

CAMPAIGN FOR NUCLEAR DISARMAMENT

11 GOODWIN STREET LONDON N4 • TELEPHONE 01 263 4954

INFORMATION: The Effects of Nuclear Weapons

THE FIRST part of this fact sheet is based on an official government document, published by the HOME DEFENCE COLLEGE (Easingwold, Nr York) and is also to be found (with much more detail) in the HMSO publication NUCLEAR WEAPONS.

JARGON: The discussion of the effects of nuclear bombs takes place hidden from most ordinary people by the excessive use of jargon. It is necessary to be familiar with the following terms:

GROUND BURST (GB) A nuclear explosion at street level. GB's are 'dirty' explosions pulverising and making radioactive the soil and rock at the point of impact and releasing the newly radioactive material in the characteristic mushroom cloud.

AIRBURST (AB) A nuclear explosion high above the ground. Causes less radioactive fall-out but the heat and blast effects cover a wider area (the higher the explosion the larger the area effectively destroyed).

GROUND ZERO (GZ) point of impact of a GB or point directly beneath the fireball of an AB,

Destructive Power of Explosions is measured in multiples of 1000 tons of TNT equivalent power. 1 MEGATON (MT) = 1,000,000 tons of TNT. 1 KILOTON (KT) = 1000 tons of TNT. 1 MT = 1000 KT.

EXPOSURE TO RADIATION is measured in Roentgens (r). The rate at which radioactive fallout emits radiation is measured in Roentgens per hour (rph).

THE HOME OFFICE DOCUMENT CALLED RJ-JT/MJW 741126 gives the following list of likely effects for explosions of varying size. The tables overleaf give details of the best and worst possibilities envisaged in the document. They can usefully be traced as a series of concentric circles on any Ordnance Survey maps (given an assumed target as GZ) to illustrate the likely effects on your town.

NOTES: (*)DAMAGE: 'BLAST damage to average British Houses and blockage to streets.' (**)BURNS 'People exposed in the open'. Figures refer to 'survivors'. Figures in brackets refer to expected fatalities (based on NUCLEAR WEAPONS, HMSO 1956) caused by immediate radiation released by the EXPLOSION (more fatalities occur in the outlying areas as a result of fallout in the following days, weeks, years). Burns figures DO NOT include those burned by the fire-storm (building on fire etc) — only the heat wave of the explosion.

Burns

Third degree: charring of exposed skin.

Second degree: blistering of the skin.

Third degree: reddening of the skin.

Damage Categories

- A Houses totally destroyed, streets impassable.
- B Houses irreparably damaged, streets blocked.
- C Houses severely damaged, streets difficult to move along.
- D Houses lightly damaged. Some streets open, flying glass and roof tiles.

10MT

Air Burst

DISTANCE

FROM GZ

FROM GZ	DAMAGE*	BURNS**	FIRE ZONE
0-0.25 miles	Category A	Third Degree 100%	Fire Ball
0.5-1	Category A	Third Degree 100%	Fire Ball
1-2	Category A	Third Degree 80%	Fire ball
2-3	Category A-B	Third Degree 50%	Fire Ball
3-4	Category B-A	Third Degree 50%	Fire Storm
4-5	Category B	Third Degree 25%	Fire Storm
5-6	Category C	Third Degree less than 10%	Fire Storm
6-7	Category C	Third Degree	Main fire area
7-8	Category C	Third Degree	Main fire area
9-10	Category C	Third Degree	Main fire area
10-12	Category C	Third Degree	Main fire area
12-15	Category C-D	Third Degree	Many fires
15-20	Category D	Second Degree	Isolated fires
20-25	Slight	Second Degree	Some fires
25 and over	Slight	First Degree	Slight

20KT

Ground Burst

DISTANCE

FROM GZ

FROM GZ	DAMAGE	BURNS	FIRE ZONE
0-0.25	Category A	Third Degree	Main fire zone
0.25-0.5	Category A	Third Degree	Main fire zone
0.5-1	Category B	Second Degree	Main fire zone
1-2	Category C	First Degree	Isolated fires
2-3	Category D	Slight	Some fires
3-4	Slight	None	Slight
4-5	Slight	None	None
6-7	Slight	None	None

Fallout

The level of fallout produced by a nuclear explosion depends on the size of the bomb and the type of ground which it falls on. Hard rock produces a different kind of fallout to soft clay and sand. The area covered depends on the wind direction and weather conditions.

In typical British weather, the fallout plume from a 10 MT bomb would cover an area of about 1000 square miles stretched up to 70 miles from GZ. Heavier fallout (lumps of rock and clay lifted by the heat of the firestorm) would come down within a matter of hours, nearest GZ. Finely pulverised radioactive dust would come down more slowly and evenly — all of it highly

radioactive, covering the largest area.

Dose in rads(cf):

Up to 150 No acute effects, but increasingly dangerous over time.

150 to 250 Serious illness, incapacity after two days.

250 to 350 Serious illness after four hours. Many will die after two weeks.

350 to 600 Serious illness after two hours. Most will die after 2 weeks. Survivors will not fully recover.

Over 600 Serious illness after one hour. Certain death after one week.

Some doctors say these HOME OFFICE estimates understate the dangers of exposure to radiation.

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The following table gives a rough idea of the *areas in square miles* over which three particular effects of *air-burst* weapons occur (the figures are based on S. Glasstone (ed.), *The Effects of Nuclear Weapons*):

Size of weapon	Initial radiation greater than 50% chance of death of initial radiation	Heat second-degree burns or worse to people in open	Blast destruction of or severe to houses
10 kilotons	2	6	6
100 kilotons	4	20	25
1 megaton	7	314	129
10 megatons	16	1660	590

ELECTRICITY SUPPLIES are vulnerable. Nuclear power stations are likely targets; there will be difficulties in supplying all power stations with fuel; the electromagnetic pulse will damage switchgear and other control mechanisms.

GAS PRODUCTION is also vulnerable, for similar reasons. Even where storage facilities for gas remain intact, it will not be possible to restore supplies until broken gas mains have been sealed off or repaired. Broken gas mains and furnaces will add to the 'fire-storm' caused by the heat of a nuclear bomb in a built-up area.

'For planning purposes it may be assumed that, after a nuclear attack, all energy production and supply would soon cease . . .' (Annexe to Home Office Circular ES 5/1976).

WATER SUPPLY AND PURIFICATION depends in most parts of Britain on electricity. Except for those who have access to wells, there will be little in the way of clean and uncontaminated water beyond what they have been able to store in their homes. Water mains are also likely to be broken in areas of blast, and will need to be sealed off from the system before supplies can be got

going again.

SEWAGE DISPOSAL AND TREATMENT also depend on the supply of electricity:

'the breakdown of these services, on which most of the public unquestionably rely, would be inevitable over much of the country. Water would not flow from the tap or into the sewage system. Electricity would be cut off, refuse collection would cease. Large numbers of casualties would lie where they died.' (Annexe to Home Office Circular ES 8/1976).

ROAD TRANSPORT will be very restricted if not non-existent: vehicles are vulnerable to heat (petrol tanks), as are fuel supplies. Farm animals and birds will be killed in thousands, but insects and other pests are much more resistant to radiation, and will survive and subsequently increase.

FOOD SUPPLIES will be very restricted. Existing stocks held in warehouses will be available for use, *provided that they can be decontaminated and transported*. But much of the food we eat is imported, and much of it is also processed in factories which require supplies of electricity and water — supplies that are likely to have broken down (see above).

'After nuclear attack food would be scarce . . . for planning purposes it should be assumed that no significant food imports would be received for some time . . . peace time systems of food processing and distribution would cease to function . . . no arrangements could ensure that every surviving household would have, say, 14 days supply of food after attack.' (Annexe to Home Office Circular ES 1/1979).

ALL FORMS OF COMMUNICATION USING ELECTRICITY — telephones, radio and television — will be damaged by the electromagnetic pulse, unless precautions are taken to shield them.

This fact sheet gives an idea of what the effects of nuclear war would be. For further information about what civil defence measure attacks, and what civil defence is actually being planned.