

**2001 No. 2975**

**HEALTH AND SAFETY**

**The Radiation (Emergency Preparedness and  
Public Information) Regulations 2001**

*Made* - - - - - 27th August 2001

*Laid before Parliament* 29th August 2001

*Coming into force* - - 20th September 2001

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The Secretary of State, in exercise of the powers (as respects regulations 1 to 16 and 18 to 22) conferred on him by sections 15(1), (2), (3)(a), (4)(b), (5)(a) and (b), 43(2) and 82(3)(a) of, and paragraphs 3(1), 6, 8(1), 11, 14, 15(1) and 16 of Schedule 3 to, the Health and Safety at Work etc. Act 1974(a) (“the 1974 Act”) and for the purpose of giving effect without modifications to proposals submitted to him by the Health and Safety Commission under section 11(2)(d) of the 1974 Act after the carrying out by the said Commission of consultations in accordance with section 50(3) of that Act, and (as respects regulations 17 and 21) under section 2(2) of the European Communities Act 1972(b) being the Minister designated(c) for the purposes of the said section 2(2) both in relation to measures relating to informing the public about health protection measures to be taken in the event of a radiological emergency and in relation to measures relating to the basic safety standards for the protection of the general public and workers against the dangers of ionising radiation, and of all other powers enabling him in that behalf, hereby makes the following Regulations:

#### **Citation and commencement**

1. These Regulations may be cited as the Radiation (Emergency Preparedness and Public Information) Regulations 2001 and shall come into force on 20th September 2001.

#### **Interpretation**

- 2.—(1) In these Regulations, unless the context otherwise requires—
  - “the 1996 Regulations” means the Packaging, Labelling and Carriage of Radioactive Material by Rail Regulations 1996(d);
  - “the 1999 Regulations” means the Ionising Radiations Regulations 1999(e);
  - “the Agency” in relation to premises or transport or a plan relating to premises or transport—
    - (a) in England and Wales, means the Environment Agency,
    - (b) in Scotland, means the Scottish Environment Protection Agency;
  - “approved dosimetry service” means an approved dosimetry service within the meaning of the 1999 Regulations and which is approved for the purpose of regulation 14 of these Regulations;
  - “carrier” shall be construed in accordance with paragraph (2);
  - “carrier’s emergency plan” shall be construed in accordance with regulation 8;
  - “consignor” means an employer carrying out work with ionising radiation who presents to a carrier for transport by rail a consignment of any radioactive substance;
  - “dose assessment” means the dose assessment made and recorded by an approved dosimetry service in accordance with regulation 21 of the 1999 Regulations;
  - “dose record” means the record made and maintained in respect of an employee by the approved dosimetry service in accordance with regulation 21 of the 1999 Regulations;

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(a) 1974 c.37; sections 15(1), 43 and 52 were amended by the Employment Protection Act 1975 (c.71), Schedule 15, paragraphs 6, 12 and 17 respectively; section 51A was added and section 52 was amended by the Police (Health and Safety) Act 1997 (c.42), sections 1 and 2 respectively.

(b) 1972 c.68.

(c) S.I. 1991/2289.

(d) S.I. 1996/2090, amended by S.I. 1999/303.

(e) S.I. 1999/3232.

“emergency exposure” means an exposure of an employee engaged in an activity of or associated with the response to a radiation emergency or potential radiation emergency in order to bring help to endangered persons, prevent exposure of a large number of persons or save a valuable installation or goods, whereby one of the individual dose limits referred to in paragraphs 1 or 2 of Part I of Schedule 4 to the 1999 Regulations could be exceeded;

“emergency services” means—

- (a) those police, fire and ambulance services who are likely to be required to respond to a radiation emergency which has occurred at the premises of an operator or at the location of a radiation emergency during the course of the transport of a radioactive substance, and
- (b) where appropriate, Her Majesty’s Coastguard;

“the Executive” means the Health and Safety Executive;

“health authority” means, in relation to England and Wales, a health authority established under section 8 of the National Health Service Act 1977<sup>(a)</sup> and, in relation to Scotland, a health board established under section 2 of the National Health Service (Scotland) Act 1978<sup>(b)</sup>;

“installation” means a unit in which the radioactive substances present are, or are intended to be, produced, used, handled or stored, and it includes—

- (a) equipment, structures, pipework, machinery and tools,
- (b) railway sidings, docks and unloading quays serving the unit, and
- (c) jetties, warehouses or similar structures, whether floating or not,

which are necessary for the operation of the unit;

“intervention” means a human activity that prevents or decreases the exposure of persons to radiation from a radiation emergency or from an event which could lead to a radiation emergency, by acting on the sources of radiation, the paths by which such radiation may be transmitted to persons and on persons themselves;

“ionising radiation” means the transfer of energy in the form of particles or electromagnetic waves of a wavelength of 100 nanometres or less or a frequency of  $3 \times 10^{15}$  hertz or more capable of producing ions directly or indirectly;

“licensed site” means a site in respect of which a nuclear site licence has been granted and is in force;

“licensee” means the person to whom a nuclear site licence has been granted;

“local authority” means—

- (a) subject to sub-paragraphs (b) and (c) below, in relation to—
  - (i) London, the London Fire and Emergency Planning Authority,
  - (ii) an area where there is a fire and civil defence authority, that authority,
  - (iii) the Isles of Scilly, the Council of the Isles of Scilly,
  - (iv) an area in the rest of England, the county council for that area or, where there is no county council for that area, the district council for that area,
  - (v) an area in Scotland, the council for the local government area, and
  - (vi) an area in Wales, the county council or the county borough council for that area;
- (b) for the purposes of regulation 16(2), in relation to—
  - (i) London, the London Fire and Emergency Planning Authority, and, in the City of London, the Common Council for the City of London, or, in an area in the rest of London, the London Borough Council for that area,
  - (ii) any other area where there is a fire and civil defence authority, that authority and the district council for that area,
  - (iii) the Isles of Scilly, the Council of the Isles of Scilly,
  - (iv) an area in the rest of England, the county council, if any, for that area and the district council, if any, for that area,
  - (v) an area in Scotland, the council for the local government area, and
  - (vi) an area in Wales, the county council or the county borough council for that area;
- (c) for the purposes of regulation 16(3), in relation to—

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(a) 1977 c.49; section 8 was substituted by the Health Authorities Act 1995 (c.17), section 1(1).

(b) 1978 c.29; section 2 was amended by the Health and Social Services and Social Security Adjustments Act 1983 (c.41), Schedule 7.

- (i) the City of London, the Common Council for the City of London,
- (ii) an area in the rest of London, the London Borough Council for that area,
- (iii) the Isles of Scilly, the Council of the Isle of Scilly,
- (iv) an area in the rest of England, the district council for that area or, where there is no district council for that area, the county council for that area,
- (v) an area in Scotland, the council for the local government area, and
- (vi) an area in Wales, the county council or the county borough council for that area;

“medical surveillance” means medical surveillance carried out in accordance with regulation 24 of the 1999 Regulations;

“member of the public” means any person not being—

- (a) a person for the time being present upon premises where a radiation emergency is reasonably foreseeable or where a radiation emergency has actually occurred, or
- (b) a person engaged in an activity of or associated with the response to a radiation emergency;

“non-dispersible source” means a sealed source or a radioactive substance which in either case by virtue of its physical and chemical form cannot cause a radiation emergency in any reasonably foreseeable event but it does not include any radioactive substance inside a nuclear reactor or any nuclear fuel element;

“nuclear site licence” has the meaning assigned to it by section 1(1) of the Nuclear Installations Act 1965(a);

“off-site emergency plan” shall be construed in accordance with regulation 9;

“operator” shall be construed in accordance with paragraph (3);

“operator’s emergency plan” shall be construed in accordance with regulation 7;

“premises” means—

- (a) the whole area under the control of the same person where radioactive substances are present in one or more installations, and for this purpose two or more areas under the control of the same person and separated only by a road, railway or inland waterway shall be treated as one whole area, or
- (b) where radioactive substances are present on a licensed site, that licensed site,

and, where a radioactive substance forms an integral part of a vessel and is used in connection with the operation of that vessel, it includes that vessel when it is at fixed point moorings or alongside berths, save that such vessel shall be deemed to be separate premises only where such moorings or berths do not form part of a licensed site or part of premises under the control of the Secretary of State for Defence;

“radiation accident” means an accident where immediate action would be required to prevent or reduce the exposure to ionising radiation of employees or any other persons and includes a radiation emergency;

“radiation emergency” means any event (other than a pre-existing situation) which is likely to result in any member of the public being exposed to ionising radiation arising from that event in excess of any of the doses set out in Schedule 1 and for this purpose any health protection measure to be taken during the 24 hours immediately following the event shall be disregarded;

“radioactive substance” means any substance which contains one or more radionuclides whose activity cannot be disregarded for the purposes of radiation protection;

“sealed source” means a source containing any radioactive substance whose structure is such as to prevent, under normal conditions of use, any dispersion of radioactive substances into the environment;

“transport” means—

- (a) carriage of a radioactive substance by rail in or on a vehicle and a radioactive substance shall be deemed as being transported from the time that it is loaded onto the vehicle for the purpose of transporting it until it is unloaded from that vehicle;
- (b) transferring or conveying a radioactive substance through any public place otherwise than—
  - (i) by rail, road, inland waterway, sea or air; or
  - (ii) by means of a pipeline or similar means;

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(a) 1965 c.57; section 1 was amended by S.I. 1974/2056 and S.I. 1990/1918.

“vehicle” means a railroad car or railway wagon, and for the purposes of these Regulations each car or wagon forming part of a larger vehicle shall be treated as a separate vehicle;

“work with ionising radiation” means work involving the production, processing, handling, use, holding, storage, transport by rail or disposal of radioactive substances which can increase the exposure of persons to radiation from an artificial source, or from a radioactive substance containing naturally occurring radionuclides which are processed for their radioactive, fissile or fertile properties.

- (2) In these Regulations, any reference to a carrier is a reference to—
- (a) an employer undertaking the transport by rail of any radioactive substance, and includes both a carrier for hire or reward and a carrier on own account, and
  - (b) an employer transferring or conveying a radioactive substance through any public place otherwise than by rail, road, inland waterway, sea or air or by means of a pipeline or similar means.
- (3) In these Regulations, any reference to an operator is a reference to—
- (a) in relation to any premises other than a licensed site, the person who is, in the course of a trade, business or other undertaking carried on by him, in control of the operation of premises, and
  - (b) in relation to a licensed site, the licensee,
- and any duty imposed by these Regulations on the operator shall extend only in relation to those premises.
- (4) In these Regulations, unless the context otherwise requires, any reference to—
- (a) an employer includes a reference to a self-employed person and any duty imposed by these Regulations on an employer in respect of his employee shall extend to a self-employed person in respect of himself;
  - (b) exposure to ionising radiation is a reference to exposure to ionising radiation arising from work with ionising radiation.
- (5) Any reference in these Regulations to—
- (a) a numbered regulation or Schedule is a reference to the regulation in or Schedule to these Regulations so numbered; and
  - (b) a numbered paragraph is a reference to the paragraph so numbered in the regulation or Schedule in which the reference appears.

### **Application**

3.—(1) Subject to paragraph (4) and regulation 17, these Regulations apply to any work with ionising radiation which involves—

- (a) having on any premises or providing facilities for there to be on any premises a radioactive substance containing more than the quantity of any radionuclide specified in Schedule 2 or, in the case of fissile material, more than the mass of that material specified in Schedule 3;
- (b) transporting by rail a radioactive substance containing more than the quantity of radionuclides specified in Schedule 4 or, in the case of fissile material, more than the mass of that material specified in Schedule 3; or
- (c) transferring or conveying a radioactive substance of a quantity or mass referred to in sub-paragraph (b) above through any public place otherwise than by rail, road, inland waterway, sea or air or by means of a pipeline or similar means.

(2) For the purposes of paragraph (1)(a), a quantity specified in Schedule 2 shall be treated as being exceeded if—

- (a) where only one radionuclide is involved, the quantity of that radionuclide exceeds the quantity specified in the appropriate entry in Part I of Schedule 2; or
- (b) where more than one radionuclide is involved, the quantity ratio calculated in accordance with Part II of Schedule 2 exceeds one.

(3) For the purposes of paragraph (1)(b), a quantity specified in Schedule 4 shall be treated as being exceeded if—

- (a) where only one radionuclide is involved, the quantity of that radionuclide exceeds the quantity specified in the appropriate entry in Part I of Schedule 4; or

- (b) where more than one radionuclide is involved, the quantity ratio calculated in accordance with Part II of Schedule 4 exceeds one.
- (4) These Regulations shall not apply in respect of—
- (a) except for the transport of such source, any non-dispersible source;
  - (b) except for the transport of such substance, any radioactive substance which has an activity concentration of not more than 100Bqg<sup>-1</sup>;
  - (c) any radioactive substance conforming to the specifications for special form radioactive material set out in the 1996 Regulations and which is certified pursuant to those Regulations as complying with them or where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1996 Regulations;
  - (d) any radioactive substance which is in a package which complies in every respect with either the requirements for—
    - (i) a Type B package design within the meaning of the 1996 Regulations; or
    - (ii) a consignment shipped under Special Arrangement Transport Operations for the equivalent of a Type B package within the meaning of the 1996 Regulations, and which is, in either case, certified pursuant to those Regulations as complying with them or where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1996 Regulations;
  - (e) the transport of any radioactive substance in the form of a low specific activity material conforming to the specifications for LSA-I, LSA-II or LSA-III within the meaning of the 1996 Regulations including cases where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1996 Regulations;
  - (f) the transport of any radioactive substance in the form of a surface contaminated object conforming to the specifications for SCO-I or SCO-II within the meaning of the 1996 Regulations including cases where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1996 Regulations;
  - (g) the presence of a radioactive substance while it is in or on the live body or corpse of a human being or animal where that presence occurs otherwise than in consequence of a radiation emergency.
- (5) These Regulations shall not apply in Northern Ireland.

#### **Hazard identification and risk evaluation**

- 4.—(1) In relation to work with ionising radiation to which these Regulations apply—
- (a) every operator shall, before such work is for the first time carried out at the premises, make an assessment; and
  - (b) every carrier shall before he for the first time undertakes the transport of any radioactive substance make or ensure that there has been made an assessment,
- which, in either case, is sufficient to demonstrate that—
- (c) all hazards arising from that work with the potential to cause a radiation accident have been identified; and
  - (d) the nature and magnitude of the risks to employees and other persons arising from those hazards have been evaluated.
- (2) Where the assessment made for the purposes of paragraph (1) or of regulation 5 shows that a radiation risk to employees or other persons exists from an identifiable radiation accident, the operator or carrier, as the case may be, shall take all reasonably practicable steps to—
- (a) prevent any such accident; and
  - (b) limit the consequences of any such accident which does occur.
- (3) The requirements of this regulation are without prejudice to the requirements of regulation 3 (Risk assessment) of the Management of Health and Safety at Work Regulations 1999(a) and to regulation 7 (Prior risk assessment etc.) of the 1999 Regulations.

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(a) S.I. 1999/3242.

## **Review of hazard identification and risk evaluation**

5.—(1) Where a material change occurs in the work with ionising radiation to which an assessment made pursuant to regulation 4(1) relates—

- (a) the operator shall make a further assessment to take account of that change; and
- (b) the carrier shall make or ensure that there has been made a further assessment to take account of that change.

(2) For such time as the work with ionising radiation in respect of which an assessment made pursuant to regulation 4(1) continues, the operator and carrier shall, within 3 years of the date of the last assessment (whether made in accordance with regulation 4(1), paragraph (1) or this paragraph) either—

- (a) make (or, in relation to a carrier, ensure that there has been made) a further assessment; or
- (b) if there is no change of circumstances which would affect the last report of the assessment required by regulation 6, sign a declaration to that effect.

## **Reports of assessment**

6.—(1) Where an assessment has been made pursuant to regulation 4(1) by an operator or carrier—

- (a) the operator in question shall send to the Executive a report of that assessment at least twelve months before the commencement of the work with ionising radiation to which the assessment relates or within such shorter time in advance as the Executive may agree; and
- (b) the carrier in question shall send to the Executive a report of that assessment at least 28 days before the commencement of the work with ionising radiation to which the assessment relates or within such shorter time in advance as the Executive may agree.

(2) Where an assessment has been made pursuant to regulation 5(1), the operator or carrier in question shall send to the Executive a report of that assessment within 28 days of the making of the material change or such longer time as the Executive may agree.

(3) Where an assessment or declaration has been made pursuant to regulation 5(2), the operator or carrier in question shall send to the Executive a report of that assessment or the declaration, as the case may be, within 28 days of the assessment or declaration being made.

(4) A report of an assessment made for the purposes of this regulation shall include the particulars specified in Schedule 5.

(5) Where, for the purpose of assessing the risk to health or safety of persons who could be affected by work with ionising radiation to which regulation 4 applies, the Executive may reasonably require a detailed assessment of any of the further particulars set out in Schedule 6, it may, by notice in writing served on the operator or carrier, require him to carry out (or, in relation to a carrier, require him to ensure that there has been carried out) such detailed assessment of such matters as are specified in the notice and the operator or carrier, as the case may be, shall send a report of that assessment to the Executive within such time as is specified in the notice or within such longer time as the Executive may subsequently allow.

## **Operator's emergency plan**

7.—(1) Where the assessment made by an operator in accordance with regulation 4(1) or regulation 5 shows that it is reasonably foreseeable that a radiation emergency might arise (having regard to the steps taken by the operator under regulation 4(2)), the operator shall prepare an adequate emergency plan (in these Regulations referred to as an “operator's emergency plan”) designed to secure, so far as is reasonably practicable, the restriction of exposure to ionising radiation and the health and safety of persons who may be affected by such reasonably foreseeable emergencies as are identified by the said assessment.

(2) Without prejudice to paragraph (1), the operator's emergency plan shall contain the information specified in Part I of Schedule 7.

(3) No person shall carry out work with ionising radiation to which the assessment made in accordance with regulation 4(1) applies unless—

- (a) the operator has complied with the requirements of paragraphs (1) and (2); and

(b) the local authority has complied with the requirements of regulation 9(1), (2), (8) and (9) and has provided confirmation of this to the operator in accordance with regulation 9(13).

(4) The operator's emergency plan shall be drawn up having regard to the principles set out in Part I of Schedule 8.

(5) Without prejudice to the generality of paragraph (1), the operator's emergency plan shall secure, where appropriate, intervention for the purposes set out in Part II of Schedule 8.

(6) For the purpose of preparing the operator's emergency plan pursuant to paragraph (1) or of reviewing the plan pursuant to regulation 10(1), the operator shall consult—

(a) his employees, any person carrying out work on behalf of the operator, the Executive, the local authority in whose area the premises of the operator are situated, the emergency services, the health authority for the area in which the premises of the operator are situated and the Agency; and

(b) such other persons, bodies and authorities as the operator considers appropriate, and, in a case where the emergency services form part of the plan, shall give such information to those services as will enable them to perform their functions in accordance with the plan.

(7) The operator shall ensure that any employee who may be involved with or may be affected by arrangements in the operator's emergency plan is or has been provided with—

(a) suitable and sufficient information, instruction and training; and

(b) the equipment necessary to restrict that employee's exposure to ionising radiation including, where appropriate, the issue of suitable dosimeters or other devices obtained in either case from the approved dosimetry service with which the operator has entered into an arrangement under regulation 21 of the 1999 Regulations.

(8) The operator shall provide to the Executive upon request and within such reasonable time as the Executive may specify a copy of the operator's emergency plan or such parts of that plan as the Executive may require.

### **Carrier's emergency plan**

8.—(1) Where the assessment made in accordance with regulation 4(1) or regulation 5 shows that it is reasonably foreseeable that a radiation emergency might arise in respect of the transport of a radioactive substance (having regard to the steps taken by the carrier under regulation 4(2)), the carrier shall prepare or ensure that there has been prepared an adequate emergency plan in respect of the transport of such substances (in these Regulations referred to as a "carrier's emergency plan") designed to secure, so far as is reasonably practicable, the restriction of exposure to ionising radiation and the health and safety of persons who may be affected by such reasonably foreseeable emergencies as are identified by the said assessment.

(2) Without prejudice to paragraph (1), the carrier's emergency plan shall contain the information specified in Part II of Schedule 7.

(3) A carrier shall not undertake the transport of any radioactive substance to which the assessment made in accordance with regulation 4(1) applies unless he has complied with the requirements of paragraph (1) and (2).

(4) Where not also the carrier, the consignor shall, before presenting a consignment of any radioactive substance for transport, supply to the carrier such information as is necessary for the purpose of enabling the carrier to prepare or ensure that there is prepared the carrier's emergency plan required by this regulation.

(5) The carrier's emergency plan shall be drawn up having regard to the principles set out in Part I of Schedule 8.

(6) Without prejudice to the generality of paragraph (1), the carrier's emergency plan shall secure, where appropriate, intervention for the purposes set out in Part II of Schedule 8.

(7) For the purpose of preparing a carrier's emergency plan pursuant to paragraph (1) or of reviewing the plan pursuant to regulation 10(1), the carrier shall ensure that consultation is carried out with—

(a) the Executive, (where not also the carrier) the consignor and the Agency; and



- (b) such local authorities, emergency services, health authorities and other persons, bodies or authorities (or in each case representatives thereof) as the carrier considers appropriate.

(8) The carrier shall ensure that any employee under his control who may be involved with or may be affected by arrangements in the carrier's emergency plan is or has been provided with—

- (a) suitable and sufficient information, instruction and training; and
- (b) the equipment necessary to restrict that employee's exposure to ionising radiation including, where appropriate, suitable dosimeters or other devices obtained in either case from the approved dosimetry service with which the carrier has entered into an arrangement under regulation 21 of the 1999 Regulations.

(9) Where requested by the Executive, the carrier shall provide to the Executive within such reasonable time as may be specified a copy of the carrier's emergency plan or such parts of the plan as the Executive may require.

### **Off-site emergency plan**

9.—(1) The local authority in whose area there is situated premises at which there is carried out work with ionising radiation to which these Regulations apply and in respect of which an assessment made by the operator pursuant to regulation 4(1) or regulation 5 shows that it is reasonably foreseeable that a radiation emergency might arise (having regard to the steps taken by the operator under regulation 4(2)) shall prepare an adequate emergency plan (in these Regulations referred to as an "off-site emergency plan") designed to secure, so far as is reasonably practicable, the restriction of exposure to ionising radiation and the health and safety of persons who may be affected by such reasonably foreseeable emergencies as are identified in that assessment and the plan shall be prepared in respect of such area as in the opinion of the Executive any member of the public is likely to be affected by such radiation emergencies.

(2) Without prejudice to paragraph (1), the off-site emergency plan shall contain the information specified in Part III of Schedule 7.

(3) The off-site emergency plan prepared pursuant to paragraph (1) shall address each reasonably foreseeable radiation emergency that has been identified by the operator for the purposes of regulation 7(1).

(4) Where an assessment has been made pursuant to regulation 4(1), within 28 days of sending the report of the assessment to the Executive in accordance with regulation 6(1), the operator shall supply to the local authority such information as is necessary for the purpose of enabling the authority to prepare the off-site emergency plan required by paragraph (1).

(5) Without prejudice to paragraph (4), the operator shall further supply to the local authority—

- (a) any additional information the local authority may reasonably request to enable the off-site emergency plan to be prepared; and
- (b) details of any material change to the information provided under paragraph (4) resulting from—
  - (i) a further assessment made pursuant to regulation 5(1) or (2); or
  - (ii) a revision of the operator's emergency plan pursuant to regulation 10(1).

(6) The information provided to a local authority pursuant to paragraphs (4) or (5)(a) shall be reviewed and where necessary revised by the operator at suitable intervals not exceeding 3 years from the date at which information was last supplied to the local authority under those paragraphs and the operator shall within 28 days inform the local authority of the outcome of that review.

(7) The operator shall, within 28 days of any further assessment or revision referred to in paragraph (5)(b) inform the local authority of any material change to the information supplied arising from that assessment or review.

(8) Subject to paragraph (9), the off-site emergency plan shall be prepared no later than 6 months (or such longer period as the Executive may agree in writing) after whichever is the later of—

- (a) the receipt by the local authority of a notice from the Executive informing the local authority of the need to prepare an off-site emergency plan in respect of the area; or

(b) the receipt by the local authority of the information referred to in paragraph (4).

(9) The off-site emergency plan shall be prepared before the operator carries out work with ionising radiation to which the assessment made in accordance with regulation 4(1) applies.

(10) The off-site emergency plan shall be drawn up having regard to the principles set out in Part I of Schedule 8.

(11) Without prejudice to the generality of paragraph (1), the off-site emergency plan shall secure, where appropriate, intervention for the purposes set out in Part II of Schedule 8.

(12) For the purpose of preparing an off-site emergency plan pursuant to paragraph (1) or of reviewing the plan pursuant to regulation 10(1), the local authority shall consult—

(a) the operator carrying out the work with ionising radiation to which the plan relates, the Executive, the emergency services, each health authority in the vicinity of the premises of the operator and the Agency; and

(b) such other persons, bodies and authorities and members of the public as the local authority considers appropriate.

(13) Once it has prepared the off-site emergency plan the local authority shall confirm in writing to the operator that it has done so.

(14) The employer of any employee who may be required to participate in the implementation of an off-site emergency plan shall ensure that such employees of his are or have been provided with—

(a) suitable and sufficient information, instruction and training; and

(b) the equipment necessary to restrict that employee's exposure to ionising radiation including, where appropriate, the issue of suitable dosimeters or other devices.

(15) The local authority shall provide to the Executive upon request and within such reasonable time as may be specified a copy of the off-site emergency plan or such parts of that plan as the Executive may require.

### **Review and testing of emergency plans**

**10.**—(1) The operator, carrier or local authority who has prepared (or, in relation to a carrier, has ensured that there has been prepared) an emergency plan pursuant to regulation 7, 8 or 9, as the case may be, shall at suitable intervals not exceeding 3 years—

(a) review and where necessary revise the plan; and

(b) test the plan and take reasonable steps to arrange for the emergency services to participate in the test to such extent as is necessary,

and any such review shall take into account changes occurring in the work with ionising radiation to which the plan relates and within the emergency services concerned, new technical knowledge and knowledge concerning the response to radiation emergencies and any material change to the assessment on which the plan was based since it was last reviewed or revised.

(2) The local authority shall endeavour to reach agreement with the operator who is subject to a duty to prepare an operator's emergency plan and the emergency services as to how the off-site emergency plan is to be tested.

(3) The carrier shall endeavour to reach agreement with such local authorities and emergency services as are appropriate as to how the carrier's emergency plan is to be tested.

### **Consultation and co-operation**

**11.**—(1) In performing the duties imposed on him by regulations 4(1)(a), 4(2), 5 and 7, the operator shall consult any other employer who carries out work with ionising radiation on the premises and shall for the purpose of compliance with those duties take into account relevant matters arising from that consultation.

(2) Any employer who carries out work with ionising radiation at premises to which these Regulations apply shall co-operate with the operator by providing information or otherwise to the extent necessary to ensure that the operator is enabled to comply with the requirements of these Regulations (including the testing of emergency plans) in so far as his ability depends on such co-operation.

(3) Any person who is subject to a duty under these Regulations to prepare an emergency plan and any employer of any other person whose participation is reasonably required by any such plan shall co-operate with each other by the exchange of information or otherwise to the extent necessary to ensure that each person is enabled to comply with the requirements of these Regulations (including the testing of emergency plans) in so far as his ability to comply depends upon such co-operation.

#### **Charge for preparation, review and testing of emergency plans**

**12.—**(1) A local authority may charge—

- (a) the operator a fee for performing the local authority's functions in relation to the off-site emergency plan under regulations 9 and 10; and
- (b) the carrier a fee for performing the local authority's functions in relation to the carrier's emergency plan under regulation 10(1)(b).

(2) The fee charged under paragraph (1) shall not exceed the sum of costs reasonably incurred by the local authority in performing the functions referred to in that paragraph, including (but without prejudice to the generality of the foregoing provision of this paragraph) any costs reasonably incurred by the local authority in arranging for the emergency services to participate in the testing of the off-site emergency plan or the carrier's plan, as the case may be.

(3) When requiring payment the local authority shall send or give to the operator or carrier, as the case may be, a detailed statement of the work done and the costs incurred including the dates of any site visits and the period to which the statement relates and the fee, which shall be recoverable only as a civil debt, shall become payable one month after the statement has been sent or given.

#### **Implementation of emergency plans**

**13.—**(1) An operator or carrier who has prepared (or, in relation to a carrier, has ensured that there has been prepared) an emergency plan pursuant to regulation 7 or 8, as the case may be, shall take reasonable steps to put it, or such parts of it as are necessary, into effect without delay when—

- (a) a radiation emergency occurs, or
  - (b) an event occurs which could reasonably be expected to lead to a radiation emergency,
- and shall notify such occurrence to the Executive without delay.

(2) A local authority which has prepared an emergency plan pursuant to regulation 9 shall take reasonable steps to ensure that it, or such parts of it as are necessary, is put into effect without delay when informed by the operator that—

- (a) a radiation emergency has occurred; or
- (b) an event has occurred which could reasonably be expected to lead to a radiation emergency.

(3) In the event of a radiation emergency resulting from his work with ionising radiation, the operator or carrier shall—

- (a) as soon as is reasonably practicable, make (or, in relation to a carrier, ensure that there has been made) a provisional assessment of the circumstances and consequences of such an emergency and for this purpose shall consult—
  - (i) in the case of the operator, the emergency services, the local authority, the health authority, the Agency and such other persons, bodies or authorities as have functions under the operator's emergency plan or the off-site emergency plan; and
  - (ii) in the case of the carrier, the consignor, the Agency and any emergency services, local authority and health authority who were involved in the response to the emergency and such other persons, bodies or authorities as have functions under the carrier's emergency plan;
- (b) as soon as is practicable and in any event within 12 months or such longer time as the Executive may agree, make (or in relation to a carrier ensure that there has been made) a full assessment of the consequences of that emergency and the effectiveness of the emergency plans put into effect as a result of that emergency; and

- (c) within 28 days of the completion of the assessment under sub-paragraph (b) make a report of the findings of the assessment and retain that report or a copy thereof for at least 50 years from the date upon which the report was completed.
- (4) The operator or carrier shall provide to the Executive within 28 days of the making of the report under paragraph (3)(c) above a copy of that report.

### **Emergency exposures**

**14.**—(1) Where an emergency plan prepared pursuant to these Regulations provides for the possibility of any employee receiving an emergency exposure, each employer shall in relation to his employees—

- (a) identify those employees who may be subject to emergency exposures;
- (b) provide such employees with appropriate training in the field of radiation protection and such information and instruction as is suitable and sufficient for them to know the risks to health created by exposure to ionising radiation and the precautions which should be taken;
- (c) provide such equipment as is necessary to restrict the exposure of such employees to radiation;
- (d) make arrangements for medical surveillance by an appointed doctor or employment medical adviser to be carried out without delay in the event of a radiation emergency in respect of those employees who receive emergency exposures;
- (e) make arrangements with an approved dosimetry service for—
  - (i) dose assessments to be carried out without delay in the event of a radiation emergency in respect of those employees who receive emergency exposures, and a dose assessment made for the purpose of this sub-paragraph shall, where practicable, be made separately from any other dose assessment relating to those employees; and
  - (ii) the results of the dose assessments carried out under sub-paragraph (i) above to be notified without delay to the employer and to the Executive;
- (f) make arrangements, in respect of dose assessments to be carried out and notified pursuant to sub-paragraph (e) above, to notify the results of such assessments without delay to the appointed doctor or employment medical adviser who is carrying out the medical surveillance on the employee to whom the assessment relates;
- (g) identify those employees who shall be authorised, in the event of a radiation emergency, to permit any employee referred to in sub-paragraph (a) above to be subject to an emergency exposure and provide employees who are so authorised with appropriate training.

(2) An operator shall, at least 28 days before he for the first time commences work with ionising radiation, and a carrier shall at least 28 days before he for the first time undertakes transport of any radioactive substance, or in either case within such shorter time in advance as the Executive may agree, notify to the Executive the dose levels which he has determined are appropriate to be applied in respect of an employee identified for the purposes of paragraph (1)(a) in the event of such emergency.

(3) Where an operator or carrier determines that a dose level notified under paragraph (2) above is no longer appropriate to be applied in respect of an employee identified for the purposes of paragraph (1)(a) in the event of such emergency, and that a revised level should be determined, the operator or carrier, as the case may be, shall, at least 28 days before formally determining the revised dose level, or within such shorter time in advance as the Executive may agree, notify to the Executive the revised dose level which he considers is appropriate to be applied.

(4) In any case where in the opinion of the Executive the dose levels for emergency exposure notified pursuant to paragraph (2) or (3) are too high, the operator or carrier shall, if so directed by the Executive, substitute such other dose level or levels as the Executive may consider is appropriate.

(5) Where an emergency plan is put into effect pursuant to the provisions of regulation 13, each employer shall ensure—

- (a) that no employee of his under 18 years of age, no trainee under 18 years of age and no female employee who is pregnant or breastfeeding is subject to an emergency exposure;

- (b) that no other employee of his is subject to an emergency exposure unless—
  - (i) that employee has agreed to undergo such exposure;
  - (ii) the requirements of paragraph (1)(a) to (f) have been complied with in respect of that employee; and
  - (iii) that employee has been permitted to be so by an employee authorised for that purpose under paragraph (1)(g); and
- (c) that no employee of his involved in implementing an emergency plan is exposed to a dose of radiation in excess of the dose level determined in accordance with paragraphs (2), (3) or (4).

(6) The requirement imposed on the employer by paragraph (5)(a) shall not apply in respect of a female employee who is pregnant or breastfeeding until such time as the employee has notified the employer in writing of that fact or the employer should reasonably have been aware of that fact.

(7) The requirement imposed by paragraph (5)(c) shall not apply in respect of an exposure of any employee who—

- (a) being informed about the risks involved in the intervention, agrees to undergo an exposure greater than any dose level referred to in that sub-paragraph for the purpose of saving human life; and
- (b) is permitted to undergo such exposure by an employee authorised by the employer in accordance with paragraph (1)(g) to give such permission.

(8) Where an employee has undergone an emergency exposure, the employer shall ensure that the dose of ionising radiation received by that employee is assessed by an approved dosimetry service and that the dose assessed is recorded separately in the dose record of that employee or, where no dose record exists, in a record created for the purpose of this paragraph complying with the requirements to which it would be subject if it were a dose record.

(9) An employer shall at the request of an employee of his in respect of whom a record has been created for the purposes of paragraph (8), and on reasonable notice being given, obtain from the approved dosimetry service and make available to the employee a copy of the record of dose relating to that employee.

(10) In the event of a report made pursuant to regulation 13(3) relating to the circumstances of an emergency exposure and the action taken as a result of that exposure, an employer shall keep such report (or a copy thereof) until the person to whom the report relates has or would have attained the age of 75 years but in any event for at least 50 years from the termination of the work which involved any emergency exposure.

### **Disapplication of dose limits**

**15.** In the event of a radiation emergency, regulation 11 of the 1999 Regulations shall not apply to intervention.

### **Prior information to the public**

**16.—(1)** An operator or carrier who carries out work with ionising radiation from which a radiation emergency is reasonably foreseeable shall—

- (a) ensure that members of the public who are in an area in which, in the opinion of the Executive, they are likely to be affected by a radiation emergency arising from the undertaking of that operator or carrier, as the case may be, are supplied, in an appropriate manner, without their having to request it, with at least the information specified in Schedule 9; and
- (b) make that information publicly available.

(2) In preparing the information to be supplied in accordance with paragraph (1), the operator or carrier shall consult each local authority in the area or areas referred to in that paragraph, any authority likely to fall within paragraph 5 of Schedule 9 and such other persons who seem to him to be appropriate, but the operator or carrier, as the case may be, shall remain responsible for the accuracy, completeness and form of the information so supplied.

(3) Without prejudice to his duty under paragraph (1), the operator or carrier shall endeavour to enter into an agreement with the local authority in the area referred to in that paragraph for that authority to disseminate the information required to be supplied in accordance with that paragraph to the members of the public mentioned in it.

(4) The operator or carrier shall review and where necessary revise the information referred to in paragraph (1)—

- (a) at regular intervals but, in any case, not less than once in three years; and
- (b) whenever significant changes to the emergency measures, action and authorities referred to in paragraphs 3, 4 and 5 of Schedule 9 take place.

(5) The operator or carrier shall ensure that the information referred to in paragraph (1) is supplied in accordance with that paragraph before carrying out work with ionising radiation to which the assessment made in accordance with regulation 4(1) (a) or (b), as the case may be, applies and that the information is so supplied again and made publicly available—

- (a) at intervals not exceeding three years; and
- (b) if it is revised pursuant to paragraph (4), as soon as is reasonably practicable after the revision.

(6) Where a report made pursuant to regulation 6 relates to an assessment which identifies any reasonably foreseeable radiation emergency, the operator or carrier, as the case may be, shall make such report available to the public as soon as is reasonably practicable after it has been sent to the Executive under that regulation (except that, with the approval of the Executive, the operator or carrier need not make available any parts of such reports for reasons of industrial, commercial or personal confidentiality, public security or national defence).

#### **Duty of local authority to supply information to the public in the event of a radiation emergency**

**17.**—(1) Every local authority shall prepare and keep up to date arrangements to supply, in the event of any radiation emergency in that local authority's area (howsoever that emergency may arise), information of and advice on the facts of the emergency, of the steps to be taken and, as appropriate, of health protection measures applicable.

(2) The arrangements prepared and kept up to date under paragraph (1) shall provide for the information to be supplied at regular intervals in an appropriate manner, without delay, and without their having to request it, to members of the public who are in that local authority's area and who are actually affected by the radiation emergency.

(3) In preparing those arrangements and keeping them up to date, the local authority shall consult any authority likely to be responsible for implementing the relevant measures referred to in Schedule 10 and such other persons as appear to it to be appropriate.

(4) The information and advice to be supplied in accordance with arrangements prepared and kept up to date under paragraph (1) shall, if relevant to the type of radiation emergency, include that specified in Schedule 10 and shall, in any event, mention the authority or authorities responsible for implementing the relevant measures referred to in that Schedule.

(5) For the purposes of paragraph (2), the members of the public referred to in that paragraph as actually affected are those whose co-operation is sought to put into effect any steps or health protection measures referred to in paragraph (1).

#### **Modifications relating to the Ministry of Defence etc.**

**18.**—(1) In this regulation, any reference to—

- (a) “visiting forces” is a reference to visiting forces within the meaning of any provision of Part 1 of the Visiting Forces Act 1952(a); and
- (b) “headquarters or organisation” is a reference to a headquarters or organisation designated for the purposes of the International Headquarters and Defence Organisations Act 1964(b).

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(a) 1952 c.67.

(b) 1964 c.5.

(2) The Secretary of State for Defence may, in the interests of national security, by a certificate in writing exempt—

- (a) Her Majesty's Forces;
- (b) visiting forces;
- (c) any member of a visiting force working in or attached to any headquarters or organisation; or
- (d) any person engaged in work with ionising radiation for, or on behalf of, the Secretary of State for Defence,

from all or any of the requirements or prohibitions imposed by these Regulations and any such exemption may be granted subject to conditions and to a limit of time and may be revoked at any time by a certificate in writing.

(3) The requirements of regulation 14 shall not have effect to the extent that this regulation would in the opinion of the Secretary of State for Defence be against the interests of national security.

### **Enforcement and offences**

**19.** Insofar as any provision of regulations 17 and 21 is made under section 2(2) of the European Communities Act 1972, sections—

- (a) 16 to 21 (approval of codes of practice and enforcement);
- (b) 23 (provisions supplementary to sections 21 and 22) and 24 (appeal against improvement or prohibition notice), so far as they relate to an improvement notice;
- (c) 26 (power to indemnify inspectors); and
- (d) 33 to 42 (provisions as to offences),

of the Health and Safety at Work etc. Act 1974 shall apply to that provision as if that provision had been made under section 15 of that Act.

### **Transitional provisions**

**20.—(1)** Where an operator or carrier has carried out work with ionising radiation before the date of the coming into force of these Regulations, an assessment made pursuant to any enactment for the purposes of identifying those matters referred to in sub-paragraphs (c) and (d) of regulation 4(1) shall be deemed to have been made pursuant to regulation 4.

(2) Where work with ionising radiation to which these Regulations apply has commenced before the date of the coming into force of these Regulations—

- (a) an operator or carrier who is required to send a report of assessment to the Executive under regulation 6(1) shall be deemed to have complied with the requirements of that paragraph if such report is sent to the Executive within 5 months of that date or within such longer time as the Executive may agree;
- (b) an operator who is required to prepare an operator's emergency plan under regulation 7(1) and a carrier who is required to prepare a carrier's emergency plan under regulation 8(1) shall be deemed to have complied with the requirements of that paragraph if that plan is prepared within 6 months of that date or within such longer time as the Executive may agree, and in such case paragraph (3) of regulation 7 or 8 respectively and regulation 9(9) shall not apply;
- (c) an operator who is required to provide information to the local authority in accordance with the requirements of paragraph (4) of regulation 9 shall be deemed to have complied with that paragraph if he provides the required information to the local authority within 6 months of that date or within such longer time as the Executive may agree;
- (d) an operator or carrier who is required to notify the Executive of the determined dose levels under regulation 14(2) shall be deemed to have complied with the requirements of that regulation if such notification is given to the Executive within 5 months of that date or within such longer time as the Executive may agree; and
- (e) subject to paragraph (3) below, an operator or carrier who is required to supply information to the public pursuant to paragraph (1) of regulation 16 shall be deemed to have complied with that paragraph if the information specified in Schedule 9 is supplied within a reasonable time after preparation of the off-site emergency plan or the carrier's emergency plan, as the case may be.

(3) Where prior to the coming into force of these Regulations an operator or carrier has supplied information to the public pursuant to regulation 3 of the Public Information for Radiation Emergencies Regulations 1992(a), the supply of that information, to the extent that it relates to matters to which these Regulations apply, shall for a period of 3 years from the date upon which it was supplied or, where that information has been updated, the date upon which it was last updated, be deemed to comply with the requirements of regulation 16(1) of these Regulations and for the purposes of these Regulations that information shall be treated as if it had been supplied pursuant to regulation 16(1).

#### **Amendment of Regulations**

**21.** The Regulations referred to in Schedule 11 shall be amended in accordance with the provisions of that Schedule.

#### **Revocation and saving**

**22.—**(1) The Public Information for Radiation Emergencies Regulations 1992 are revoked, save that—

- (a) to the extent that it applies in relation to the transport of radioactive substances by road, inland waterway, sea or air, regulation 3 (Employer or self-employed person to supply prior information) shall continue in force; and
- (b) any other provisions of the said 1992 Regulations in so far as is necessary to give effect to regulation 3 shall also continue in force.

(2) Paragraph (3) of regulation 41 of the 1999 Regulations is revoked.

(3) To the extent that it applies in relation to the transport of radioactive substances by road, inland waterway, sea or air, regulation 26 (Special hazard assessment) of the Ionising Radiations Regulations 1985(b) (in this paragraph referred to as “the 1985 Regulations”) shall continue in force and, in respect of any employer subject to the said regulation 26, the following provisions shall also continue in force—

- (a) paragraphs (1) to (3), (4)(b) and (c) and (5) of regulation 27 (Contingency plans) with the modification that—
  - (i) in paragraph (1), the reference to regulation 25(1) of the 1985 Regulations shall be treated as a reference to regulation 7(1) or (2) of the 1999 Regulations;
  - (ii) in paragraph (1)(b), the reference to regulation 8(1) of and Schedule 6 to the 1985 Regulations shall be treated as a reference to regulation 16 of the 1999 Regulations;
  - (iii) in paragraph (4)(b), the reference to regulation 13(2) of the 1985 Regulations shall be treated as a reference to regulation 21(2) of the 1999 Regulations;
- (b) any other provisions of the 1985 Regulations in so far as is necessary to give effect to the provisions specified in this paragraph.

Signed by order of the Secretary of State

27th August 2001.

*Brian Wilson,*  
Minister of State for Industry and Energy,  
Department of Trade and Industry.

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(a) S.I. 1992/2997.

(b) S.I.1985/1333, revoked (subject to a saving) by regulation 41 of the Ionising Radiations Regulations 1999.



**DOSES OF IONISING RADIATION WITHIN  
THE MEANING OF “RADIATION EMERGENCY”**

1. An effective dose of 5 mSv in the period of one year immediately following the radiation emergency.
2. Without prejudice to paragraph 1—
  - (a) an equivalent dose for the lens of the eye of 15 mSv in the period of one year immediately following the radiation emergency; and
  - (b) an equivalent dose for the skin of 50 mSv in the period of one year immediately following the radiation emergency over 1cm<sup>2</sup> area of skin, regardless of the area exposed.
3. In this Schedule—
  - (a) any reference to an effective dose means the sum of the effective dose to the whole body from external radiation and the committed effective dose from internal radiation;
  - (b) any reference to equivalent dose to a human tissue or organ includes the committed equivalent dose to that tissue or organ from internal radiation;
  - (c) “external radiation” means, in relation to a person, ionising radiation coming from outside the body of that person; and
  - (d) “internal radiation” means, in relation to a person, ionising radiation coming from inside the body of that person.



Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Astatine At-207 At-211		4 10 <sup>12</sup> 2 10 <sup>11</sup>
Barium Ba-126 Ba-128 Ba-131 Ba-131m Ba-133 Ba-133m Ba-135m Ba-139 Ba-140 Ba-141 Ba-142		2 10 <sup>13</sup> 1 10 <sup>13</sup> 6 10 <sup>12</sup> 3 10 <sup>12</sup> 4 10 <sup>11</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 11, <sup>012</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup>
Berkelium Bk-245 Bk-246 Bk-247 Bk-249 Bk-250		3 10 <sup>12</sup> 6 10 <sup>12</sup> 3 10 <sup>8</sup> 2 10 <sup>11</sup> 2 10 <sup>12</sup>
Beryllium Be-7 Be-10		2 10 <sup>13</sup> 6 10 <sup>11</sup>
Bismuth Bi-200 Bi-201 Bi-202 Bi-203 Bi-205 Bi-206 Bi-207 Bi-210 Bi-210m Bi-212 Bi-213 Bi-214		2 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>11</sup> 2 10 <sup>11</sup> 6 10 <sup>9</sup> 7 10 <sup>11</sup> 7 10 <sup>11</sup> 1 10 <sup>12</sup>
Bromine Br-74 Br-74m Br-75 Br-76 Br-77 Br-80 Br-80m Br-82 Br-83 Br-84		8 10 <sup>11</sup> 6 10 <sup>11</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 4 10 <sup>13</sup> 1 10 <sup>12</sup> 5 10 <sup>12</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 7 10 <sup>11</sup>
Cadmium Cd-104 Cd-107 Cd-109 Cd-113 Cd-113m Cd-115 Cd-115m Cd-117 Cd-117m		1 10 <sup>13</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>11</sup> 1 10 <sup>11</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Caesium Cs-125 Cs-127 Cs-129 Cs-130 Cs-131 Cs-132 Cs-134 Cs-134m Cs-135 Cs-135m Cs-136 Cs-137 Cs-138		2 10 <sup>12</sup> 1 10 <sup>13</sup> 2 10 <sup>13</sup> 2 10 <sup>12</sup> 6 10 <sup>13</sup> 9 10 <sup>12</sup> 7 10 <sup>10</sup> 4 10 <sup>12</sup> 9 10 <sup>11</sup> 8 10 <sup>12</sup> 8 10 <sup>11</sup> 1 10 <sup>11</sup> 8 10 <sup>11</sup>
Calcium Ca-41 Ca-45 Ca-47		3 10 <sup>13</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup>
Californium Cf-244 Cf-246 Cf-248 Cf-249 Cf-250 Cf-251 Cf-252 Cf-253 Cf-254		2 10 <sup>12</sup> 5 10 <sup>10</sup> 2 10 <sup>9</sup> 3 10 <sup>8</sup> 7 10 <sup>8</sup> 3 10 <sup>8</sup> 1 10 <sup>9</sup> 2 10 <sup>10</sup> 4 10 <sup>8</sup>
Carbon C-11 C-11 C-11 C-11 C-14 C-14 C-14 C-14	  (vapour) (dioxide gas) (monoxide gas)   (vapour) (dioxide gas) (monoxide gas)	2 10 <sup>12</sup> 1 10 <sup>14</sup> 1 10 <sup>14</sup> 1 10 <sup>14</sup> 3 10 <sup>12</sup> 4 10 <sup>13</sup> 3 10 <sup>15</sup> 1 10 <sup>16</sup>
Cerium Ce-134 Ce-135 Ce-137 Ce-137m Ce-139 Ce-141 Ce-143 Ce-144		1 10 <sup>13</sup> 2 10 <sup>12</sup> 2 10 <sup>13</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>11</sup>
Chlorine Cl-36 Cl-38 Cl-39		2 10 <sup>12</sup> 6 10 <sup>11</sup> 1 10 <sup>12</sup>
Chromium Cr-48 Cr-49 Cr-51		4 10 <sup>13</sup> 2 10 <sup>12</sup> 3 10 <sup>13</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Cobalt Co-55 Co-56 Co-57 Co-58 Co-58m Co-60 Co-60m Co-61 Co-62m		2 10 <sup>12</sup> 2 10 <sup>11</sup> 1 10 <sup>12</sup> 6 10 <sup>11</sup> 2 10 <sup>13</sup> 6 10 <sup>10</sup> 7 10 <sup>12</sup> 2 10 <sup>12</sup> 9 10 <sup>11</sup>
Copper Cu-60 Cu-61 Cu-64 Cu-67		1 10 <sup>12</sup> 2 10 <sup>12</sup> 4 10 <sup>12</sup> 3 10 <sup>12</sup>
Curium Cm-238 Cm-240 Cm-241 Cm-242 Cm-243 Cm-244 Cm-245 Cm-246 Cm-247 Cm-248 Cm-249 Cm-250		5 10 <sup>12</sup> 7 10 <sup>9</sup> 5 10 <sup>11</sup> 4 10 <sup>9</sup> 4 10 <sup>8</sup> 4 10 <sup>8</sup> 2 10 <sup>8</sup> 2 10 <sup>8</sup> 3 10 <sup>8</sup> 7 10 <sup>7</sup> 2 10 <sup>12</sup> 1 10 <sup>7</sup>
Dysprosium Dy-155 Dy-157 Dy-159 Dy-165 Dy-166		1 10 <sup>13</sup> 1 10 <sup>14</sup> 8 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup>
Einsteinium Es-250 Es-251 Es-253 Es-254 Es-254m		1 10 <sup>13</sup> 6 10 <sup>12</sup> 8 10 <sup>9</sup> 2 10 <sup>9</sup> 5 10 <sup>10</sup>
Erbium Er-161 Er-165 Er-169 Er-171 Er-172		6 10 <sup>12</sup> 2 10 <sup>14</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup>
Europium Eu-145 Eu-146 Eu-147 Eu-148 Eu-149 Eu-150 Eu-150 Eu-152 Eu-152m Eu-154 Eu-155 Eu-156 Eu-157 Eu-158	(long lived isotope) (short lived isotope)	4 10 <sup>12</sup> 3 10 <sup>12</sup> 4 10 <sup>12</sup> 4 10 <sup>11</sup> 8 10 <sup>12</sup> 1 10 <sup>11</sup> 2 10 <sup>12</sup> 1 10 <sup>11</sup> 2 10 <sup>12</sup> 1 10 <sup>11</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Fermium Fm-252 Fm-253 Fm-254 Fm-255 Fm-257		7 10 <sup>10</sup> 6 10 <sup>10</sup> 3 10 <sup>11</sup> 9 10 <sup>10</sup> 3 10 <sup>9</sup>
Fluorine F-18		2 10 <sup>12</sup>
Francium Fr-222 Fr-223		1 10 <sup>12</sup> 2 10 <sup>12</sup>
Gadolinium Gd-145 Gd-146 Gd-147 Gd-148 Gd-149 Gd-151 Gd-152 Gd-153 Gd-159		2 10 <sup>12</sup> 2 10 <sup>12</sup> 5 10 <sup>12</sup> 9 10 <sup>8</sup> 6 10 <sup>12</sup> 5 10 <sup>12</sup> 1 10 <sup>9</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Gallium Ga-65 Ga-66 Ga-67 Ga-68 Ga-70 Ga-72 Ga-73		1 10 <sup>12</sup> 9 10 <sup>11</sup> 5 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Germanium Ge-66 Ge-67 Ge-68 Ge-69 Ge-71 Ge-75 Ge-77 Ge-78		3 10 <sup>12</sup> 7 10 <sup>11</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup> 7 10 <sup>14</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup>
Gold Au-193 Au-194 Au-195 Au-198 Au-198m Au-199 Au-200 Au-200m Au-201		7 10 <sup>12</sup> 1 10 <sup>13</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Hafnium Hf-170 Hf-172 Hf-173 Hf-175 Hf-177m Hf-178m Hf-179m Hf-180m Hf-181 Hf-182 Hf-182m Hf-183 Hf-184		4 10 <sup>12</sup> 5 10 <sup>11</sup> 6 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 4 10 <sup>10</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 7 10 <sup>10</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Holmium Ho-155 Ho-157 Ho-159 Ho-161 Ho-162 Ho-162m Ho-164 Ho-164m Ho-166 Ho-166m Ho-167		2 10 <sup>12</sup> 4 10 <sup>12</sup> 6 10 <sup>12</sup> 1 10 <sup>13</sup> 5 10 <sup>12</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 4 10 <sup>12</sup> 1 10 <sup>12</sup> 8 10 <sup>10</sup> 2 10 <sup>12</sup>
Hydrogen H-3 H-3 H-3 H-3 H-3	(tritiated water) (organically bound tritium) (tritiated water vapour) (gas) (tritiated methane gas) (organically bound tritium gas/ vapour)	7 10 <sup>13</sup> 1 10 <sup>14</sup> 1 10 <sup>15</sup> 1 10 <sup>18</sup> 1 10 <sup>17</sup> 6 10 <sup>14</sup>
Indium In-109 In-110 In-110 In-111 In-112 In-113m In-114 In-114m In-115 In-115m In-116m In-117 In-117m In-119m	(long lived isotope) (short lived isotope)	7 10 <sup>12</sup> 2 10 <sup>13</sup> 1 10 <sup>12</sup> 9 10 <sup>12</sup> 2 10 <sup>12</sup> 5 10 <sup>12</sup> 1 10 <sup>12</sup> 9 10 <sup>11</sup> 6 10 <sup>10</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 9 10 <sup>11</sup>
Iodine I-120 I-120 I-120 I-120m I-120m I-120m I-121 I-121 I-121 I-121 I-123 I-123 I-123 I-123 I-124 I-124 I-124 I-124 I-125 I-125 I-125 I-125 I-126 I-126 I-126 I-126 I-128 I-128 I-128 I-129 I-129 I-129 I-130 I-130	(elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour) (methyl iodide vapour) (elemental vapour)	6 10 <sup>11</sup> 2 10 <sup>13</sup> 2 10 <sup>13</sup> 7 10 <sup>11</sup> 2 10 <sup>13</sup> 2 10 <sup>13</sup> 4 10 <sup>12</sup> 1 10 <sup>14</sup> 1 10 <sup>14</sup> 9 10 <sup>12</sup> 5 10 <sup>13</sup> 6 10 <sup>13</sup> 2 10 <sup>12</sup> 9 10 <sup>11</sup> 1 10 <sup>12</sup> 1 10 <sup>11</sup> 1 10 <sup>12</sup> 1 10 <sup>12</sup> 8 10 <sup>11</sup> 5 10 <sup>11</sup> 6 10 <sup>11</sup> 1 10 <sup>12</sup> 2 10 <sup>14</sup> 5 10 <sup>14</sup> 1 10 <sup>10</sup> 2 10 <sup>11</sup> 2 10 <sup>11</sup> 3 10 <sup>12</sup> 5 10 <sup>12</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
I-130	(methyl iodide vapour)	6 10 <sup>12</sup>
I-131		9 10 <sup>10</sup>
I-131	(elemental vapour)	6 10 <sup>11</sup>
I-131	(methyl iodide vapour)	7 10 <sup>11</sup>
I-132		2 10 <sup>12</sup>
I-132	(elemental vapour)	2 10 <sup>13</sup>
I-132	(methyl iodide vapour)	3 10 <sup>13</sup>
I-132m		2 10 <sup>12</sup>
I-132m	(elemental vapour)	4 10 <sup>13</sup>
I-132m	(methyl iodide vapour)	5 10 <sup>13</sup>
I-133		2 10 <sup>12</sup>
I-133	(elemental vapour)	2 10 <sup>12</sup>
I-133	(methyl iodide vapour)	3 10 <sup>12</sup>
I-134		2 10 <sup>12</sup>
I-134	(elemental vapour)	3 10 <sup>13</sup>
I-134	(methyl iodide vapour)	4 10 <sup>13</sup>
I-135		2 10 <sup>12</sup>
I-135	(elemental vapour)	9 10 <sup>12</sup>
I-135	(methyl iodide vapour)	1 10 <sup>13</sup>
Iridium		
Ir-182		1 10 <sup>12</sup>
Ir-184		2 10 <sup>12</sup>
Ir-185		3 10 <sup>12</sup>
Ir-186	(long lived isotope)	3 10 <sup>12</sup>
Ir-186	(short lived isotope)	2 10 <sup>12</sup>
Ir-187		6 10 <sup>12</sup>
Ir-188		5 10 <sup>12</sup>
Ir-189		9 10 <sup>12</sup>
Ir-190		2 10 <sup>12</sup>
Ir-190m	(long lived isotope)	3 10 <sup>12</sup>
Ir-190m	(short lived isotope)	1 10 <sup>13</sup>
Ir-192		6 10 <sup>11</sup>
Ir-192m		4 10 <sup>11</sup>
Ir-193m		4 10 <sup>12</sup>
Ir-194		1 10 <sup>12</sup>
Ir-194m		1 10 <sup>11</sup>
Ir-195		2 10 <sup>12</sup>
Ir-195m		2 10 <sup>12</sup>
Iron		
Fe-52		2 10 <sup>12</sup>
Fe-55		8 10 <sup>12</sup>
Fe-59		8 10 <sup>11</sup>
Fe-60		4 10 <sup>10</sup>
Krypton		
Kr-74	(gas)	5 10 <sup>13</sup>
Kr-76	(gas)	1 10 <sup>14</sup>
Kr-77	(gas)	6 10 <sup>13</sup>
Kr-79	(gas)	2 10 <sup>14</sup>
Kr-81	(gas)	7 10 <sup>15</sup>
Kr-81m	(gas)	5 10 <sup>14</sup>
Kr-83m	(gas)	3 10 <sup>16</sup>
Kr-85	(gas)	1 10 <sup>16</sup>
Kr-85m	(gas)	4 10 <sup>14</sup>
Kr-87	(gas)	7 10 <sup>13</sup>
Kr-88	(gas)	3 10 <sup>13</sup>



Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Lanthanum La-131 La-132 La-135 La-137 La-138 La-140 La-141 La-142 La-143		2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>14</sup> 2 10 <sup>12</sup> 2 10 <sup>11</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 1 10 <sup>12</sup> 7 10 <sup>11</sup>
Lead Pb-195m Pb-198 Pb-199 Pb-200 Pb-201 Pb-202 Pb-202m Pb-203 Pb-205 Pb-209 Pb-210 Pb-211 Pb-212 Pb-214		2 10 <sup>12</sup> 4 10 <sup>12</sup> 6 10 <sup>12</sup> 3 10 <sup>12</sup> 8 10 <sup>12</sup> 6 10 <sup>11</sup> 4 10 <sup>12</sup> 9 10 <sup>12</sup> 1 10 <sup>13</sup> 2 10 <sup>12</sup> 3 10 <sup>9</sup> 2 10 <sup>12</sup> 1 10 <sup>11</sup> 1 10 <sup>12</sup>
Lutetium Lu-169 Lu-170 Lu-171 Lu-172 Lu-173 Lu-174 Lu-174m Lu-176 Lu-176m Lu-177 Lu-177m Lu-178 Lu-178m Lu-179		6 10 <sup>12</sup> 3 10 <sup>12</sup> 4 10 <sup>12</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 3 10 <sup>12</sup> 3 10 <sup>11</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup> 3 10 <sup>11</sup> 1 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup>
Magnesium Mg-28		5 10 <sup>12</sup>
Manganese Mn-51 Mn-52 Mn-52m Mn-53 Mn-54 Mn-56		1 10 <sup>12</sup> 2 10 <sup>12</sup> 8 10 <sup>11</sup> 1 10 <sup>14</sup> 3 10 <sup>11</sup> 1 10 <sup>12</sup>
Mendelevium Md-257 Md-258		9 10 <sup>11</sup> 4 10 <sup>9</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Mercury		
Hg-193	(organic)	3 10 <sup>12</sup>
Hg-193	(inorganic)	3 10 <sup>12</sup>
Hg-193	(vapour)	2 10 <sup>13</sup>
Hg-193m	(organic)	2 10 <sup>12</sup>
Hg-193m	(inorganic)	2 10 <sup>12</sup>
Hg-193m	(vapour)	6 10 <sup>12</sup>
Hg-194	(organic)	3 10 <sup>11</sup>
Hg-194	(inorganic)	1 10 <sup>12</sup>
Hg-194	(vapour)	6 10 <sup>11</sup>
Hg-195	(organic)	5 10 <sup>12</sup>
Hg-195	(inorganic)	5 10 <sup>12</sup>
Hg-195	(vapour)	1 10 <sup>13</sup>
Hg-195m	(organic)	3 10 <sup>12</sup>
Hg-195m	(inorganic)	3 10 <sup>12</sup>
Hg-195m	(vapour)	3 10 <sup>12</sup>
Hg-197	(organic)	7 10 <sup>12</sup>
Hg-197	(inorganic)	7 10 <sup>12</sup>
Hg-197	(vapour)	5 10 <sup>12</sup>
Hg-197m	(organic)	2 10 <sup>12</sup>
Hg-197m	(inorganic)	2 10 <sup>12</sup>
Hg-197m	(vapour)	4 10 <sup>12</sup>
Hg-199m	(organic)	2 10 <sup>12</sup>
Hg-199m	(inorganic)	2 10 <sup>12</sup>
Hg-199m	(vapour)	1 10 <sup>14</sup>
Hg-203	(organic)	3 10 <sup>12</sup>
Hg-203	(inorganic)	3 10 <sup>12</sup>
Hg-203	(vapour)	3 10 <sup>12</sup>
Molybdenum		
Mo-90		2 10 <sup>12</sup>
Mo-93		2 10 <sup>12</sup>
Mo-93m		4 10 <sup>12</sup>
Mo-99		2 10 <sup>12</sup>
Mo-101		2 10 <sup>12</sup>
Neodymium		
Nd-136		4 10 <sup>12</sup>
Nd-138		5 10 <sup>13</sup>
Nd-139		2 10 <sup>12</sup>
Nd-139m		3 10 <sup>12</sup>
Nd-141		2 10 <sup>13</sup>
Nd-147		2 10 <sup>12</sup>
Nd-149		2 10 <sup>12</sup>
Nd-151		1 10 <sup>12</sup>
Neon		
Ne-19	(gas)	6 10 <sup>13</sup>
Neptunium		
Np-232		3 10 <sup>12</sup>
Np-233		2 10 <sup>14</sup>
Np-234		5 10 <sup>12</sup>
Np-235		2 10 <sup>13</sup>
Np-236	(long lived isotope)	3 10 <sup>9</sup>
Np-236	(short lived isotope)	3 10 <sup>12</sup>
Np-237		5 10 <sup>8</sup>
Np-238		2 10 <sup>12</sup>
Np-239		1 10 <sup>12</sup>
Np-240		7 10 <sup>11</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Nickel Ni-56		4 10 <sup>12</sup>
Ni-56	(carbonyl vapour)	1 10 <sup>13</sup>
Ni-57		2 10 <sup>12</sup>
Ni-57	(carbonyl vapour)	2 10 <sup>13</sup>
Ni-59		4 10 <sup>13</sup>
Ni-59	(carbonyl vapour)	2 10 <sup>13</sup>
Ni-63		1 10 <sup>13</sup>
Ni-63	(carbonyl vapour)	1 10 <sup>13</sup>
Ni-65		1 10 <sup>12</sup>
Ni-65	(carbonyl vapour)	4 10 <sup>13</sup>
Ni-66		5 10 <sup>12</sup>
Ni-66	(carbonyl vapour)	1 10 <sup>13</sup>
Niobium Nb-88		7 10 <sup>11</sup>
Nb-89	(long lived isotope)	1 10 <sup>12</sup>
Nb-89	(short lived isotope)	8 10 <sup>11</sup>
Nb-90		2 10 <sup>12</sup>
Nb-93m		1 10 <sup>13</sup>
Nb-94		1 10 <sup>11</sup>
Nb-95		2 10 <sup>12</sup>
Nb-95m		2 10 <sup>12</sup>
Nb-96		2 10 <sup>12</sup>
Nb-97		2 10 <sup>12</sup>
Nb-98		1 10 <sup>12</sup>
Nitrogen N-13	(gas)	6 10 <sup>13</sup>
Osmium Os-180		1 10 <sup>13</sup>
Os-181		3 10 <sup>12</sup>
Os-182		6 10 <sup>12</sup>
Os-185		7 10 <sup>11</sup>
Os-189m		1 10 <sup>13</sup>
Os-191		4 10 <sup>12</sup>
Os-191m		7 10 <sup>12</sup>
Os-193		2 10 <sup>12</sup>
Os-194		2 10 <sup>11</sup>
Palladium Pd-100		7 10 <sup>12</sup>
Pd-101		8 10 <sup>12</sup>
Pd-103		4 10 <sup>13</sup>
Pd-107		3 10 <sup>13</sup>
Pd-109		2 10 <sup>12</sup>
Phosphorus P-32		1 10 <sup>11</sup>
P-33		3 10 <sup>12</sup>
Platinum Pt-186		9 10 <sup>13</sup>
Pt-188		6 10 <sup>12</sup>
Pt-189		6 10 <sup>12</sup>
Pt-191		7 10 <sup>12</sup>
Pt-193		1 10 <sup>14</sup>
Pt-193m		3 10 <sup>12</sup>
Pt-195m		3 10 <sup>12</sup>
Pt-197		2 10 <sup>12</sup>
Pt-197m		2 10 <sup>12</sup>
Pt-199		2 10 <sup>12</sup>
Pt-200		2 10 <sup>12</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Plutonium Pu-234 Pu-235 Pu-236 Pu-237 Pu-238 Pu-239 Pu-240 Pu-241 Pu-242 Pu-243 Pu-244 Pu-245 Pu-246		1 10 <sup>12</sup> 2 10 <sup>13</sup> 6 10 <sup>8</sup> 1 10 <sup>13</sup> 2 10 <sup>8</sup> 2 10 <sup>8</sup> 2 10 <sup>8</sup> 1 10 <sup>10</sup> 2 10 <sup>8</sup> 2 10 <sup>12</sup> 2 10 <sup>8</sup> 2 10 <sup>12</sup> 2 10 <sup>8</sup>
Polonium Po-203 Po-205 Po-206 Po-207 Po-208 Po-209 Po-210		3 10 <sup>12</sup> 7 10 <sup>12</sup> 1 10 <sup>11</sup> 8 10 <sup>12</sup> 2 10 <sup>9</sup> 2 10 <sup>9</sup> 4 10 <sup>9</sup>
Potassium K-40 K-42 K-43 K-44 K-45		2 10 <sup>12</sup> 7 10 <sup>11</sup> 2 10 <sup>12</sup> 6 10 <sup>11</sup> 9 10 <sup>11</sup>
Praseodymium Pr-136 Pr-137 Pr-138m Pr-139 Pr-142 Pr-142m Pr-143 Pr-144 Pr-145 Pr-147		1 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 7 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>15</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 1 10 <sup>12</sup>
Promethium Pm-141 Pm-143 Pm-144 Pm-145 Pm-146 Pm-147 Pm-148 Pm-148m Pm-149 Pm-150 Pm-151		1 10 <sup>12</sup> 9 10 <sup>11</sup> 2 10 <sup>11</sup> 3 10 <sup>12</sup> 2 10 <sup>11</sup> 4 10 <sup>12</sup> 1 10 <sup>12</sup> 5 10 <sup>11</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup>
Protactinium Pa-227 Pa-228 Pa-230 Pa-231 Pa-232 Pa-233 Pa-234		3 10 <sup>11</sup> 3 10 <sup>11</sup> 3 10 <sup>10</sup> 2 10 <sup>8</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 5 10 <sup>11</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Radium Ra-223 Ra-224 Ra-225 Ra-226 Ra-227 Ra-228		3 10 <sup>9</sup> 7 10 <sup>9</sup> 3 10 <sup>9</sup> 2 10 <sup>9</sup> 2 10 <sup>12</sup> 1 10 <sup>9</sup>
Rhenium Re-177 Re-178 Re-181 Re-182 Re-182 Re-184 Re-184m Re-186 Re-186m Re-187 Re-188 Re-188m Re-189	(long lived isotope) (short lived isotope)	2 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 4 10 <sup>12</sup> 1 10 <sup>12</sup> 7 10 <sup>11</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 5 10 <sup>14</sup> 1 10 <sup>12</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup>
Rhodium Rh-99 Rh-99m Rh-100 Rh-101 Rh-101m Rh-102 Rh-102m Rh-103m Rh-105 Rh-106m Rh-107		4 10 <sup>12</sup> 9 10 <sup>12</sup> 4 10 <sup>12</sup> 7 10 <sup>11</sup> 2 10 <sup>13</sup> 1 10 <sup>11</sup> 6 10 <sup>11</sup> 3 10 <sup>15</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Rubidium Rb-79 Rb-81 Rb-81m Rb-82m Rb-83 Rb-84 Rb-86 Rb-87 Rb-88 Rb-89		1 10 <sup>12</sup> 2 10 <sup>12</sup> 4 10 <sup>12</sup> 3 10 <sup>12</sup> 1 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>11</sup> 4 10 <sup>12</sup> 5 10 <sup>11</sup> 9 10 <sup>11</sup>
Ruthenium Ru-94 Ru-94 Ru-97 Ru-97 Ru-103 Ru-103 Ru-105 Ru-105 Ru-106 Ru-106	(tetroxide vapour) (tetroxide vapour) (tetroxide vapour) (tetroxide vapour) (tetroxide vapour) (tetroxide vapour)	1 10 <sup>14</sup> 1 10 <sup>14</sup> 3 10 <sup>13</sup> 1 10 <sup>14</sup> 2 10 <sup>12</sup> 1 10 <sup>13</sup> 2 10 <sup>12</sup> 6 10 <sup>13</sup> 3 10 <sup>11</sup> 8 10 <sup>11</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Samarium Sm-141 Sm-141m Sm-142 Sm-145 Sm-146 Sm-147 Sm-151 Sm-153 Sm-155 Sm-156		1 10 <sup>12</sup> 2 10 <sup>12</sup> 9 10 <sup>12</sup> 3 10 <sup>12</sup> 2 10 <sup>9</sup> 3 10 <sup>9</sup> 6 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Scandium Sc-43 Sc-44 Sc-44m Sc-46 Sc-47 Sc-48 Sc-49		2 10 <sup>12</sup> 2 10 <sup>12</sup> 9 10 <sup>12</sup> 3 10 <sup>11</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup>
Selenium Se-70 Se-73 Se-73m Se-75 Se-79 Se-81 Se-81m Se-83		2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>11</sup> 5 10 <sup>10</sup> 2 10 <sup>12</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup>
Silicon Si-31 Si-32		2 10 <sup>12</sup> 2 10 <sup>11</sup>
Silver Ag-102 Ag-103 Ag-104 Ag-104m Ag-105 Ag-106 Ag-106m Ag-108m Ag-110m Ag-111 Ag-112 Ag-115		1 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>11</sup> 3 10 <sup>10</sup> 2 10 <sup>12</sup> 7 10 <sup>11</sup> 9 10 <sup>11</sup>
Sodium Na-22 Na-24		1 10 <sup>11</sup> 2 10 <sup>12</sup>
Strontium Sr-80 Sr-81 Sr-82 Sr-83 Sr-85 Sr-85m Sr-87m Sr-89 Sr-90 Sr-91 Sr-92		1 10 <sup>14</sup> 9 10 <sup>11</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup> 1 10 <sup>12</sup> 3 10 <sup>13</sup> 7 10 <sup>12</sup> 1 10 <sup>12</sup> 8 10 <sup>10</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Sulphur		
S-35	(inorganic)	1 10 <sup>12</sup>
S-35	(organic)	2 10 <sup>11</sup>
S-35	(carbon disulphide vapour)	2 10 <sup>13</sup>
S-35	(vapour)	2 10 <sup>14</sup>
S-35	(dioxide gas)	1 10 <sup>14</sup>
Tantalum		
Ta-172		2 10 <sup>12</sup>
Ta-173		2 10 <sup>12</sup>
Ta-174		2 10 <sup>12</sup>
Ta-175		2 10 <sup>12</sup>
Ta-176		3 10 <sup>12</sup>
Ta-177		1 10 <sup>13</sup>
Ta-178	(long lived isotope)	3 10 <sup>12</sup>
Ta-179		6 10 <sup>12</sup>
Ta-180		9 10 <sup>11</sup>
Ta-180m		6 10 <sup>12</sup>
Ta-182		3 10 <sup>11</sup>
Ta-182m		2 10 <sup>12</sup>
Ta-183		2 10 <sup>12</sup>
Ta-184		2 10 <sup>12</sup>
Ta-185		1 10 <sup>12</sup>
Ta-186		9 10 <sup>11</sup>
Technetium		
Tc-93		5 10 <sup>13</sup>
Tc-93m		4 10 <sup>12</sup>
Tc-94		6 10 <sup>12</sup>
Tc-94m		1 10 <sup>12</sup>
Tc-95		4 10 <sup>13</sup>
Tc-95m		1 10 <sup>12</sup>
Tc-96		4 10 <sup>12</sup>
Tc-96m		2 10 <sup>13</sup>
Tc-97		9 10 <sup>12</sup>
Tc-97m		5 10 <sup>12</sup>
Tc-98		1 10 <sup>11</sup>
Tc-99		5 10 <sup>10</sup>
Tc-99m		1 10 <sup>13</sup>
Tc-101		2 10 <sup>12</sup>
Tc-104		6 10 <sup>11</sup>
Tellurium		
Te-116		6 10 <sup>12</sup>
Te-116	(vapour)	2 10 <sup>14</sup>
Te-121		4 10 <sup>12</sup>
Te-121	(vapour)	3 10 <sup>13</sup>
Te-121m		1 10 <sup>12</sup>
Te-121m	(vapour)	3 10 <sup>12</sup>
Te-123		6 10 <sup>12</sup>
Te-123	(vapour)	2 10 <sup>12</sup>
Te-123m		2 10 <sup>12</sup>
Te-123m	(vapour)	5 10 <sup>12</sup>
Te-125m		2 10 <sup>12</sup>
Te-125m	(vapour)	8 10 <sup>12</sup>
Te-127		2 10 <sup>12</sup>
Te-127	(vapour)	2 10 <sup>14</sup>
Te-127m		1 10 <sup>12</sup>
Te-127m	(vapour)	2 10 <sup>12</sup>
Te-129		2 10 <sup>12</sup>
Te-129	(vapour)	4 10 <sup>14</sup>
Te-129m		1 10 <sup>12</sup>
Te-129m	(vapour)	3 10 <sup>12</sup>
Te-131		1 10 <sup>12</sup>
Te-131	(vapour)	1 10 <sup>14</sup>
Te-131m		2 10 <sup>12</sup>
Te-131m	(vapour)	5 10 <sup>12</sup>
Te-132		3 10 <sup>12</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Te-132	(vapour)	2 10 <sup>12</sup>
Te-133		1 10 <sup>12</sup>
Te-133	(vapour)	7 10 <sup>13</sup>
Te-133m		1 10 <sup>12</sup>
Te-133m	(vapour)	2 10 <sup>13</sup>
Te-134		3 10 <sup>12</sup>
Te-134	(vapour)	7 10 <sup>13</sup>
Terbium		
Tb-147		2 10 <sup>12</sup>
Tb-149		2 10 <sup>12</sup>
Tb-150		2 10 <sup>12</sup>
Tb-151		4 10 <sup>12</sup>
Tb-153		7 10 <sup>12</sup>
Tb-154		4 10 <sup>12</sup>
Tb-155		1 10 <sup>13</sup>
Tb-156		3 10 <sup>12</sup>
Tb-156m	(long lived isotope)	1 10 <sup>13</sup>
Tb-156m	(short lived isotope)	4 10 <sup>12</sup>
Tb-157		1 10 <sup>13</sup>
Tb-158		2 10 <sup>11</sup>
Tb-160		5 10 <sup>11</sup>
Tb-161		2 10 <sup>12</sup>
Thallium		
Tl-194		1 10 <sup>13</sup>
Tl-194m		2 10 <sup>12</sup>
Tl-195		4 10 <sup>12</sup>
Tl-197		5 10 <sup>12</sup>
Tl-198		7 10 <sup>12</sup>
Tl-198m		2 10 <sup>12</sup>
Tl-199		6 10 <sup>12</sup>
Tl-200		1 10 <sup>13</sup>
Tl-201		7 10 <sup>12</sup>
Tl-202		7 10 <sup>12</sup>
Tl-204		2 10 <sup>12</sup>
Thorium		
Th-226		4 10 <sup>11</sup>
Th-227		2 10 <sup>9</sup>
Th-228		6 10 <sup>8</sup>
Th-229		1 10 <sup>8</sup>
Th-230		2 10 <sup>8</sup>
Th-231		2 10 <sup>12</sup>
Th-232		2 10 <sup>8</sup>
Th-234		3 10 <sup>12</sup>
Thulium		
Tm-162		2 10 <sup>12</sup>
Tm-166		3 10 <sup>12</sup>
Tm-167		4 10 <sup>12</sup>
Tm-170		2 10 <sup>12</sup>
Tm-171		1 10 <sup>13</sup>
Tm-172		2 10 <sup>12</sup>
Tm-173		2 10 <sup>12</sup>
Tm-175		2 10 <sup>12</sup>



Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Tin Sn-110 Sn-111 Sn-113 Sn-117m Sn-119m Sn-121 Sn-121m Sn-123 Sn-123m Sn-125 Sn-126 Sn-127 Sn-128		6 10 <sup>13</sup> 2 10 <sup>12</sup> 5 10 <sup>12</sup> 3 10 <sup>12</sup> 5 10 <sup>12</sup> 3 10 <sup>12</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 5 10 <sup>11</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Titanium Ti-44 Ti-45		2 10 <sup>11</sup> 2 10 <sup>12</sup>
Tungsten W-176 W-177 W-178 W-179 W-181 W-185 W-187 W-188		5 10 <sup>12</sup> 3 10 <sup>12</sup> 6 10 <sup>13</sup> 1 10 <sup>13</sup> 1 10 <sup>13</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup>
Uranium U-230 U-231 U-232 U-233 U-234 U-235 U-236 U-237 U-238 U-239 U-240		2 10 <sup>9</sup> 7 10 <sup>12</sup> 6 10 <sup>8</sup> 3 10 <sup>9</sup> 3 10 <sup>9</sup> 3 10 <sup>9</sup> 3 10 <sup>9</sup> 2 10 <sup>12</sup> 3 10 <sup>9</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Vanadium V-47 V-48 V-49		1 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>14</sup>
Xenon Xe-120 Xe-121 Xe-122 Xe-123 Xe-125 Xe-127 Xe-129m Xe-131m Xe-133 Xe-133m Xe-135 Xe-135m Xe-138	(gas) (gas) (gas) (gas) (gas) (gas) (gas) (gas) (gas) (gas) (gas) (gas) (gas)	1 10 <sup>14</sup> 3 10 <sup>13</sup> 1 10 <sup>15</sup> 9 10 <sup>13</sup> 2 10 <sup>14</sup> 2 10 <sup>14</sup> 2 10 <sup>15</sup> 4 10 <sup>15</sup> 1 10 <sup>15</sup> 2 10 <sup>15</sup> 2 10 <sup>14</sup> 1 10 <sup>14</sup> 5 10 <sup>13</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Ytterbium Yb-162 Yb-166 Yb-167 Yb-169 Yb-175 Yb-177 Yb-178		1 10 <sup>13</sup> 8 10 <sup>12</sup> 4 10 <sup>12</sup> 3 10 <sup>12</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
Yttrium Y-86 Y-86m Y-87 Y-88 Y-90 Y-90m Y-91 Y-91m Y-92 Y-93 Y-94 Y-95		2 10 <sup>12</sup> 1 10 <sup>13</sup> 2 10 <sup>13</sup> 2 10 <sup>11</sup> 2 10 <sup>12</sup> 7 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>13</sup> 6 10 <sup>11</sup> 8 10 <sup>11</sup> 6 10 <sup>11</sup> 6 10 <sup>11</sup>
Zinc Zn-62 Zn-63 Zn-65 Zn-69 Zn-69m Zn-71m Zn-72		1 10 <sup>13</sup> 1 10 <sup>12</sup> 5 10 <sup>10</sup> 2 10 <sup>12</sup> 2 10 <sup>13</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup>
Zirconium Zr-86 Zr-88 Zr-89 Zr-93 Zr-95 Zr-97		2 10 <sup>13</sup> 1 10 <sup>12</sup> 4 10 <sup>12</sup> 8 10 <sup>11</sup> 8 10 <sup>11</sup> 2 10 <sup>12</sup>
Other radionuclides not listed above (see note)		4 10 <sup>7</sup>

Note: In the case of radionuclides not specified elsewhere in this Part, the quantity specified in this entry is to be used unless the Executive has approved some other quantity for that radionuclide.

## PART II

### Quantity ratios for more than one radionuclide

1. For the purpose of regulation 3(2), the quantity ratio for more than one radionuclide is the sum of the quotients of the quantity of a radionuclide present  $Q_p$  divided by the quantity of that radionuclide specified in the appropriate column of Part I of this Schedule  $Q_{lim}$ , namely—

$$\sum \frac{Q_p}{Q_{lim}}$$

2. In any case where the isotopic composition of a radioactive substance is not known or is only partially known, the quantity ratio for that substance shall be calculated by using the values specified in the appropriate column in Part I for 'other radionuclides not listed above' for any radionuclide that has not been identified or where the quantity of a radionuclide is uncertain, unless the employer can show that the use of some other value is appropriate in the circumstances of a particular case, when he may use that value.

### SCHEDULE 3

Regulation 3(1)

#### MASSES OF FISSILE MATERIAL

For the purpose of regulation 3(1), the specified mass of a fissile material shall be—

- |  |            |
|--|------------|
| (a) plutonium as Pu 239 or Pu 241 or as a mixture of plutonium isotopes containing Pu 239 or Pu 241— | 150 grams; |
| (b) uranium as U233—   | 150 grams; |
| (c) uranium enriched in U 235 to more than 1% but not more than 5%—                                  | 500 grams; |
| (d) uranium enriched in U 235 to more than 5%—   | 250 grams. |

## SPECIFIED QUANTITIES FOR THE TRANSPORT OF RADIONUCLIDES

## PART I

Table of radionuclides

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Actinium Ac-225 Ac-227 Ac-228	(see note 1) (see note 1)	$6 \times 10^9$ $9 \times 10^7$ $5 \times 10^{11}$
Aluminium Al-26		$1 \times 10^{11}$
Americium Am-241 Am-242m Am-243	(see note 1) (see note 1)	$1 \times 10^9$ $1 \times 10^9$ $1 \times 10^9$
Antimony Sb-122 Sb-124 Sb-125 Sb-126		$4 \times 10^{11}$ $6 \times 10^{11}$ $1 \times 10^{12}$ $4 \times 10^{11}$
Argon Ar-37 Ar-39 Ar-41		$4 \times 10^{13}$ $2 \times 10^{13}$ $3 \times 10^{11}$
Arsenic As-72 As-73 As-74 As-76 As-77		$3 \times 10^{11}$ $4 \times 10^{13}$ $9 \times 10^{11}$ $3 \times 10^{11}$ $7 \times 10^{11}$
Astatine At-211	(see note 1)	$5 \times 10^{11}$
Barium Ba-131 Ba-133 Ba-133m Ba-140	(see note 1) (see note 1)	$2 \times 10^{12}$ $3 \times 10^{12}$ $6 \times 10^{11}$ $3 \times 10^{11}$
Berkelium Bk-247 Bk-249	(see note 1)	$8 \times 10^8$ $3 \times 10^{11}$
Beryllium Be-7 Be-10		$2 \times 10^{13}$ $6 \times 10^{11}$
Bismuth Bi-205 Bi-206 Bi-207 Bi-210 Bi-210m Bi-212	(see note 1) (see note 1)	$7 \times 10^{11}$ $3 \times 10^{11}$ $7 \times 10^{11}$ $6 \times 10^{11}$ $2 \times 10^{10}$ $6 \times 10^{11}$
Bromine Br-76 Br-77 Br-82		$4 \times 10^{11}$ $3 \times 10^{12}$ $4 \times 10^{11}$
Cadmium Cd-109 Cd-113m Cd-115 Cd-115m	(see note 1)	$2 \times 10^{12}$ $5 \times 10^{11}$ $4 \times 10^{11}$ $5 \times 10^{11}$

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Caesium Cs-129 Cs-131 Cs-132 Cs-134 Cs-134m Cs-135 Cs-136 Cs-137	(see note 1)	4 10 <sup>12</sup> 3 10 <sup>13</sup> 1 10 <sup>12</sup> 7 10 <sup>11</sup> 6 10 <sup>11</sup> 1 10 <sup>12</sup> 5 10 <sup>11</sup> 6 10 <sup>11</sup>
Calcium Ca-41 Ca-45 Ca-47	(see note 1)	unlimited 1 10 <sup>12</sup> 3 10 <sup>11</sup>
Californium Cf-248 Cf-249 Cf-250 Cf-251 Cf-252 Cf-253 Cf-254	(see note 1)	6 10 <sup>9</sup> 8 10 <sup>8</sup> 2 10 <sup>9</sup> 7 10 <sup>8</sup> 3 10 <sup>9</sup> 4 10 <sup>10</sup> 1 10 <sup>9</sup>
Carbon C-11 C-14		6 10 <sup>11</sup> 3 10 <sup>12</sup>
Cerium Ce-139 Ce-141 Ce-143 Ce-144	(see note 1)	2 10 <sup>12</sup> 6 10 <sup>11</sup> 6 10 <sup>11</sup> 2 10 <sup>11</sup>
Chlorine Cl-36 Cl-38		6 10 <sup>11</sup> 2 10 <sup>11</sup>
Chromium Cr-51		3 10 <sup>13</sup>
Cobalt Co-55 Co-56 Co-57 Co-58 Co-58m Co-60		5 10 <sup>11</sup> 3 10 <sup>11</sup> 1 10 <sup>13</sup> 1 10 <sup>12</sup> 4 10 <sup>13</sup> 4 10 <sup>11</sup>
Copper Cu-64 Cu-67		1 10 <sup>12</sup> 7 10 <sup>11</sup>
Curium Cm-240 Cm-241 Cm-242 Cm-243 Cm-244 Cm-245 Cm-246 Cm-247 Cm-248	(see note 1)	2 10 <sup>10</sup> 1 10 <sup>12</sup> 1 10 <sup>10</sup> 1 10 <sup>9</sup> 2 10 <sup>9</sup> 9 10 <sup>8</sup> 9 10 <sup>8</sup> 1 10 <sup>9</sup> 3 10 <sup>8</sup>
Dysprosium Dy-159 Dy-165 Dy-166	(see note 1)	2 10 <sup>13</sup> 6 10 <sup>11</sup> 3 10 <sup>11</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Erbium Er-169 Er-171		1 10 <sup>12</sup> 5 10 <sup>11</sup>
Europium Eu-147 Eu-148 Eu-149 Eu-150 Eu-150 Eu-152 Eu-152m Eu-154 Eu-155 Eu-156	(long lived isotope) (short lived isotope)	2 10 <sup>12</sup> 5 10 <sup>11</sup> 2 10 <sup>13</sup> 7 10 <sup>11</sup> 7 10 <sup>11</sup> 1 10 <sup>12</sup> 8 10 <sup>11</sup> 6 10 <sup>11</sup> 3 10 <sup>12</sup> 7 10 <sup>11</sup>
Fluorine F-18		6 10 <sup>11</sup>
Gadolinium Gd-146 Gd-148 Gd-153 Gd-159	(see note 1)	5 10 <sup>11</sup> 2 10 <sup>9</sup> 9 10 <sup>12</sup> 6 10 <sup>11</sup>
Gallium Ga-67 Ga-68 Ga-72		3 10 <sup>12</sup> 5 10 <sup>11</sup> 4 10 <sup>11</sup>
Germanium Ge-68 Ge-71 Ge-77	(see note 1)	5 10 <sup>11</sup> 4 10 <sup>13</sup> 3 10 <sup>11</sup>
Gold Au-193 Au-194 Au-195 Au-198 Au-199		2 10 <sup>12</sup> 1 10 <sup>12</sup> 6 10 <sup>12</sup> 6 10 <sup>11</sup> 6 10 <sup>11</sup>
Hafnium Hf-172 Hf-175 Hf-181 Hf-182	(see note 1)	6 10 <sup>11</sup> 3 10 <sup>12</sup> 5 10 <sup>11</sup> unlimited
Holmium Ho-166 Ho-166m		4 10 <sup>11</sup> 5 10 <sup>11</sup>
Hydrogen H-3		4 10 <sup>13</sup>
Indium In-111 In-113m In-114m In-115m	(see note 1)	3 10 <sup>12</sup> 2 10 <sup>12</sup> 5 10 <sup>11</sup> 1 10 <sup>12</sup>
Iodine I-123 I-124 I-125 I-126 I-129 I-131 I-132 I-133 I-134 I-135	(see note 1)	3 10 <sup>12</sup> 1 10 <sup>12</sup> 3 10 <sup>12</sup> 1 10 <sup>12</sup> unlimited 7 10 <sup>11</sup> 4 10 <sup>11</sup> 6 10 <sup>11</sup> 3 10 <sup>11</sup> 6 10 <sup>11</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Iridium Ir-189 Ir-190 Ir-192 Ir-194	(see note 1)	1 10 <sup>13</sup> 7 10 <sup>11</sup> 6 10 <sup>11</sup> 3 10 <sup>11</sup>
Iron Fe-52 Fe-55 Fe-59 Fe-60	(see note 1)   (see note 1)	3 10 <sup>11</sup> 4 10 <sup>13</sup> 9 10 <sup>11</sup> 2 10 <sup>11</sup>
Krypton Kr-81 Kr-85 Kr-85m Kr-87		4 10 <sup>13</sup> 1 10 <sup>13</sup> 3 10 <sup>12</sup> 2 10 <sup>11</sup>
Lanthanum La-137 La-140		6 10 <sup>12</sup> 4 10 <sup>11</sup>
Lead Pb-201 Pb-202 Pb-203 Pb-205 Pb-210 Pb-212	    (see note 1) (see note 1)	1 10 <sup>12</sup> 2 10 <sup>13</sup> 3 10 <sup>12</sup> unlimited 5 10 <sup>10</sup> 2 10 <sup>11</sup>
Lutetium Lu-172 Lu-173 Lu-174 Lu-174m Lu-177		6 10 <sup>11</sup> 8 10 <sup>12</sup> 9 10 <sup>12</sup> 1 10 <sup>13</sup> 7 10 <sup>11</sup>
Magnesium Mg-28	(see note 1)	3 10 <sup>11</sup>
Manganese Mn-52 Mn-53 Mn-54 Mn-56		3 10 <sup>11</sup> unlimited 1 10 <sup>12</sup> 3 10 <sup>11</sup>
Mercury Hg-194 Hg-195m Hg-197 Hg-197m Hg-203	(see note 1) (see note 1)	1 10 <sup>12</sup> 7 10 <sup>11</sup> 1 10 <sup>13</sup> 4 10 <sup>11</sup> 1 10 <sup>12</sup>
Molybdenum Mo-93 Mo-99	  (see note 1)	2 10 <sup>13</sup> 6 10 <sup>11</sup>
Neodymium Nd-147 Nd-149		6 10 <sup>11</sup> 5 10 <sup>11</sup>
Neptunium Np-235 Np-236 Np-236 Np-237 Np-239	  (long lived isotope) (short lived isotope)	4 10 <sup>13</sup> 2 10 <sup>10</sup> 2 10 <sup>12</sup> 2 10 <sup>9</sup> 4 10 <sup>11</sup>
Nickel Ni-59 Ni-63 Ni-65		unlimited 3 10 <sup>13</sup> 4 10 <sup>11</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Niobium Nb-93m Nb-94 Nb-95 Nb-97		3 10 <sup>13</sup> 7 10 <sup>11</sup> 1 10 <sup>12</sup> 6 10 <sup>11</sup>
Nitrogen N-13		6 10 <sup>11</sup>
Osmium Os-185 Os-191 Os-191m Os-193 Os-194	(see note 1)	1 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>13</sup> 6 10 <sup>11</sup> 3 10 <sup>11</sup>
Palladium Pd-103 Pd-107 Pd-109	(see note 1)	4 10 <sup>13</sup> unlimited 5 10 <sup>11</sup>
Phosphorus P-32 P-33		5 10 <sup>11</sup> 1 10 <sup>12</sup>
Platinum Pt-188 Pt-191 Pt-193 Pt-193m Pt-195m Pt-197 Pt-197m	(see note 1)	8 10 <sup>11</sup> 3 10 <sup>12</sup> 4 10 <sup>13</sup> 5 10 <sup>11</sup> 5 10 <sup>11</sup> 6 10 <sup>11</sup> 6 10 <sup>11</sup>
Plutonium Pu-236 Pu-237 Pu-238 Pu-239 Pu-240 Pu-241 Pu-242 Pu-244	(see note 1)      (see note 1) (see note 1)	3 10 <sup>9</sup> 2 10 <sup>13</sup> 1 10 <sup>9</sup> 1 10 <sup>9</sup> 1 10 <sup>9</sup> 6 10 <sup>10</sup> 1 10 <sup>9</sup> 1 10 <sup>9</sup>
Polonium Po-210		2 10 <sup>10</sup>
Potassium K-40 K-42 K-43		9 10 <sup>11</sup> 2 10 <sup>11</sup> 6 10 <sup>11</sup>
Praseodymium Pr-142 Pr-143		4 10 <sup>11</sup> 6 10 <sup>11</sup>
Promethium Pm-143 Pm-144 Pm-145 Pm-147 Pm-148m Pm-149 Pm-151	(see note 1)	3 10 <sup>12</sup> 7 10 <sup>11</sup> 1 10 <sup>13</sup> 2 10 <sup>12</sup> 7 10 <sup>11</sup> 6 10 <sup>11</sup> 6 10 <sup>11</sup>
Protactinium Pa-230 Pa-231 Pa-233	(see note 1)	7 10 <sup>10</sup> 4 10 <sup>8</sup> 7 10 <sup>11</sup>



Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Radium Ra-223 Ra-224 Ra-225 Ra-226 Ra-228	(see note 1) (see note 1) (see note 1) (see note 1) (see note 1)	$7 \cdot 10^9$ $2 \cdot 10^{10}$ $4 \cdot 10^9$ $3 \cdot 10^9$ $2 \cdot 10^{10}$
Radon Rn-222	(see note 1)	$4 \cdot 10^9$
Rhenium Re-184 Re-184m Re-186 Re-187 Re-188 Re-189 Re-natural	(see note 1)	$1 \cdot 10^{12}$ $1 \cdot 10^{12}$ $6 \cdot 10^{11}$ unlimited $4 \cdot 10^{11}$ $6 \cdot 10^{11}$ unlimited
Rhodium Rh-99 Rh-101 Rh-102 Rh-102m Rh-103m Rh-105		$2 \cdot 10^{12}$ $3 \cdot 10^{12}$ $5 \cdot 10^{11}$ $2 \cdot 10^{12}$ $4 \cdot 10^{13}$ $8 \cdot 10^{11}$
Rubidium Rb-81 Rb-83 Rb-84 Rb-86 Rb-87 Rb-natural	(see note 1)	$8 \cdot 10^{11}$ $2 \cdot 10^{12}$ $1 \cdot 10^{12}$ $5 \cdot 10^{11}$ unlimited unlimited
Ruthenium Ru-97 Ru-103 Ru-105 Ru-106	(see note 1) (see note 1)	$5 \cdot 10^{12}$ $2 \cdot 10^{12}$ $6 \cdot 10^{11}$ $2 \cdot 10^{11}$
Samarium Sm-145 Sm-147 Sm-151 Sm-153		$1 \cdot 10^{13}$ unlimited $1 \cdot 10^{13}$ $6 \cdot 10^{11}$
Scandium Sc-44 Sc-46 Sc-47 Sc-48		$5 \cdot 10^{11}$ $5 \cdot 10^{11}$ $7 \cdot 10^{11}$ $3 \cdot 10^{11}$
Selenium Se-75 Se-79		$3 \cdot 10^{12}$ $2 \cdot 10^{12}$
Silicon Si-31 Si-32		$6 \cdot 10^{11}$ $5 \cdot 10^{11}$
Silver Ag-105 Ag-108m Ag-110m Ag-111	(see note 1) (see note 1)	$2 \cdot 10^{12}$ $7 \cdot 10^{11}$ $4 \cdot 10^{11}$ $6 \cdot 10^{11}$
Sodium Na-22 Na-24		$5 \cdot 10^{11}$ $2 \cdot 10^{11}$

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Strontium Sr-82 Sr-85 Sr-85m Sr-87m Sr-89 Sr-90 Sr-91 Sr-92	(see note 1)	2 10 <sup>11</sup> 2 10 <sup>12</sup> 5 10 <sup>12</sup> 3 10 <sup>12</sup> 6 10 <sup>11</sup> 3 10 <sup>11</sup> 3 10 <sup>11</sup> 3 10 <sup>11</sup>
Sulphur S-35		3 10 <sup>12</sup>
Tantalum Ta-178 Ta-179 Ta-182	(long lived isotope)	8 10 <sup>11</sup> 3 10 <sup>13</sup> 5 10 <sup>11</sup>
Technetium Tc-95m Tc-96 Tc-96m Tc-97 Tc-97m Tc-98 Tc-99 Tc-99m	(see note 1)  (see note 1)	2 10 <sup>12</sup> 4 10 <sup>11</sup> 4 10 <sup>11</sup> unlimited 1 10 <sup>12</sup> 7 10 <sup>11</sup> 9 10 <sup>11</sup> 4 10 <sup>12</sup>
Tellurium Te-121 Te-121m Te-123m Te-125m Te-127 Te-127m Te-129 Te-129m Te-131m Te-132	(see note 1)	2 10 <sup>12</sup> 3 10 <sup>12</sup> 1 10 <sup>12</sup> 9 10 <sup>11</sup> 7 10 <sup>11</sup> 5 10 <sup>11</sup> 6 10 <sup>11</sup> 4 10 <sup>11</sup> 5 10 <sup>11</sup> 5 10 <sup>11</sup> 4 10 <sup>11</sup>
Terbium Tb-157 Tb-158 Tb-160		4 10 <sup>13</sup> 1 10 <sup>12</sup> 6 10 <sup>11</sup>
Thallium Tl-200 Tl-201 Tl-202 Tl-204		9 10 <sup>11</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 7 10 <sup>11</sup>
Thorium Th-227 Th-228 Th-229 Th-230 Th-231 Th-232 Th-234 Th-natural	(see note 1)  (see note 1)	5 10 <sup>9</sup> 1 10 <sup>9</sup> 5 10 <sup>8</sup> 1 10 <sup>9</sup> 2 10 <sup>10</sup> unlimited 3 10 <sup>11</sup> unlimited
Thulium Tm-167 Tm-170 Tm-171		8 10 <sup>11</sup> 6 10 <sup>11</sup> 4 10 <sup>13</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Tin Sn-113 Sn-117m Sn-119m Sn-121m Sn-123 Sn-125 Sn-126	(see note 1)	2 10 <sup>12</sup> 4 10 <sup>11</sup> 3 10 <sup>13</sup> 9 10 <sup>11</sup> 6 10 <sup>11</sup> 4 10 <sup>11</sup> 4 10 <sup>11</sup>
Titanium Ti-44	(see note 1)	4 10 <sup>11</sup>
Tungsten W-178 W-181 W-185 W-187 W-188	(see note 1)	5 10 <sup>12</sup> 3 10 <sup>13</sup> 8 10 <sup>11</sup> 6 10 <sup>11</sup> 3 10 <sup>11</sup>
Uranium U-230 U-230 U-230 U-232 U-232 U-232 U-233 U-233 U-233 U-233 U-234 U-234 U-234 U-234 U-235 U-236 U-236 U-236 U-238 U-natural U (enriched to 20% or less) U-depleted	(fast lung absorption, see notes 1 and 2) (medium lung absorption see notes 1 and 3) (slow lung absorption, see notes 1 and 4) (fast lung absorption, see note 2) (medium lung absorption, see note 3) (slow lung absorption, see note 4) (fast lung absorption, see note 2) (medium lung absorption, see note 3) (slow lung absorption, see note 4) (fast lung absorption, see note 2) (medium lung absorption, see note 3) (slow lung absorption, see note 4) (all lung absorption types, see notes 1, 2, 3 and 4) (fast lung absorption, see note 2) (medium lung absorption, see note 3) (slow lung absorption, see note 4) (all lung absorption types, see notes 2, 3 and 4) (see note 5)	1 10 <sup>11</sup> 4 10 <sup>9</sup> 3 10 <sup>9</sup> 1 10 <sup>10</sup> 7 10 <sup>9</sup> 1 10 <sup>9</sup> 9 10 <sup>10</sup> 2 10 <sup>10</sup> 6 10 <sup>9</sup> 9 10 <sup>10</sup> 2 10 <sup>10</sup> 6 10 <sup>9</sup> unlimited unlimited 2 10 <sup>10</sup> 6 10 <sup>9</sup> unlimited unlimited unlimited unlimited
Vanadium V-48 V-49		4 10 <sup>11</sup> 4 10 <sup>13</sup>
Xenon Xe-122 Xe-123 Xe-127 Xe-131m Xe-133 Xe-135	(see note 1)	4 10 <sup>11</sup> 7 10 <sup>11</sup> 2 10 <sup>12</sup> 4 10 <sup>13</sup> 1 10 <sup>13</sup> 2 10 <sup>12</sup>
Ytterbium Yb-169 Yb-175		1 10 <sup>12</sup> 9 10 <sup>11</sup>
Yttrium Y-87 Y-88 Y-90 Y-91 Y-91m Y-92 Y-93	(see note 1)	1 10 <sup>12</sup> 4 10 <sup>11</sup> 3 10 <sup>11</sup> 6 10 <sup>11</sup> 2 10 <sup>12</sup> 2 10 <sup>11</sup> 3 10 <sup>11</sup>

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Zinc Zn-65 Zn-69 Zn-69m	(see note 1)	2 10 <sup>12</sup> 6 10 <sup>11</sup> 6 10 <sup>11</sup>
<b>Zirconium</b> Zr-88 Zr-93 Zr-95 Zr-97	(see note 1) (see note 1)	3 10 <sup>12</sup> unlimited 8 10 <sup>11</sup> 4 10 <sup>11</sup>
Other radionuclides not listed above where only beta or gamma emitting nuclides are known to be present	(see note 6)	2 10 <sup>10</sup>
Other radionuclides not listed above where alpha emitting nuclides are known to be present or no relevant data are available	(see note 6)	9 10 <sup>7</sup>

Note 1: Values include contributions from daughter nuclides with half-lives less than 10 days.

Note 2: These values apply only to compounds of uranium that take the chemical form of UF<sub>6</sub>, UO<sub>2</sub>F<sub>2</sub> and UO<sub>2</sub>(NO<sub>3</sub>)<sub>2</sub> in both normal and accident conditions of transport.

Note 3: These values apply only to compounds of uranium that take the chemical form of O<sub>3</sub>, UF<sub>4</sub>, UCl<sub>4</sub> and hexavalent compounds other than those specified in Note 2 above in both normal and accident conditions of transport.

Note 4: These values apply to all compounds of uranium other than those specified in Notes 2 and 3 above.

Note 5: These values apply to *unirradiated uranium* only.

Note 6: In the case of radionuclides not specified elsewhere in this Part, the quantity specified in this entry is to be used unless the Executive has approved some other quantity for that radionuclide.

## PART II

### Quantity ratios for more than one radionuclide

1. For the purpose of regulation 3(3), the quantity ratio for more than one radionuclide is the sum of the quotients of the quantity of a radionuclide present  $Q_p$  divided by the quantity of that radionuclide specified in the appropriate column of Part I of this Schedule  $Q_{lim}$ , namely—

$$\sum \frac{Q_p}{Q_{lim}}$$

2. In any case where the isotopic composition of a radioactive substance is not known or is only partially known, the quantity ratio for that substance shall be calculated by using the values specified in the appropriate column in Part I for 'other radionuclides not listed above' for any radionuclide that has not been identified or where the quantity of a radionuclide is uncertain, unless the employer can show that the use of some other value is appropriate in the circumstances of a particular case, when he may use that value.

**PARTICULARS TO BE INCLUDED IN AN ASSESSMENT REPORT**

The following particulars are required to be included in an assessment report under regulation 6(4)—

- (a) the name and address of the operator or carrier;
- (b) the postal address of the premises where the radioactive substance will be processed, manufactured, used or stored, or where the facilities for processing, manufacture, use or storage exist or, in the case of transport, the postal address of the transport undertaking;
- (c) the date on which it is anticipated that the work with ionising radiation will commence or, if it has already commenced, a statement to that effect;
- (d) a general description of the premises or place including the geographical location, meteorological, geological, hydrographic conditions and, where material, the history of the premises, except that in the case of transport a general description shall be given of either—
  - (i) the starting and end points of the journey and transshipment points, or
  - (ii) the criteria to be used for route selection;
- (e) in the case of an assessment by an operator, a description of any radioactive substance on the premises which is likely to exceed any quantity or mass specified in Schedule 2 or Schedule 3, as the case may be, which description shall where practicable include details of the radionuclides present and their likely maximum quantities;
- (f) in the case of an assessment by a carrier, a description of any radioactive substance which is likely to exceed any quantity or mass specified in Schedule 4 or Schedule 3, as the case may be, which description shall where practicable include details of the radionuclides present and their likely maximum quantities;
- (g) except in the case of an assessment relating to transport, a plan of the premises in question and a map of the environs to a scale large enough to enable the premises and any features which could affect the general risk in an emergency to be identified;
- (h) a diagram and description of any single plant or enclosed system containing more than the quantity or mass of any radioactive substance specified in Schedule 2 or Schedule 3, as the case may be, or, in the case of the transport of more than the quantity or mass of any radioactive substance specified in Schedule 4 or Schedule 3, as the case may be, the nature of the containment for the radioactive substance, the type of vehicle and the means of securing the load within or on the vehicle;
- (i) those factors which could precipitate a major release of any radioactive substance and the measures to be taken to prevent or control such release and information showing the maximum quantity of radioactive substance which, in the event of a major failure of containment, would be released to the atmosphere including, in respect of premises, the identification of plant and other activities anywhere on the premises which could precipitate such release;
- (j) those factors which could precipitate a smaller but continuing release of any radioactive substance and the measures to be taken to prevent or control such releases to atmosphere;
- (k) those factors which could give rise to an incident involving the initiation of an unintended self-sustaining nuclear chain reaction or the loss of control of an intended self-sustaining nuclear chain reaction and, in either case, the measures to be taken to prevent or control any such incident;
- (l) information concerning the management systems and staffing arrangements by which the radioactive substance is controlled and by which the procedures are controlled;
- (m) except in the case of an assessment relating to transport, information about the size and distribution of the population in the vicinity of premises to which the report relates;
- (n) an assessment of the area which is likely to be affected by the dispersal of any radioactive substance as a result of any radiation emergency and the period of time over which such dispersal is likely to take place;
- (o) an assessment of the likely exposures to ionising radiation of any person or class of persons as a result of any radiation emergency; and
- (p) an assessment of the necessity for an emergency plan to be prepared by the operator or carrier.

**FURTHER PARTICULARS THAT THE EXECUTIVE MAY REQUIRE**

A further assessment and report may be required under regulation 6(5) in respect of the following matters—

- (a) the analysis carried out to establish the likely consequences of any hazard, including the likely doses of ionising radiation to which members of the public might be exposed, and the probability of the occurrence of such hazard;
- (b) the number of persons whose health or safety might be affected by the hazard;
- (c) the management systems and staffing arrangements by which any hazard is to be or is controlled;
- (d) the safety systems, procedures and monitoring systems by which any hazard is to be or is controlled;
- (e) the qualifications, experience and training of staff concerned;
- (f) the design, construction, operation or maintenance of any equipment (including the incorporation of adequate safety or reliability features of such equipment) which is used for the purposes of intervention or which is used to control any hazard;
- (g) the design and operating documentation;
- (h) the design and operation of containment and pressure systems;
- (i) the protection of persons from the effects of loss of containment; and
- (j) the procedures for the reporting of and learning from radiation emergencies.

**INFORMATION TO BE INCLUDED IN EMERGENCY PLANS****PART I****Information to be included in an operator's emergency plan**

The information referred to in regulation 7(2) is as follows—

- (a) the names or positions of persons authorised to set emergency procedures in motion and the person in charge of and co-ordinating the on-site mitigatory action;
- (b) the name or position of the person with responsibility for liaison with the local authority responsible for preparing the off-site emergency plan;
- (c) for reasonably foreseeable conditions or events which could be significant in bringing about a radiation emergency, a description of the action which should be taken to control the conditions or events and to limit their consequences, including a description of the safety equipment and the resources available;
- (d) the arrangements for limiting the risks to persons on the premises including how warnings are to be given and the actions persons are expected to take on receipt of a warning;
- (e) the arrangements for providing early warning of the incident to the local authority responsible for setting the off-site emergency plan in motion, the type of information which should be contained in an initial warning and the arrangements for the provision of more detailed information as it becomes available;
- (f) the arrangements for providing assistance with off-site mitigatory action; and
- (g) the arrangements for emergency exposures including the dose levels which have been determined as appropriate for the purposes of putting into effect the emergency plan.

**PART II****Information to be included in a carrier's emergency plan**

The information referred to in regulation 8(2) is as follows—

- (a) the names or positions of persons authorised to set emergency procedures in motion and the person in charge of and co-ordinating the mitigatory action;
- (b) for reasonably foreseeable conditions or events which could be significant in bringing about a radiation emergency, a description of the action which should be taken to control the conditions or events and to limit their consequences, including a description of the safety equipment and the resources available;
- (c) the arrangements for providing early warning of the incident, the type of information which should be contained in an initial warning and the arrangements for the provision of more detailed information as it becomes available; and
- (d) the arrangements for emergency exposures including the dose levels which have been determined as appropriate for the purposes of putting into effect the emergency plan.

**PART III****Information to be included in an off-site emergency plan**

The information referred to in regulation 9(2) is as follows—

- (a) the names or positions of persons authorised to set emergency procedures in motion and of persons authorised to take charge of and co-ordinate the off-site mitigatory action;
- (b) the arrangements for receiving early warning of incidents, and alert and call-out procedures;
- (c) the arrangements for co-ordinating resources necessary to implement the off-site emergency plan;
- (d) the arrangements for providing assistance with on-site mitigatory action;
- (e) the arrangements for off-site mitigatory action;
- (f) the arrangements for providing the public with specific information relating to the emergency and the behaviour which it should adopt; and
- (g) the arrangements for emergency exposures including the dose levels which have been determined as appropriate for the purposes of putting into effect the emergency plan.

## **PRINCIPLES AND PURPOSES OF INTERVENTION**

### **PART I**

#### **Principles to which emergency plans shall have regard**

An emergency plan drawn up pursuant to regulation 7, 8 or 9 respectively shall, in so far as it applies to any radiation emergency, be drawn up having regard to the following principles—

- (a) the intervention shall be undertaken only if the reduction in the detriment due to the radiation resulting from the radiation emergency is sufficient to justify the harm and costs, including the social costs, of the intervention; and
- (b) the form, scale and duration of the intervention shall be carried out in such a way as to ensure that exposures to radiation are kept as low as is reasonably practicable so that the benefit of the reduction in health detriment less the detriment associated with the intervention will be maximised.

### **PART II**

#### **Purposes of intervention**

The purposes of intervention referred to in regulations 7(5), 8(6) and regulation 9(11) are—

- (a) reducing or stopping at source direct radiation and the emission of radionuclides;
- (b) reducing the transfer of radioactive substances to individuals from the environment; and
- (c) reducing the exposure and organising the treatment of persons who have been subject to exposure to radiation.



**PRIOR INFORMATION TO BE SUPPLIED AND  
MADE PUBLICLY AVAILABLE**

1. Basic facts about radioactivity and its effects on persons and on the environment.
2. The various types of radiation emergency covered and their consequences for the general public and the environment.
3. Emergency measures envisaged to alert, protect and assist the general public in the event of a radiation emergency.
4. Appropriate information on action to be taken by the general public in the event of a radiation emergency.
5. The authority or authorities responsible for implementing the emergency measures and action referred to in paragraphs 3 and 4 above.

**INFORMATION TO BE SUPPLIED IN THE EVENT  
OF A RADIATION EMERGENCY**

1. Information on the type of emergency which has occurred, and, where possible, its characteristics, for example, its origin, extent and probable development.
2. Advice on health protection measures, which, depending on the type of emergency, might include—
  - (a) any restrictions on the consumption of certain foodstuffs and water supply likely to be contaminated;
  - (b) any basic rules on hygiene and decontamination;
  - (c) any recommendation to stay indoors;
  - (d) the distribution and use of protective substances;
  - (e) any evacuation arrangements;
  - (f) special warnings for certain population groups.
3. Any announcements recommending co-operation with instructions or requests by the competent authorities.
4. Where an occurrence which is likely to give rise to a release of radioactivity or ionising radiation has happened but no release has yet taken place, the information and advice should include the following—
  - (a) an invitation to tune in to radio or television;
  - (b) preparatory advice to establishments with particular collective responsibilities; and
  - (c) recommendations to occupational groups particularly affected.
5. If time permits, information setting out the basic facts about radioactivity and its effects on persons and on the environment.

## AMENDMENT OF REGULATIONS

*The Fire Certificates (Special Premises) Regulations 1976*

1. Paragraph 14 of Schedule 1 to the Fire Certificates (Special Premises) Regulations 1976(a) shall be deleted and the following substituted—

“14. Premises to which the Radiation (Emergency Preparedness and Public Information) Regulations 2001 apply by virtue of regulation 3 of those Regulations.”.

*The Ionising Radiations Regulations 1999*

2. The 1999 Regulations shall be amended in accordance with paragraphs 3 to 9.

3. In regulation 21(3)(i), the word “to” shall be inserted before “maintain”.

4. In regulation 35(1), after the words “these Regulations” there shall be inserted the words “or of the Radiation (Emergency Preparedness and Public Information) Regulations 2001.”.

5. After regulation 35, there shall be inserted the following regulation—

**“Enforcement**

**35A.** Insofar as any provision of regulation 21 is made under section 2(2) of the European Communities Act 1972, sections—

(a) 16 to 21 (approval of codes of practice and enforcement);

(b) 23 (provisions supplementary to sections 21 and 22) and 24 (appeal against improvement or prohibition notice), so far as they relate to an improvement notice;

(c) 26 (power to indemnify inspectors); and

(d) 33 to 42 (provisions as to offences),

of the Health and Safety at Work etc. Act 1974 shall apply to that provision as if that provision had been made under section 15 of that Act.”

6. Paragraph (7) of regulation 36 shall be deleted and the following substituted—

“(7) Where a contravention of these Regulations by any person is due to the act or default of some other person, that other person shall be guilty of the offence which would, but for any defence under this regulation available to the first-mentioned person, be constituted by the act or default.”.

7. In paragraph 6 of Schedule 4, after “trainee” there shall be inserted the words “referred to in paragraphs 1 or 3”.

8. In paragraph 19 of Schedule 4, in place of “pursuant to regulation 11(2)” there shall be substituted “in accordance with regulation 11(1)”.

9. In column 1 of Schedule 8, under the entry for Ruthenium, in place of “Ru-160 +”, there shall be substituted “Ru-106 +”.

*The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995*

10. In Schedule 7 of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995(b)—

(a) “The Ionising Radiations Regulations 1985” shall be deleted and “The Ionising Radiations Regulations 1999” substituted; and

(b) after the final entry there shall be added: “The Radiation (Emergency Preparedness and Public Information) Regulations 2001.”.

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(a) S.I. 1976/2003; the only relevant amending instrument is S.I. 1985/1333.  
(b) S.I.1995/3163.

## EXPLANATORY NOTE

*(This note is not part of the Regulations)*

The Regulations implement as respects Great Britain Title IX, Section 1 (Intervention in cases of radiological emergency) of Council Directive 96/29/Euratom (OJ No. L159, 29.6.96, p.1) laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation and impose requirements for that purpose on operators of premises where radioactive substances are present (in quantities exceeding specified thresholds). They also impose requirements on carriers transporting radioactive substances (in quantities exceeding specified thresholds) by rail or conveying them through public places, with the exception of carriers conveying radioactive substances by rail, road, inland waterway, sea or air or by means of a pipeline or similar means.

The competent authority for the purposes of the Regulations is the Health and Safety Executive (“the Executive”).

The Regulations—

- (a) impose a duty on the operator and carrier to make an assessment as to hazard identification and risk evaluation and, where the assessment reveals a radiation risk, to take all reasonably practicable steps to prevent a radiation accident or limit the consequences should such an accident occur (regulation 4);
- (b) impose a duty on the operator and carrier to send the Executive a report of an assessment containing specified matters at specified times and empower the Executive to require a detailed assessment of such further particulars as it may reasonably require (regulation 6 and Schedules 5 and 6);
- (c) impose a duty on the operator and carrier to make a further assessment following a major change to the work with ionising radiation or within 3 years of the date of the last assessment, unless there has been no change of circumstances which would affect the last report of the assessment, and send the Executive a report of that further assessment (regulations 5 and 6);
- (d) where an assessment reveals a reasonably foreseeable radiation emergency arising, impose a duty on the operator or carrier (as the case may be) and, in the case of an operator, the local authority in whose area the premises in question are situated, to prepare emergency plans (regulations 7, 8 and 9 and Schedules 7 and 8);
- (e) require operators, carriers and local authorities to review, revise and test emergency plans at suitable intervals not exceeding 3 years (regulation 10);
- (f) make provision as to consultation and co-operation by operators, carriers, employers and local authorities (regulation 11);
- (g) make provision as to charging by local authorities for performing their functions under the Regulations in relation to emergency plans (regulation 12);
- (h) in the event of the occurrence of a radiation emergency or of an event which could reasonably be expected to lead to such an emergency, make provision as to the implementation of emergency plans, and, in the event of the occurrence of a radiation emergency, the making of both provisional and final assessments as to the circumstances and consequences of the emergency (regulation 13);
- (i) where an emergency plan provides for the possibility of an employee receiving an emergency exposure, impose a duty on the employer to undertake specified arrangements for employees who may be subject to exposures, such as dose assessments, medical surveillance and the determination of appropriate dose levels, and impose further duties on employers in the event that an emergency plan is implemented (regulation 14);
- (j) impose requirements on operators and carriers, where an operator or carrier carries out work with ionising radiation which could give rise to a reasonably foreseeable radiation emergency, and on local authorities, where there has been a radiation emergency in their area, to supply specified information to the public (regulations 16 and 17 and Schedules 9 and 10);
- (k) empower the Secretary of State for Defence to issue certificates of exemption to persons from specified classes in the interests of national security (regulation 18);
- (l) make certain amendments to the Fire Certificates (Special Premises) Regulations 1976, the Ionising Radiations Regulations 1985, the Reporting of Injuries, Diseases

and Dangerous Occurrences Regulations 1995 and the Ionising Radiations Regulations 1999 and, subject to savings, revoke the Public Information for Radiation Emergencies Regulations 1992 (regulations 21 and 22); and  
(m) contain transitional provisions (regulation 20).

A copy of the regulatory impact assessment prepared in respect of these Regulations can be obtained from the Health and Safety Executive, Economic Adviser's Unit, Rose Court, 2 Southwark Bridge, London SE1 9HS. A copy has been placed in the library of each House of Parliament.

**2001 No. 2975**

**HEALTH AND SAFETY**

**The Radiation (Emergency Preparedness and  
Public Information) Regulations 2001**