

From: P.BOURDILLON (NHS222) Delivered: Fri 16-Sep-88 15:41 BST Svs 1  
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To: General Managers of:  
Regional Health Authorities )  
District Health Authorities ) for action  
Social Health Authorities for the )  
London Postgraduate Teaching Hospitals )  
FPCs - for information

September 1988

\*\*\* ADVANCED COPY BY TELECOM GOLD MINUS APPENDICES 2 AND 3 \*\*\*

Dear General Manager

COSMOS 1900  
Nuclear Powered Satellite

This guidance will be cancelled on 31 December 1988 unless notified separately.

#### Summary

2. This EL informs HAs of the return to earth of the above Soviet satellite around the beginning of October: so that contingency plans can be updated against the remote possibility that the UK is under its final orbit.

#### Action

3. General Managers are asked to

3.1 Bring this urgently to the attention of

- a) Health Emergency Planning Officers;
- b) Chief Ambulance Officers;
- c) Medical physics departments  
(especially participants in NAIR);
- and d) others who may need to plan for  
or undertake the response below.

3.2 Prepare to

3.2.1 Provide advice and/or monitoring for persons who may have, or believe they have, been exposed to radioactivity either in this country or abroad.

3.2.2 Deal with queries from the public on the health implications of this country being affected.

3.2.3 Decontaminate and treat anyone contaminated.

3.3 RHAs give the Doh details of the officer(s) who can be contacted (including in silent hours) in order to activate the arrangements at 3.2.1 and 3.2.2 above.

3.4 RHAs give the DoH the details of officers co-ordinating the activities at 3.2.1 and 3.2.2. It differs from 3.3. Advice on these roles is set out in paragraph 1 and onwards.

3.5 Establish liaison with Chief Constables, Chief Fire Officers, Chief Executives and County Emergency Planning Officers in order to co-ordinate contingency plans.

#### Background

4. The Soviet authorities lost control of the satellite in April 1985 and it has been gradually losing height since then. It was originally estimated that the satellite would re-enter the atmosphere in August or September this year, but current estimates suggest it will return to earth in the first week of October, plus or minus a few days.

5. COSMOS 1900 has two automatic safety systems on board designed to prevent any danger of radioactive contamination should the satellite malfunction. The first of these comes into operation if the satellite becomes unstable and boosts the nuclear reactor core into a much higher orbit at which it can decay safely over hundreds of years. The second operates as a result of increase in temperature as the satellite moves through the upper layers of the atmosphere, and would separate the reactor core from the remainder of the satellite with the intention that the core would completely burn-up and be dispersed throughout the atmosphere with no significant increase in radiation level on the earth's surface. If the safety systems operate, the satellite will present no radiation hazard and should mostly burn-up on re-entry, but it is conceivable that some non-radioactive fragments may reach the earth's surface.

6. If the safety systems do not operate, there could be radioactive contamination either in a single area, if the reactor core were to come down mainly in one piece, or radioactive particles spread over a very wide area if the satellite breaks up and partially burns up on re-entry - debris from COSMOS 954, which fell over Canada in 1978, covered an area of some 1,000 km by 120 km.

7. The satellite's orbit lasts 90 minutes and covers the earth's surface between latitude 65 north and 65 south. In practice this means that almost all inhabited parts of the world are potentially at risk from COSMOS 1900's re-entry and the UK is neither more nor less at risk than any other part. Statistically, there is about a one in 2,000 chance of the UK being directly affected, but there would be a higher chance of the UK being affected by particles subsequently drifting to earth after the satellite has disintegrated in the atmosphere.

8. Contingency plans exist for an incident of this sort and are published in the Home Office Emergency Planning Guidance to Local Authorities (a copy of the relevant section is at Appendix 1). The police have the responsibility for collating information relating to possibly dangerous debris, and expert assistance is available through the National Arrangements for Incidents Involving Radioactivity (NAIR) scheme. See Part V to Appendix 2.

9. The plans allow for overall responsibility for measures necessary to deal with such an incident to be exercised from a central control point in Whitehall. This would co-ordinate assistance provided by various Departments in accordance with their responsibilities and the resources and expertise they can make available to meet the needs of any particular incident.

10. The track of the final orbit of COSMOS 1900 can only be

10. The track of the final orbit of COSMOS 1900 can only be predicted some 12 hours before it occurs. At that point, if the UK is under the final orbit, Health Authorities will be informed and public announcements will be made. At present, though, this remains a remote possibility.

#### Health Service Response to Nuclear Incidents

11. A comprehensive circular consolidating and updating previous advice - HC(76)52 and HC(85)24 - is out for consultation. This covers the roles expected of HAs as a consequence of an overseas or UK accident. General advice on the possible roles of HAs in relation to COSMOS 1900 draws on elements of this material which is issued on an interim basis. The Annex to the draft circular is therefore attached as Appendix 2. Not all the advice will be directly applicable but will need to be adapted to meet the nature of the effects, if any, on the UK of COSMOS.

#### Monitoring

12. See Part I paragraphs 1.4 - 1.8.

#### Public Information

13. See Part I paragraphs 1.10 - 1.11 and Part IV.

#### Decontamination/Treatment

14. See Part III.

15. Since the action to designate hospitals will not have been taken, an update of Appendix 2 and Appendix 3 HC(76)52 is attached which reflects our understanding of the hospitals ready to perform these tasks.

#### DHSS Contacts

16. Information on telephone extensions, FAX machines and out of hours numbers will be given to designated contacts. Details of RHA/DHA contacts should be sent by FAX to HS1 on 01-407-2752 (Room A406 Alexander Fleming House).

M A HARRIS  
Health Services Division 1

Extract from Home Office Emergency  
Planning Guidance to Local Authorities

SATELLITE ACCIDENTS - NUCLEAR-POWERED/NUCLEAR MATERIALS

Features of a satellite accident

1. It is difficult to make firm assumptions about the features of a satellite accident. A major problem is the difficulty of predicting the point of return to earth. Changes in the orbital pattern which might lead to a premature return to earth should be known many hours, possibly even days, before re-entry, but it would still not be possible to make an accurate prediction of the final orbit over the earth until 12-24 hours before impact. Even then forecasts of the precise point of re-entry might still be within a range of thousands of kilometres. It is therefore probable that accurate warning would not be available until a few minutes before impact, and possible that there might be no warning at all.

2. On re-entry into the earth's atmosphere, the behaviour of the satellite would largely be determined by its construction. Some satellites are designed in such a way that they will disintegrate on re-entry; others are so designed that fairly large components will remain intact on entering the earth's atmosphere. Debris might thus vary from minute dust particles to heavy and sizeable objects. The latter might include the radioactive source - but any part of a nuclear-powered satellite, or one containing radioactive materials might be radioactive. The power source of a particular satellite may not be known.

3. Although the parameters of the orbit of a crashing satellite can be fairly closely defined; debris might fall over an area 2000 kilometres long by 200 kilometres wide. It would not therefore be possible to alert police forces on a selective basis: in the event of a warning that a satellite might crash in or near the United Kingdom, all police forces would have to be alerted.

4. The crash of a nuclear-powered satellite would present particular problems such as:

- a. a possible radiation hazard: the degree of which could not be determined in advance;
- b. scattered debris over a very large area, perhaps the greater part of the country;
- c. very small pieces of debris, each presenting a small radiation hazard; and
- d. no explosion on landing to assist location of the debris.

Contingency arrangements

5. If the malfunctioning of a satellite became known before it came out of orbit, the Ministry of Defence (MOD) would be responsible for the preparation of an assessment of the possible risks to the United Kingdom. A Government decision would then be sought on whether the police should be alerted and whether a public statement should be made. If such action were decided on, overall responsibility for the measures to deal with an incident

would be exercised from a central control point in Whitehall; and with Ministerial and senior official representation from all the government departments concerned. Warning to the police would be given by means of a broadcast over the Police National Computer (PNC) system. The focal point for the collection of scientific data would be the Atomic Weapons Research Establishment (AWRE), Aldermaston, which would in conjunction with the National Radiological Protection Board (NRPB) arrange for appropriate scientific and technical advice to be made available to central government and to police forces who might be involved.

6. On receipt of the warning message police forces should arrange to gather reports of debris. Chief fire officers should be informed of the warning and asked to notify the police promptly of any reports which they may receive. Fire service personnel are trained to fight fires involving radioactive sources and have a limited range of equipment for the detection of radiation: they are able to confirm the presence of some but not all types of radioactivity, and are not able therefore to say authoritatively that debris is not radioactive.

7. When reports of suspected or actual locations have been received the police should take such steps as may be needed locally to prevent people entering areas which may be dangerous because of radioactive material (see also paragraph 13 below). For advice as to the dangers of radioactivity and for the examination and disposal of suspect material they should call upon the national arrangements for incidents involving radioactivity (the NAIR scheme). Under these arrangements described in annex A the immediate attendance of a radiation expert is requested (stage 1), followed if necessary by calling out a team (stage 2). The NAIR representatives should advise local police until contact is established with, and scientific and technical advice received from, AWRE and/or NRPB under the arrangements described in paragraph 5. All persons should be told to keep well away from possible radioactive debris. Although highly unlikely, some large pieces of debris might have radiation fields of significance over distances of the order of 100 metres, and some limited evacuation might be necessary: widespread continuous contamination is, however, unlikely. Advice on the degree of evacuation required would be available in the first instance from the NAIR representatives and subsequently from representatives of the AWRE and the NRPB. In the case of damage requiring rescue or firefighting operations, the possible hazard from radioactivity must be borne in mind, but existing plans for rescue operations should be implemented unless otherwise advised by the central control point.

8. Details of all findings of material which the police have reason to believe is satellite debris should be reported immediately, together with a brief outline of the action taken by quoting unique reference numbers to identify both the police force and the materials found. Such reports should be sent via the PNC system to New Scotland Yard (from where they will be passed to the central control point) in accordance with standard proforma headings. Headings and force identification codes have been provided separately to the police. This will enable a nationwide picture of confirmed sightings to be built up and consideration to be given to the need for specialist assistance. The central control point will pass the reports received to the scientific data centre at AWRE (paragraph 5 above). If debris is expected over a considerable area of the country it may be necessary to set up a field of operations centre to provide overall direction of both land and air searches. This centre would operate within general directions provided by the central control point. Special communications equipment available at the central control point could be deployed locally if there were a need to reinforce facilities in particular areas.

9. If the warning time was only a matter of minutes (or there was no warning), clearly it would not be possible to alert police forces before reports of falling debris began to come in. A PNC broadcast would, however, be sent as soon as possible and a subsequent message would confirm that the central control point arrangements had been established. The reports required under paragraph 8 above should then be passed immediately to the control point.

10. If there was no warning, the first indication that a satellite had crashed might be reports to the police of debris. Such reports might prove to be false, or it might be possible to establish immediately that the debris could not have come from a satellite. Whenever a report of debris has been confirmed, however, the action outlined in paragraph 7 above should be taken from the duty officer on 01-270-0212 or 0110 should be notified immediately. Action would then be taken to bring the central control point arrangements into operation if necessary.

#### Search for unreported fragments

11. Since much of the debris could be very small, unnoticed irradiated debris might be scattered over an area of thousands of square kilometres. A major search operation might have to be mounted to locate radioactive fragments. Whether to mount a search, and if so what area should be covered, would be decided by the central control point. Using the framework of the NAIK scheme, arrangements would be made to deploy all available technical support resources, including teams from MOD, NRPB, United Kingdom Atomic Energy Authority (UKAEA), British Nuclear Fuels (BNF) and the electricity generating boards, and specialist aircraft and vehicle search techniques. In rural areas the most effective initial search to locate major sources of radioactivity might be from the air. Police forces would be asked to organise ground searches of specific areas under arrangements by the central control point or forward operations centre, and with the advice of AWRE and NRPB staffs.

#### Recovery of fragments

12. Special arrangements would be made centrally under AWRE advice for the recovery of all fragments, when they had been located and examined, and these would be notified to the police forces concerned. Where, in the interests of public safety, and on scientific advice, a fragment is removed from the point of impact, the central control point should be informed where it is to be stored while awaiting recovery.

#### Press and publicity

13. It is essential that those dealing locally with a satellite accident and the government team in Whitehall should be in good contact. Chief officers should ensure that all press enquiries are directed to a senior officer at force headquarters, who is briefed to deal with them, working in close liaison with government information officers who would make arrangements to co-ordinate the national dissemination of information from Whitehall.

#### Extra costs

14. International law makes provision for a country in which a satellite falls to be reimbursed for any damage and other costs arising from the incident. In order to establish facts and

enable costs to be calculated for inclusion in any claim submitted by the United Kingdom. Police forces (and fire and local authorities) should keep a record of all debris found and all action taken from the receipt of the warning message (or, if no warning message is given, from the receipt of the first reports of falling debris) until the incident is closed.

#### Claims procedure

15. The Government is under an obligation to consider claims from the general public for injury or death following a nuclear accident and there is a registration procedure in existence for this purpose. A Government announcement would be made about how to obtain claim registration forms.

#### Inquiries

16. Messages addressed to the central control point should be confined to operational matters concerning the search for debris, public control etc. Any enquiry about administrative matters consequent on operations should be addressed to the Home Office, F6 Division by telephone (Tel No. 01-273-3221) or by Telex. (Telex No. 24986 H0H60AG; the additional number 91944 (answer back code H0H00CG) may be activated to handle such messages exclusively if need arises).

Action Required: