LEAFLET 14

INVESTIGATION, NOTIFICATION AND REPORTING OF UNUSUAL RADIATION EVENTS

CONTENTS

SCOPE

1 Unusual radiation events such as radiation accidents, incidents and occurrences may occur from time to time. Depending on the precise nature of the event, MOD policy requires the event to be investigated, notified and reported to a number of MOD addressees. In addition, there are statutory obligations to notify and report to external regulatory bodies and to carry out investigations into some of these events. This Leaflet details the criteria and procedures for investigation, notification and reporting of these unusual events. The criteria considered are radiological criteria only and the scope of this leaflet does not extend to other non-radiological reporting requirements (e.g. for fire, explosion, injury).

STATUTORY REQUIREMENTS AND PARALLEL ARRANGEMENTS

2 In addition to the general requirements of the Health and Safety at Work etc Act 1974 and the Management of Health and Safety at Work Regulations 1999, the following specific legislation applies directly or is applied indirectly through parallel arrangements designed to achieve equivalent standards:

- Ionising Radiations Regulations 1999 (IRR99) (apply directly);
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (apply directly);
- Radioactive Substances Act 1993 (RSA93) (parallel arrangements).

DUTIES

Commanding Officer and Head of Establishment (CO/HoE)

3 The CO/HoE has a duty to the Secretary of State, and a personal responsibility, to protect the environment and secure the health, safety and welfare of their staff at work. The CO/HoE is also required to protect persons not in MOD employment (e.g. members of the public) against risks to their health and safety arising from the MOD work activities. This includes radiation safety. The CO/HoE's authority (but not responsibility) for radiation safety management arrangements may be delegated to appropriate personnel, such as a Radiation Safety Officer (RSO).

Radiation Safety Officer (RSO)

4 The Radiation Safety Officer (RSO) is to ensure that:

4.1 Requirements for investigation, notification and reporting of unusual radiation events are promulgated in local orders (Leaflet 16);

4.2 Investigation, notification and reporting are carried out in accordance with this Leaflet, consulting the RPA as directed by the CO/HoE.

Radiation Protection Supervisor (RPS)

5 The RPS should normally carry out the investigation and prepare the report as directed by the RSO.

Workplace Supervisor (WPS)

6 In units where it is unnecessary to appoint an RPS, a WPS may need to be appointed with duties to ensure that work is carried out in accordance with local orders for radiation safety (see Leaflet 16).

Employees

7 It is the responsibility of all employees to ensure that they immediately report any unusual or unexpected radiation event or exposure, affecting themselves or others, to the local RPS or WPS. Near misses must also be reported (i.e. an unusual event which could have given rise to an exposure but, by chance, did not).

UNUSUAL RADIATION EVENTS

8 A radiation accident is defined in IRR99 as an accident that requires immediate action to prevent or reduce the exposure to ionising radiation of employees or any other persons. Radiation accidents and other incidents and occurrences could lead to exposure of personnel and/or the release or loss of radioactive material. Decisions on whether such events require to be investigated, notified and reported depend on both the type of event and radiological criteria such as dose level or activity level involved in a release or loss – immediate RPA advice is to be sought in cases of doubt. The different types of event which require investigation and reporting are as follows:

Notifiable to MOD and to external authorities:

8.1 Overexposure i.e. any exposure of a person to ionising radiation to the extent that the dose received by that person causes a dose limit (see Leaflet 4) relevant to that person to be exceeded;

8.2 Release of radioactive material into the atmosphere as a gas, aerosol or dust where such release is not in accordance with a notification or approval from the appropriate environment agency (see Leaflet 3); or within the terms of the conditions of an Exemption Order. This category could include a release from a fire or explosion;

8.3 Spillage of radioactive substances, or radioactive substances otherwise released, in such a manner as to give rise to contamination (i.e. in excess of the relevant level at Annex F);

8.4 Loss or theft of a radioactive substance;

8.5 Malfunction of equipment used for medical or dental exposure;

8.6 Failure of industrial radiography or irradiation equipment to de-energise or return to its safe position after the intended exposure period.

Notifiable to MOD but not to external authorities:

8.7 Unusual radiation incident - this category covers the events which do not meet the reporting criteria for any of the above externally reportable categories but which still need to be reported to MOD authorities. Examples of an unusual radiation incident are unexpected radiation exposure below the level of an overexposure, a release of material below external reporting levels, ingestion of radioactive material, contaminated wound, fixed skin contamination or a near miss (i.e. an unusual event which could have given rise to an exposure, release or loss but, by chance, did not).

9 The sections which follow set out the criteria for each type of unusual radiation event and instructions as to the investigation, notification and reporting procedures to be followed. Further guidance is provided at the Annexes to this leaflet.

INITIAL ALERTING REPORT FOR UNUSUAL RADIATION EVENTS

10 Any unusual radiation event coming into any of the categories described below, involving possible loss or release of radioactive material or unplanned excess radiation exposure is to be subject to an immediate alerting report to the appointed RPA for the unit or establishment, the appropriate TLB safety authority (e.g. the Chief Environment Safety Officer (CESO) for the TLB area), Occupational Health and Safety and Radiation Protection team at SSD&C (OHS & RP) and the relevant unit's chain of command. The initial report is to be made by signal or telephone (confirmed by signal) unless otherwise specified by the authorities concerned. Signal indicator code (SIC) **SQY** (radiation safety) is to be used. Signal addressees are listed at Annex A. Requirements for investigation, reporting and notification are given below supported by detailed information at the Annexes to this leaflet.

INVESTIGATION, NOTIFICATION AND REPORTING REQUIREMENTS FOR UNUSUAL RADIATION EVENTS

Radiation overexposure

11 An overexposure is an exposure of a person to ionising radiation to the extent that the dose received by that person causes a dose limit relevant to that person to be exceeded (see Leaflet 4). Where the CO/HoE suspects or has been informed that any person is likely to have received an overexposure as a result of work carried out at the unit, the CO/HoE shall carry out an immediate investigation. In practice, this means that the unit or establishment RPS/WPS/RSO should be detailed to carry out the investigation taking advice from the RPA as necessary. Unless this immediate investigation shows beyond reasonable doubt that no overexposure could have occurred, the CO/HoE must carry out statutory notification and follow-up investigation procedures. Detailed information on the procedures to be followed is at Annex B.

Occurrence of release of radioactive substances into the atmosphere

12 A unit or establishment RPS/WPS/RSO is to institute an immediate investigation into any release or suspected release of radioactive substances to atmosphere except those carried out in accordance with a relevant environment agency notification or approval. Where this investigation confirms the release, then the appropriate personnel at the unit or establishment, TLB safety authority and appointed RPA are to be immediately informed. Under certain circumstances, notification of authorities external to MOD is required. Copies of the investigation report are to be rendered to internal MOD authorities as directed by the TLB safety authority. Detailed information on the procedure to be followed is at Annex C.

Occurrence of spillage of radioactive substances

13 In this context, the term spillage is to be taken to include other types of release such as leakage or seepage of materials leading to the spread of radioactive contamination. A unit or establishment RPS/WPS/RSO is to institute an immediate investigation into the spillage or suspected spillage of radioactive substances except those occurring in accordance with a relevant environment agency approval. Where this investigation confirms the spillage then the appropriate personnel at the unit or establishment, TLB safety authority and appointed RPA are to be informed immediately. Under certain circumstances, notification of authorities external to MOD is required. Copies of the investigation report are to be rendered to internal MOD authorities as directed by the TLB safety authority. Detailed information on the procedure to be followed is at Annex D.

Occurrence of loss or theft of a radioactive source or radioactive substance

14 A unit or establishment RPS/WPS/RSO is to institute an immediate investigation into the loss of the radioactive source or radioactive material. Where this investigation confirms the loss then the appropriate personnel at the unit or establishment, TLB safety authority and appointed RPA are to be immediately informed. Under certain circumstances, notification of authorities external to MOD is required. Copies of the investigation report are to be rendered to internal MOD authorities as directed by the TLB safety authority. Detailed information on the procedure to be followed is at Annex E.

Malfunction of equipment used for medical or dental exposure

15 Where the CO/HoE suspects or has been informed that an incident may have occurred in which a person while undergoing a medical exposure was, as the result of a malfunction of, or defect in, radiation equipment under the control of that CO/HoE, exposed to ionising radiation to an extent much greater than intended, the CO/HoE shall carry out an immediate investigation. In practice, this means that the CO/HoE of the unit or establishment must detail the RPS/RSO to carry out the investigation taking advice from the RPA as necessary. Unless this immediate investigation shows that no incident has taken place, the CO/HoE must carry out statutory notification and follow-up investigation procedures. Detailed information on the procedures to be followed is at Annex G.

Failure of industrial radiography or irradiation equipment

16 The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR 95) requires certain incidents involving industrial (site) radiography or irradiation equipment to be reported to the Health and Safety Executive. The incidents involved are:

- The malfunction of a radiation generator or its ancillary equipment used in fixed or mobile industrial radiography which results in the equipment failing to de-energise at the end of the exposure;

- The malfunction of equipment used in fixed or mobile industrial radiography which results in a radioactive source failing to return to its safe position at the end of the exposure.

17 An investigation is to be conducted by the RPS/RSO taking advice from the RPA as required and a report rendered. Detailed information on the procedures to be followed is at Annex H.

Unusual radiation incidents (not notifiable to authorities external to MOD)

18 The following unusual radiation incidents are to be investigated by the RPS/WPS/RSO with advice from the RPA as necessary and notified and reported to the appropriate MOD authorities (detailed information on the procedures to be followed is at Annex I):

18.1 Accident or occurrence likely to result in a person receiving an effective dose (i.e. whole body dose) exceeding 6 mSv or an equivalent dose (i.e. dose to eye, skin, hands, forearms, feet or ankles) exceeding three-tenths of the relevant dose limit. This unusual radiation incident also carries statutory dosimetry assessment and record keeping requirements (see Leaflet 6). Note that if the dose received constitutes a radiation overexposure it is to be investigated, notified and reported in accordance with paragraph 11;

18.2 Effective dose (i.e whole body dose) accumulated from routine external and internal radiation exposure, exceeding the formal investigation level (see Leaflet 4). Note that if the dose received constitutes a radiation overexposure it is to be investigated, notified and reported in accordance with paragraph 11;

18.3 Any intake of radioactive material by ingestion;

18.4 Any fixed skin contamination greater than 3 Bq cm^{-2} for α-emitters and 30 Bq cm^{-2} for β and γ-emitters remaining after 24 hours;

18.5 Any contaminated wound;

18.6 Any release of radioactive material to atmosphere or spillage of radioactive material which is below the levels prescribed for notification of external authorities (e.g. HSE, environment agencies). Note that releases or spillage at levels above those prescribed are to be investigated and reported in accordance with paragraphs 12 and 13 respectively and their supporting annexes;

18.7 Any near miss i.e. an unusual event with the potential to cause unplanned radiation exposure, or a release or spill of radioactive material to the environment or the loss of radioactive substances but where these events did not, by chance, actually occur. Note that specific types of malfunction of equipment associated with industrial radiography require to be investigated and reported in accordance with paragraphs 16 and 17;

18.8 An incident likely to generate press or media interest.

NATURE OF AN IMMEDIATE INVESTIGATION

19 An immediate investigation into any unusual radiation event is to be conducted by the RSO/RPS/WPS of the unit or establishment on behalf of the CO/HoE, unless alternative arrangements are made. The main purpose of the immediate investigation is to rule out suspected accidents, incidents or occurrences which it can be readily shown did not take place. Also, the immediate investigation is to collect temporal details and information which may be lost due to the passage of time. In cases where a exposure cannot be excluded, reviews intended to refine the initial estimate or assessment of dose received are not part of the immediate investigation. Such are to be carried out, if appropriate during the detailed investigation which follows.

20 Once the immediate investigation has been completed, the need, or otherwise, for a report to MOD authorities and, in some cases, external authorities will be evident. The RPA is to be consulted regarding the aspects which are to be covered in a detailed or follow-up investigation (see below).

NATURE OF A DETAILED OR FOLLOW-UP INVESTIGATION

21 Detailed investigations into unusual radiation events are to be conducted by the RSO/RPS/WPS of the unit or establishment on behalf of the CO/HoE, unless alternative arrangements are made such as the setting up of a Service Inquiry. The RPA is to be consulted.

22 The unusual radiation event is to be thoroughly investigated to determine the extent of the radiation hazard, level of radiation exposures and the causes of the event including the less obvious contributory causes, and to recommend safeguards to prevent its reoccurrence.

23 Reports of investigations into unusual radiation events are to contain all the relevant facts, including the following details where applicable:

23.1 Time and location;

23.2 Names of persons involved, work routine and duties being performed at the time;

23.3 Description of any equipment involved;

23.4 Summary of relevant local orders, work instructions, safety documents, equipment manuals and maintenance programmes covering the work undertaken at the time or the equipment involved;

23.5 Full description detailing the sequence of events including adherence to local orders, work instructions, safety documents, equipment manuals and maintenance programmes;

23.6 Results of any radiation or contamination survey for the areas concerned during the period under investigation.

23.7 Results of any special surveys or measurements taken (e.g. during a reconstruction advised by the RPA);

23.8 In the case of an exposure (or overexposure) recorded on a dosemeter, consideration as to whether the dosemeter could have been left in a radiation area (i.e. exposed whilst not being worn) or worn whilst the employee underwent a medical exposure;

23.9 Where relevant, estimated quantities of radionuclides involved, estimates of quantities released and spread of contamination both airborne and surface;

23.10 Estimated (or measured) external dose, level of bodily surface contamination or intake of radionuclide(s), together with details of results of measurements and laboratory analyses – to include employees and any other persons involved;

23.11 Immediate action taken to lessen the consequences;

23.12 Medical action taken, including suspension from radiation work;

23.13 Training, instruction or information received and general competence for the work undertaken;

23.14 Direct and/or indirect cause;

23.15 Views of relevant safety representatives or safety committee;

23.16 Recommendations for future preventive measures.

RADIATION PROTECTION ADVICE

24 Radiation protection advice for units and establishments is to be obtained from the appointed RPA. For those units and establishments for which Dstl ESD is appointed as the Radiation Protection Adviser, radiation protection advice is available 24 hours by telephoning:

- During working hours 02392 768130;
- During silent hours 02392 768020 and asking for the Duty Health Physicist;
- Or by email: esdsupport@mail.dstl.gov.uk

RADIATION MEDICINE ADVICE

25 Radiation medicine advice is to be obtained from the Radiation Medicine Section at the Institute of Naval Medicine, Alverstoke, Gosport, Hants, PO12 2DL, the tri-service focal point for such advice, or by telephoning:

- During working hours 023 9276 8085 or 8026;
- During silent hours 023 9276 8020 and asking for the Duty Radiation Medicine Specialist;
- Also, fax on 023 9250 4823

  e-mail smorm@inm.mod.uk

  e-mail aoumd@inm.mod.uk

ACCIDENT AND INCIDENT REPORTING SYSTEM

26 In addition to the investigation, notification and reporting procedures described above, all unusual radiation events are to be reported using points of contact. They can be found at:

http://defenceintranet.diiweb.r.mil.uk/DefenceIntranet/PeopleServices/HealthWellBeingAndSickness/ReportingWorkRelatedAccidents/

For those not having access to the intranet they should contact the Chief Environment and Safety Officer within their TLB. When JSP 375 is revised and published (post 2007) this should contain the latest information and should be used.

RECORDS

27 Records of investigations into unusual radiation events are to be retained by the establishment for at least 50 years and in the case of radiation exposures retained until the person involved would have reached the age of 75 years if this is later. Where an investigation showed that no unusual radiation event had actually occurred, the retention period is a minimum of 2 years, after which period, an assessment on the relevance of retaining the document is to be made in accordance with MOD policy at Volume 1 Chapter 11.

RELATED LEAFLETS

28 Leaflets referred to within this leaflet are shown in Table 1.

Table 1 Related Leaflets

Leaflet Number	Leaflet Title
3	Application for Permits (Notification or Approval) and agreement to the introduction and use of sources of ionising radiation including radioactive substances
4	Restriction of exposure to radiation
6	Dosimetry and personal dose records including medical surveillance of classified persons
16	Local orders for radiation safety

LEAFLET 14 ANNEX A

SIGNAL ADDRESSEES FOR NOTIFICATION OF UNUSUAL RADIATION EVENTS

Addressee	Comments
CINCFLEET for CESO(RN)	RN units only
FLEET HQ for RADPOL(SM)	RN units only
HQLF for CESO(A)	Army units only
HQPTC RAF High Wycombe for CESO(RAF)	RAF units only
Dstl Alverstoke for Dstl	For units using Dstl ESD as RPA
MODUK DE&S for DNSR	For events involving nuclear material or events on nuclear sites
MODUK for DSC ADNAR	For events involving nuclear material or events on nuclear sites
MODUK DE&S for CESO(DE&S)	All
MODUK DE&S for CDM	All
MODUK for DSC HPAD	All (information only)
INM ALVERSTOKE	All - for cases involving suspected or confirmed overexposure or contamination of personnel and where radiation medicine advice may be required.

Signal Indicator Code (SIC) **SQY** (Radiation Safety) is to be used.

Suggested Signal Formats:

SIGNAL ONE. SIC: H9D/SQY

SUBJECT: **RADIOLOGICAL INCIDENT**

REF: JSP 392, Leaflet 14

1. Name of ship / Establishment.
2. Date and time of incident.
3. Nature of incident and brief description of circumstances.
4. Location of incident.
5. No of personnel exposed to external ionising radiation
6. No of personnel exposed to internal ionising radiation

SIGNAL TWO. SIC: H9H/SQY

SUBJECT: **LOSS OF RADIOACTIVE SOURCE**

REF: JSP 392, Leaflet 14

1. Name of Ship / Establishment.
2. Date and time loss discovered / occurred.
3. Type of source and/or radioactive material.
4. Radioactive nuclide(s) and nominal activity.
5. Serial number.
6. Brief outline of circumstances of loss

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LEAFLET 14 ANNEX B

INVESTIGATION, NOTIFICATION AND REPORTING OF RADIATION OVEREXPOSURE

1 Following any suspected or actual overexposure carry out an immediate investigation as detailed in this leaflet.

2 Unless the immediate investigation shows beyond reasonable doubt that no overexposure has occurred, immediately notify the following:

2.1 Appropriate personnel at the unit or establishment;

2.2 The Appointed Doctor and INM Alverstoke (by priority signal (see Annex A));

2.3 The TLB safety authority and unit's line authority by priority signal;

2.4 Dstl ESD Alverstoke (for Approved Dosimetry Service (ADS) and RPA Body) **or** external ADS and RPA (if Dstl ESD not used for either or both);

2.5 SSD&C (for information only).

3 Notify as soon as practicable:

3.1 In the case of an employee of another employer, notify that other employer;

3.2 Notify the person affected;

3.3 Local office of the Health and Safety Executive.

NOTE

Notification of external body (3.3) is only to be undertaken when MOD authorities (2.1-2.5) have been notified. Notification of the external body will **not** apply where an overexposure has occurred to a member of a visiting force. External notification will apply for the UK armed forces, MOD civilians and other persons.

4 Carry out a follow-up investigation of the circumstances of the overexposure and the assessment of the relevant dose to determine, so far as is reasonably practicable, the measures required, if any, to be taken to prevent a recurrence of such overexposure. Notify the results and forward the report of the further investigation to the authorities and individuals listed above.

5 Where the investigation shows that the exposure is below the overexposure level, then the internal MOD procedure for reporting unusual radiation incidents at Annex I is to be followed as the exposure will still be reportable internally within MOD.

6 All overexposures are to also be reported. Accident and incident reporting is to be undertaken using points of contact. They can be found at:-

http://defenceintranet.diiweb.r.mil.uk/DefenceIntranet/PeopleServices/HealthWellBeingAndSickness/ReportingWorkRelatedAccidents/

For those not having access to the intranet they should contact the Chief Environment and Safety Officer within their TLB. When JSP 375 is revised and published (post 2007) this should contain the latest information and should be used. Unusual radiation exposures below the overexposure level may still need to be reported this way (see Leaflet 14 paragraph 18).

7 Records of the immediate investigation are to be retained by the establishment for at least 2 years. The follow-up investigation report is to be retained at least until the person affected would have attained the age of 75 years but in any event for at least 50 years.

8 Where the person who received the overexposure is an employee who has a dose record, the CO/HoE must arrange for the assessment of dose to be entered into that dose record (see Leaflet 6).

LEAFLET 14 ANNEX C

INVESTIGATION, NOTIFICATION AND REPORTING OF THE OCCURRENCES OF RELEASE OF RADIOACTIVE SUBSTANCES TO ATMOSPHERE

1 Following any release or suspected release of radioactive substances to atmosphere, other than in accordance with a relevant environment agency discharge approval, carry out an immediate investigation as detailed at Leaflet 14.

2 If the release exceeds the quantity specified in Annex F, immediately notify the following:

2.1 Appropriate personnel at the unit or establishment;

2.2 The TLB safety authority and unit's line authority by priority signal. (Signal addressees are given at Annex A);

2.3 Dstl ESD and RPA (if RPA not the Dstl ESD RPA Body);

2.4 SSD&C (OHS and RP) (for information only);

2.5 Local office of the Health and Safety Executive;

2.6 Environment agencies, as appropriate, where there is a risk of environmental contamination (see also paragraph 5 below).

NOTE

Notification of external bodies (2.5-2.6) is only to be undertaken when MOD authorities (2.1-2.4) have been notified. Notification of external bodies will not apply to HM Ships, except when undergoing refit.

3 The authorities notified above are to be provided initially with the following information:

- Type of radioactive source or material;
- Radionuclides and nominal activity;
- Brief outline of circumstances of release.

4 Further details of the release, equipment and areas affected and personnel contaminated externally or internally may be required by MOD authorities to enable advice/reassurance to be provided.

5 Where the quantity is found not to exceed the relevant level in Annex F, the advice of the RPA is to be sought as to whether a report to the appropriate environment agency is still required in accordance with the terms and conditions which relate to the radioactive material that has been released. If a report to the appropriate environment agency is not required, then the internal MOD procedure for reporting unusual radiation incidents at Annex I is to be followed.

6 All releases are also to be reported via the Accident and Incident Reporting System as described in JSP 375.

7 Records of investigation reports are to be retained by the establishment for at least 50 years.

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LEAFLET 14 ANNEX D

INVESTIGATION, NOTIFICATION AND REPORTING OF THE OCCURRENCE OF SPILLAGE OF RADIOACTIVE SUBSTANCES

1 Following any spillage or suspected spillage of radioactive substances, other than in a fume cupboard or total enclosure or in a manner specified in a relevant environment agency approval to dispose of radioactive waste, carry out an immediate investigation as detailed at Leaflet 14.

2 If the spillage exceeds the quantity specified in Annex F, immediately notify the following:

2.1 Appropriate personnel at the unit or establishment;

2.2 The TLB safety authority and unit's line authority by priority signal. (Signal addressees are given at Annex A);

2.3 Dstl ESD and RPA (if RPA not the Dstl ESD RPA Body);

2.4 SSD&C (OHS and RP) (for information only);

2.5 Local office of the Health and Safety Executive;

2.6 Environment agencies, as appropriate, where there is a risk of environmental contamination (see also paragraph 5 below).

NOTE

Notification of external bodies (2.5-2.6) is only to be undertaken when MOD authorities (2.1-2.4) have been notified. Notification of external bodies will not apply to HM Ships, except when undergoing refit.

3 The authorities notified above are to be provided initially with the following information:

- Type of radioactive source or material;
- Radionuclides and nominal activity;
- Brief outline of circumstances of spillage.

4 Further details of the spillage, equipment and areas affected and personnel contaminated externally or internally may be required by MOD authorities to enable advice/reassurance to be provided.

5 Where the quantity is found not to exceed the relevant level in Annex F, the advice of the RPA is to be sought as to whether a report to the appropriate environment agency is still required in accordance with the terms and conditions which relate to the radioactive material which has been spilled. If a report to the appropriate environment agency is not required, then the internal MOD procedure for reporting unusual radiation incidents at Annex I is to be followed.

6 All spillages are also to be reported via the Accident and Incident Reporting System as described by JSP 375.

7 Records of investigation reports are to be retained by the establishment for at least 50 years.

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LEAFLET 14 ANNEX E

INVESTIGATION, NOTIFICATION AND REPORTING OF THE OCCURRENCE OF LOSS OR THEFT OR RADIOACTIVE SUBSTANCES

1 Following any loss or theft of a radioactive substance, carry out an immediate investigation as detailed at Leaflet 14.

2 If the loss exceeds the quantity specified in Annex F, immediately notify the following:

2.1 Appropriate personnel at the unit or establishment;

2.2 The TLB safety authority and unit's line authority by priority signal (signal addressees are given at Annex A);

2.3 Dstl ESD and RPA (if RPA not the Dstl ESD RPA Body);

2.4 SSD&C (OHS and RP) (for information only);

2.5 Local of the Health and Safety Executive (within 24 hours from discovery of loss);

2.6 Environment agencies (see also paragraph 4 below);

2.7 MOD Police (where applicable) and local Police.

NOTE

Notification of bodies (2.5-2.7) is only to be undertaken when MOD authorities (2.1-2.4) have been notified.

3 The authorities notified above are to be provided initially with the following information:

- Type of radioactive source or material;
- Radionuclides and nominal activity;
- Serial number;
- Brief outline of circumstances of loss.

4 Where the quantity is found not to exceed the relevant level in Annex F, the advice of the RPA is to be sought as to whether a report to the appropriate environment agency is still required in accordance with the terms and conditions which relate to the radioactive material which has been lost or stolen. If a report to the appropriate environment agency is not required, then the internal MOD procedure for reporting unusual radiation incidents at Annex I is to be followed.

5 All losses or thefts are also to be reported via the Accident and Incident Reporting System as described by JSP 375.

6 Records of investigation reports are to be retained by the establishment for at least 50 years.

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LEAFLET 14 ANNEX F

QUANTITIES OF RADIONUCLIDES FOR EXTERNAL NOTIFICATION OF RADIATION OCCURRENCES

Radionuclide	Lost or stolen (Bq)	Spillage or unauthorised release to atmosphere (Bq)
Hydrogen-3 (Tritium) elemental	1×10^{10}	1×10^{13}
Hydrogen-3 (Tritium) tritiated compounds	1×10^{10}	1×10^{12}
Chlorine-36	1×10^{7}	1×10^{10}
Cobalt-57	1×10^{7}	1×10^{11}
Cobalt-60	1×10^{6}	1×10^{10}
Nickel-63	1×10^{9}	1×10^{11}
Krypton-85	1×10^{5}	1×10^{12}
Strontium-90	1×10^{5}	1×10^{9}
Yttrium-90	1×10^{6}	1×10^{11}
Technetium-99m	1×10^{8}	1×10^{13}
Iodine-123	1×10^{8}	1×10^{12}
Iodine-131	1×10^{7}	1×10^{10}
Iodine-133	1×10^{7}	1×10^{11}
Caesium-137	1×10^{5}	1×10^{10}
Promethium-147	1×10^{8}	1×10^{10}
Iridium-192	1×10^{5}	1×10^{10}
Polonium-210	1×10^{5}	1×10^{7}
Radium-226	1×10^{5}	1×10^{7}
Thorium-232	1×10^{5}	1×10^{6}
Thorium (natural)	1×10^{4}	1×10^{6}
Uranium-238	1×10^{5}	1×10^{7}
Uranium (natural)	1×10^{4}	1×10^{6}
Americium-241	1×10^{5}	1×10^{6}

NOTE

For radionuclides not given in the table, notifiable quantities are given in Schedule 8 of the Ionising Radiation Regulations 1999, or advice is to be sought from the RPA

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LEAFLET 14 ANNEX G

INVESTIGATION, NOTIFICATION AND REPORTING OF MALFUNCTION OF EQUIPMENT USED FOR MEDICAL EXPOSURE

1 Following any suspected or actual malfunction or defect resulting in a dose to the person undergoing the medical or dental exposure much greater than expected carry out an immediate investigation as detailed at Leaflet 14.

2 Unless the immediate investigation shows beyond reasonable doubt that no incident has occurred, immediately notify the following:

2.1 Appropriate personnel at the unit or establishment;

2.2 INM Alverstoke f.a.o. Radiation Medicine Specialist (by priority signal (see Annex A));

2.3 The TLB safety authority and unit's line authority by priority signal;

2.4 Dstl ESD Alverstoke and RPA (if RPA not the Dstl ESD RPA Body);

2.5 SSD&C (OHS and RP) (for information only);

2.6 Local office of the Health and Safety Executive.

NOTE

Notification of external body (2.6) is only to be undertaken when MOD authorities (2.1-2.5) have been notified.

3 Carry out a detailed follow-up investigation of the circumstances of the exposure and an assessment of the relevant dose. Determine, so far as is reasonably practicable, the measures required, if any, to be taken to prevent a recurrence. Notify the results of the further investigation to the authorities listed above.

4 All incidents in this category are also to be reported via the Accident and Incident Reporting System as described by JSP 375.

5 Records of the immediate investigation are to be retained by the establishment for at least 2 years. The follow-up investigation report is to be retained for at least 50 years.

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LEAFLET 14 ANNEX H

INVESTIGATION, NOTIFICATION AND REPORTING OF FAILURE OF INDUSTRIAL RADIOGRAPHY OR IRRADIATION EQUIPMENT TO DE-ENERGISE OR RETURN TO ITS SAFE POSITION AFTER THE INTENDED EXPOSURE PERIOD

1 Following a malfunction as described in Leaflet 14, immediately notify the following:

1.1 Appropriate personnel at the unit or establishment;

1.2 The TLB safety authority and unit's line authority by priority signal;

1.3 Dstl ESD and RPA (if RPA not the Dstl ESD RPA Body);

1.4 SSD&C (OHS and RP) (for information only);

1.5 Local office of the Health and Safety Executive.

NOTE

Notification of external body (1.5) is only to be undertaken when MOD authorities (1.1-1.4) have been notified provided that this does not cause the reporting period specified by RIDDOR to be exceeded.

2 Carry out an investigation of the circumstances of the malfunction or defect. Determine, so far as is reasonably practicable, the measures required, if any, to be taken to prevent a reoccurrence of this failure. Report the results of the investigation to the MOD authorities listed above. Note that if this failure involves a radiation exposure the Approved Dosimetry Service (ADS) must also be provided with a copy of the report (usually the Dstl ESD ADS).

3 All incidents in this category are also to be reported via the Accident and Incident Reporting System as described by JSP 375.

4 Records of the investigation are to be retained by the establishment for at least 50 years and in the case of a radiation exposure until the person to whom the report relates would have reached the age of 75 years (if later).

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LEAFLET 14 ANNEX I

INVESTIGATION, NOTIFICATION AND REPORTING OF UNUSUAL RADIATION INCIDENTS (INCLUDING NEAR MISSES)

1 Following any unusual radiation incident, it is to be established whether the incident constitutes an overexposure, release or spillage in excess of Annex F levels, loss or theft, malfunction of equipment used for medical or dental exposure or failure of industrial radiography or irradiation equipment – if the incident fits any of the aforementioned categories then the procedures appropriate to that category are to be followed.

2 Carry out preliminary investigation and notify:

2.1 Appropriate personnel at the unit or establishment;

2.2 The TLB safety authority and unit's line authority;

2.3 Dstl ESD and RPA (if RPA not the Dstl ESD RPA Body);

2.4 SSD&C (OHS and RP) (for information only).

3 Unless otherwise directed, carry out a follow-up investigation in accordance with the procedure at Leaflet 14, taking RPA advice as necessary.

4 Render the follow-up investigation report to the line authority and TLB safety authority, copy to Dstl ESD.

5 Unless otherwise directed, all incidents in this category are also to be reported via the Accident and Incident Reporting System as described in JSP 375.

6 Records of the investigation are to be retained by the establishment for at least 50 years.

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