are shown. All schools on the west side of the "Trail" would have odd numbers and those on the right side even numbers.

The total population of this area is 19,000.

It is appreciated that the column on the east lane of the highway would be longer than that on the west lane. In this case, of course, balancing of the two columns would help to relieve traffic congestion on the Jasper highway.