ROC/151/3/AIR
1st September 1981

NUCLEAR REPORTING CELLS - OPERATING PROCEDURE GUIDELINES

1. The current Standard Operating Procedure No 3 for Nuclear Reporting Cells was issued in November 1976 and was based on the NATO Standardisation Agreement (STANAG 2103 (NBC)).

2. These procedures require an NRC to plot on Display 'A'.

   a. all United Kingdom and certain continental nuclear bursts;

   b. the initial predicted path of fallout within Zones I and II (calculated from effective downwind messages and powers of bursts);

   c. the actual path of fallout (from threat messages);

   d. the subsequent predicted path of fallout.

3. In addition to the Display 'A' plot the NRC is required to maintain a nuclear burst tote and a plot on Display 'E' of all continental nuclear bursts received.

4. When the current procedures were introduced there was limited UKWMO/customer involvement during exercises and consequently little opportunity for customers to assess the quality and quantity of the information available to them. In recent times however there has been a marked increase in customer participation in UKWMO exercises and this has had the effect of highlighting the differing service customer requirements and confirming that plotting zones for all ground burst weapons produced complicated displays and on occasions confusing pictures for the customer; the new Zone I downwind distances have further added to these complications.

5. To establish more precisely the details of the individual customer requirements HQ UKWMO has during recent months been engaged in discussions with representatives of the various service commands. Experiments have also been going on at certain NRCs to evolve a more satisfactory and flexible method of displaying information whilst at the same time conforming to STANAG 2103 (NBC) and other steps have been taken to improve the quality of the service for customers among these the installation of Sector to Sector private wires with telegraph.

6. It is now possible to issue positive guidelines to NRC officers which supplement SOP 3 and should provide a firmer base from which they can operate. These guidelines, shown at Annex A, will be used only on an experimental basis initially before consideration is given to incorporating them into SOP 3.

7. It will be seen from these guidelines that it is still the intention to produce a library of prediction templates but before arranging for the production of 'master' copies we await the outcome of discussions being conducted within NATO on proposed changes to be incorporated in STANAG 2103 (NBC) (Edition No 5).

8. The policy of limiting the selective transmission of data within the UKWMO will continue (eg FF, PP, QQ, LL, CC etc which will always be sent to customers as routine); this additional information should provide NRCs with a store of data which can be tapped according to the requirements of the service customer.

NUCLEAR REPORTING CELLS

OPERATING PROCEDURES

BASIC REQUIREMENT

1. All NRCs are required to plot the following basic information as routine:-

   a. All United Kingdom, Continental and Republic of Ireland Nuclear Bursts received (BB, BBXX).

   b. The actual path of fallout (TT, TTXX).

   c. F/O information for area of interest (serving group and its adjacents).

   d. Details of all bursts received (Nuclear Burst Tote).

   e. RR (DR7).

ADDITIONAL REQUIREMENT

2. All NRCs are required to plot or obtain the following additional information at the request of the customer:

   a. Zone I and Zone II prediction of fallout (Stanag 2103 NBC).

   b. Damage estimation details for specific locations (NWEC).

   c. Arrival times of fallout at certain locations.

   d. Estimated fallout intensities at certain locations.

   e. Actual fallout intensities at certain locations. A list giving details of the locations c, d, and e is available at each NRC.

   f. Estimated fallout intensities at other locations in UK.

   g. Actual fallout intensities at other locations in UK.

   h. Initial predictions and estimates of dose rates on hot lines.

   i. DR24, 36, 48 etc.

   Consultation for this UKWMO service to be provided should be conducted with the Chief Warning Officer at the parent Group/Sector Control.

3. INITIAL PREDICTION TEMPLATES

   Initial Prediction Templates are to be prepared in accordance with the current operating procedures and Meteorological Message (MM) Hot Line bearings and wind speeds are to be used where available; EDM information may be used for areas not covered by MM. Whichever weather data is used a full comparison should be made of MM and EDM, and trends studied on the Portable Wind Flow Chart.

4. NUCLEAR BURSTS

   All bursts are to be plotted in accordance with current procedures.

5. INITIAL PREDICTIONS

Initial Predictions should be plotted using hot lines and showing up to three hours prediction of fallout (Zone I is ignored at this stage). H + 1, + 2, + 3 are not plotted but full hour lines are, eg 1400, 1500, 1600 etc. This provides a common base for all Hot lines and easier comparison with threat information. Hot lines are plotted using a triangulation style protractor. Hour lines are inserted using the Wind Speed Proportional Scale (See Appendix 1). The current forecast of wind speed and direction is to be used which is applicable to the Sector (MM) or UK Area (EDM).

6. CUSTOMER QUERIES

Queries raised by the customer could be raised verbally or preferably, by the use of Customer Query Form (see Appendix 2). The Team Officer will answer queries from examination of his own displays or by reference to data in store. Questions outside his capability to answer should be referred to the Chief Warning Officer at the parent Group/Sector Control. Answers can be determined from the Display A by:

a. Analysing the hot line presentation

b. Applying the appropriate Zone I template temporarily to the display

-or-

c. On complicated fallout patterns applying template data onto the display itself

7. THREAT INFORMATION

All fallout threat information (TT) is to be plotted in accordance with current procedures.

8. SUBSEQUENT PREDICTIONS

a. Once TT are plotted, compare the actual fallout with initial prediction hot lines. Do not alter the initial prediction until after the second hours TT is received. Maintain two hours of hot line forecast ahead of the actual fallout front (see Appendix 1).

b. If, after receipt of the second hours actual (TT) the forecast needs modification, assess a revised wind bearing and speed, if possible by UK areas and not by individual plumes. Consideration in the revision should include an appreciation of the current forecast, the next forecast and current actual data.

c. Erase the initial prediction hot line and put the new hot line ahead of the actual fallout plume. Plot at least 2 hours of subsequent forecast.

d. Continue the system of plotting actuals and extending hot line predictions ahead of actual plume, modifying again as necessary.

NOTE: This simpler hot line procedure enables quicker and easier modification and amendments to be made to the forecast. Whereas under the current system of making up specific templates from EDM information if the actual does not correspond with the forecast, then the templates are of limited use. This is where the library of templates will be useful by allowing for the selection of the appropriate

template for the revised forecast.

9. CUSTOMER QUESTIONS ON SUBSEQUENT PREDICTIONS

All the principles of para 6 apply. Queries will normally cover:

a. Time: Answers are given using hot line times, scale and current wind speeds.

b. Location: Use is made of the prediction templates

c. Dose rate predictions: Use is made of hot line dose-rate rate graphs (see para 11)

10. DAMAGE ESTIMATION

NRCs may be requested provide damage estimation for certain BB's. This can be done using the NWEC.

11. ESTIMATED HOT-LINE RADIATION INTENSITY

When required, the Hot-line fallout maximum dose rate for a specific location may be calculated using the graph E13. Instructions for use are printed on the graph.

12. First Fallout, Subsequent arrival times and dose-rate levels for selected locations.

If the location is within the NRC's Home Sector, this information can be extracted from FF, LL and CC messages, respectively (using nearest UKWMO monitoring post(s)). If the location is outside the Home Sector the information should be obtained by liaison with the Chief Warning Officer.

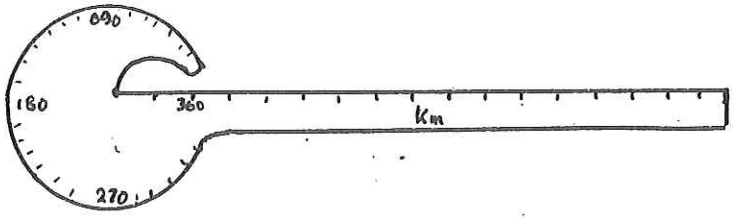
13. Hot-Line DR7 Information

When required, the Hot-Line DR7 may be calculated using the Hot-Line DR7 graph E14. Instructions for use are printed on the graph. DR7 for specific locations within the Home Sector may be available by reference to RR Messages (nearest Post), or otherwise obtained by liaison with the Chief Warning Officer.

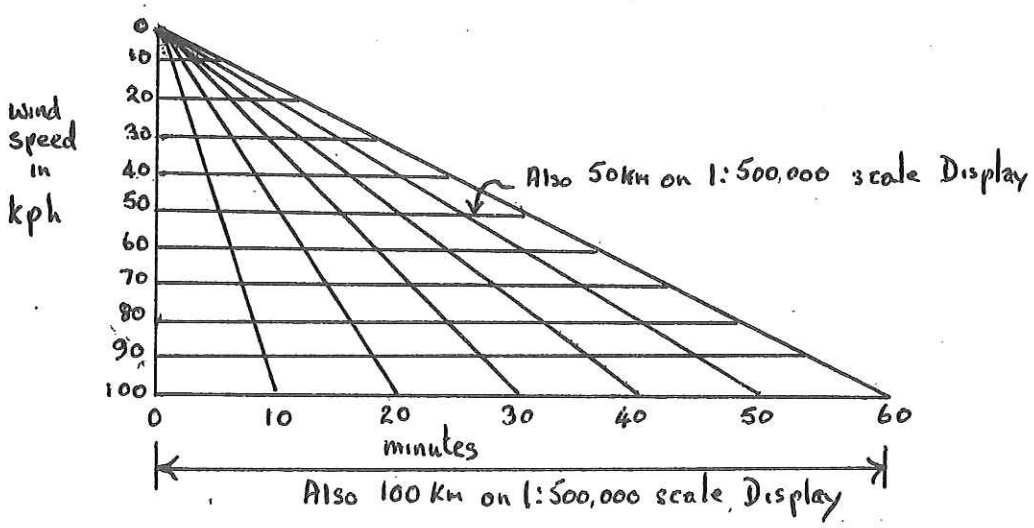
APPENDIX 1 TO ANNEX 'A'
OF ROC/151/3/AIR
DATED 1 SEPTEMBER 1981

1. HOT LINE PREDICTION

a. Hot Line protractor: As used for triangulation but calibrated in km to scale of Display 'A' (1/500,000)



b. Wind Speed Proportional Scale



c. Method of plotting Hot Line Prediction:

(1) Select hot line bearing appropriate to weapon power by reference to MM or EDM

(2) Using protractor plot bearing from Ground Burst position striking a line at least H + 3 long (3 x wind speed)

(3) Take up Wind Speed Proportional Scale. Place '0' minute line on burst position and windspeed lines parallel to hot line plotted.

(4) Slide scale up until appropriate wind speed line is coincident with hot line.

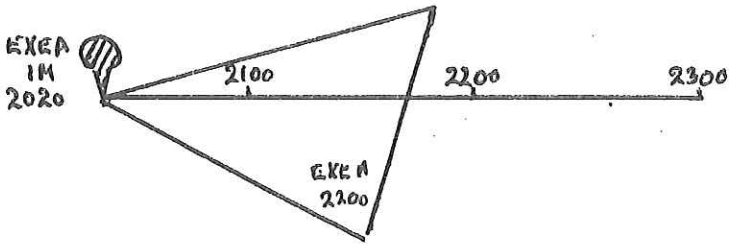
(5) Mark display at point where wind speed line crosses minute to next full hour and plot full hour time (see example below)

(6) Take up protractor or scale and scale off 2 more full hours of wind travel and plot full hour times.

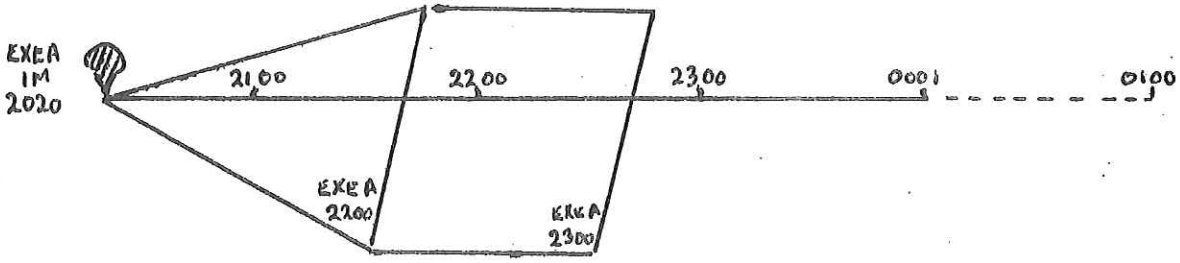
EXAMPLE: Time of burst is 2020 hours, first full hour will be 2100 hour, ie. 40 mins. after burst. Wind speed is 30 kph

2. SUBSEQUENT PREDICTIONS

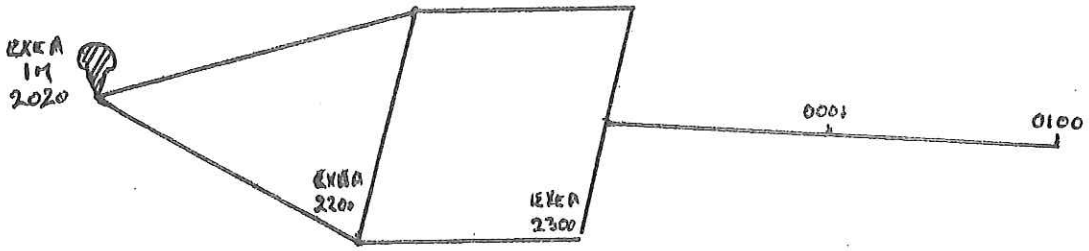
a. First TT plotted:



b. Second hour TT plotted:



c. Subsequent prediction after second hour TT:



NOTE: New subsequent prediction based on a judgment of actual and forecast wind directions and speeds for all plumes in the UK Area concerned. Generally amendments should not be made on an individual plume basis.

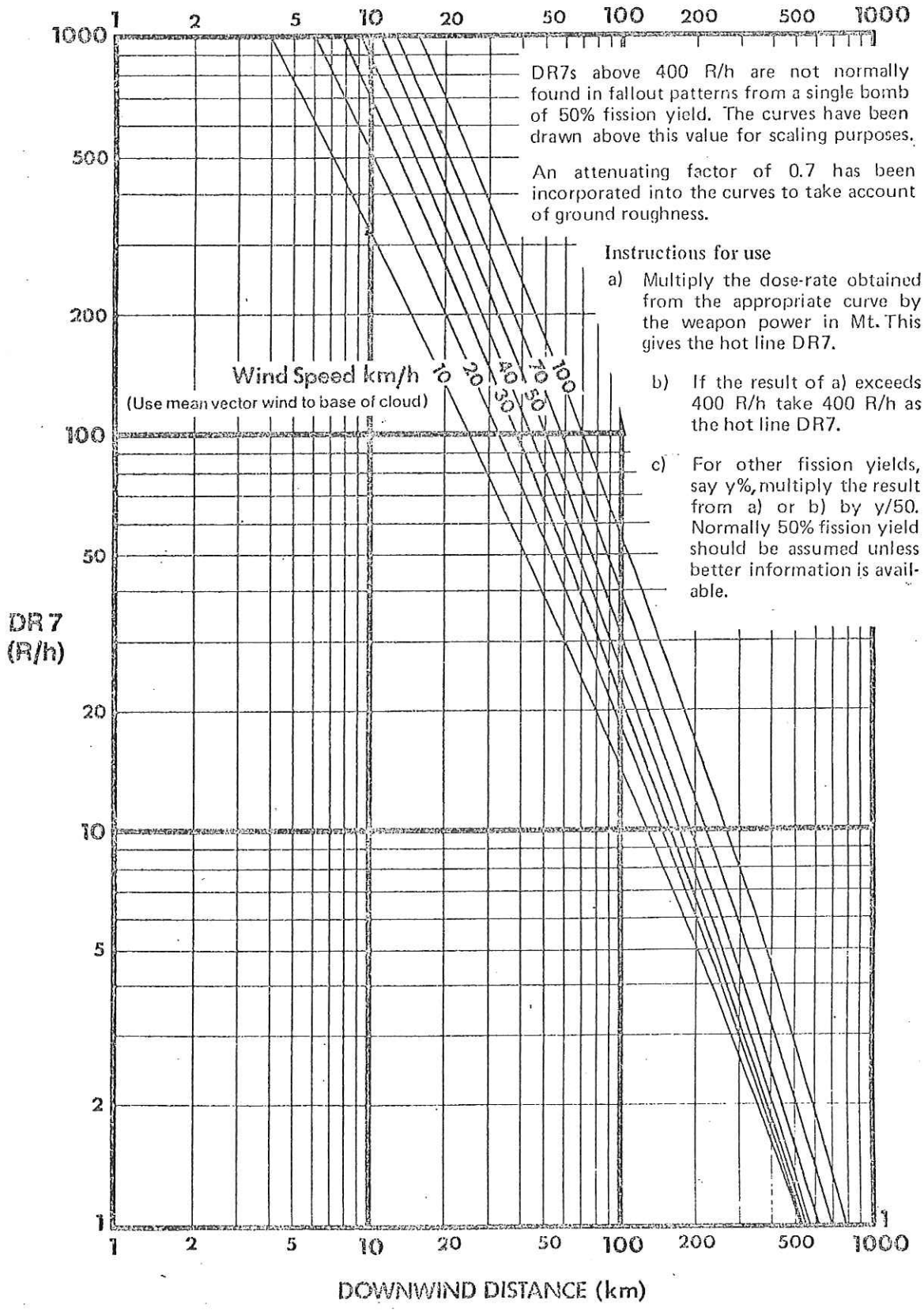
APPENDIX 2 TO
ANNEX A OF
ROC/151/3/AIR
DATED 1 SEPTEMBER 1981

FORM CUSTOMER QUERY - NRCs

CUSTOMER QUERY MESSAGE	
TO NRC OFFICER	TIME OF REQUEST .....
DETAILS OF QUERY	
DEADLINE FOR REPLY.....	ORIGINATOR..... TIME REFERRED TO GROUP.....
ANSWER FROM NRC/UKWMO	
TIME REPLY GIVEN TO CUSTOMER.....	INITIALS OF NRC OFFICER.....

HOT-LINE DR7

For a 1MT, 50% fission yield, groundburst bomb, for different wind speeds.



DR7s above 400 R/h are not normally found in fallout patterns from a single bomb of 50% fission yield. The curves have been drawn above this value for scaling purposes.

An attenuating factor of 0.7 has been incorporated into the curves to take account of ground roughness.

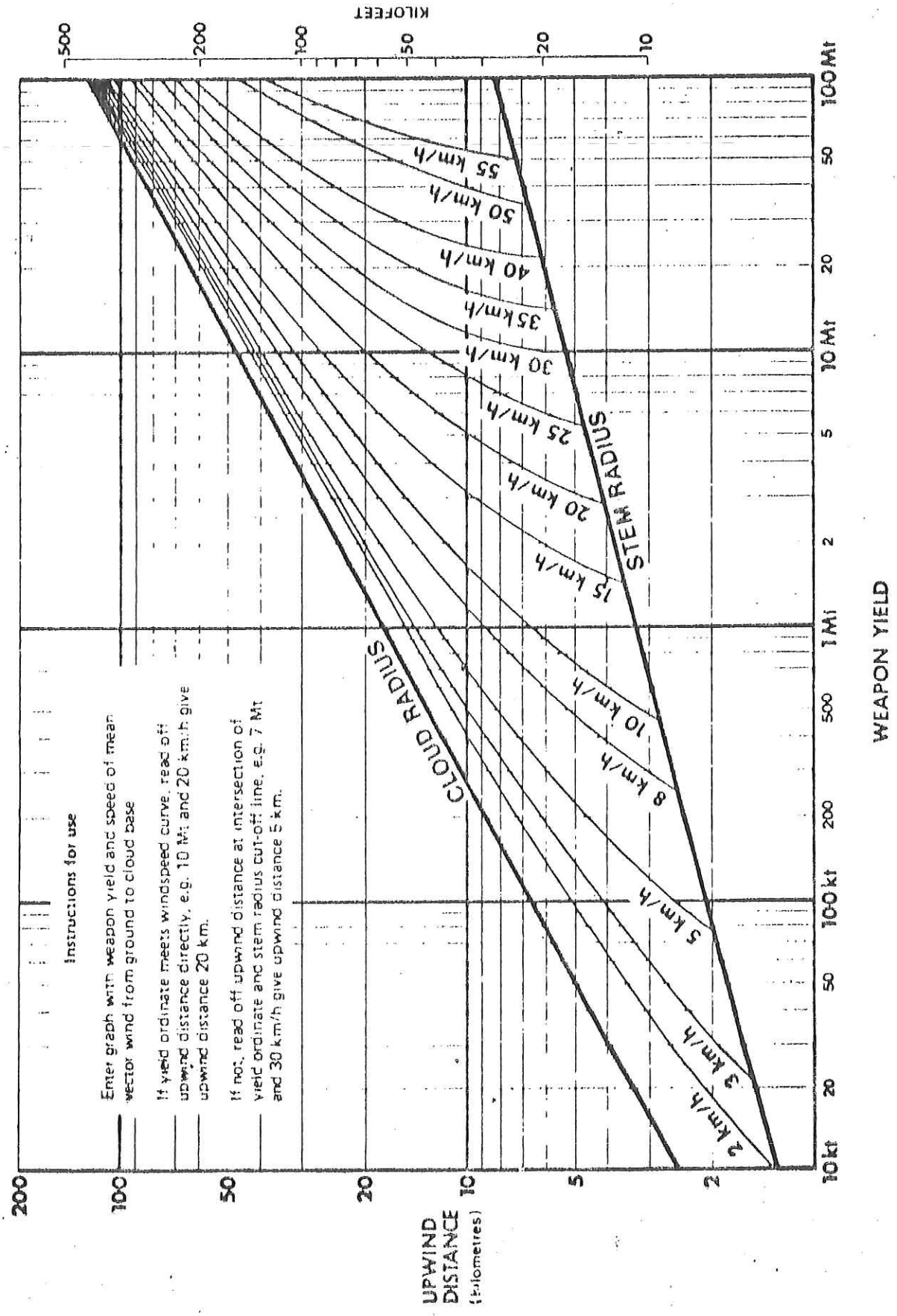
Instructions for use

a) Multiply the dose-rate obtained from the appropriate curve by the weapon power in Mt. This gives the hot line DR7.

b) If the result of a) exceeds 400 R/h take 400 R/h as the hot line DR7.

c) For other fission yields, say y%, multiply the result from a) or b) by y/50. Normally 50% fission yield should be assumed unless better information is available.

MAXIMUM LIKELY UPWIND DISTANCES OF FALLOUT FOR VARIOUS WINDSPEEDS AND YIELDS



STABILISED CLOUD DIMENSIONS