

# Health Protection (Ionising Radiation)

**1995-09**

## **RADIATION (EMERGENCY PREPAREDNESS AND PUBLIC INFORMATION) REGULATIONS 2004**

**Subsidiary  
2004/087**

*This version is out of date*

Regulations made under s. 2 of the Health Protection (Ionising Radiation)  
Act 1995, s. 23 of the Interpretation and General Clauses Act.

## **RADIATION (EMERGENCY PREPAREDNESS AND PUBLIC INFORMATION) REGULATIONS 2004**

**(LN. 2004/087)**

*Commencement*      **13.9.2004**

Amending enactments	Relevant current provisions	Commencement date
LN. 2006/048	rr. 2, 10(3), (4) & (5), 12(1), (1)(a), (2) & (3), 13(2), (3)(a)(iii), 15, 16(3), 17(1) & (3), 24(1), 28(1) & Sch.7	13.4.2006
Act. 2016-20	r. 22(2)	13.10.2016

**Implementing:**  
Directive 96/29/EURATOM

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*In exercise of the powers conferred upon it by section 2 of the Health Protection (Ionising Radiation) Act 1995, section 23 of the Interpretation and General Clauses Act and of all other enabling powers, and for the purpose of implementing in the law of Gibraltar Council Directive 96/29/EURATOM, the Government has made the following Regulations-*

**PART I**

**PRELIMINARY**

**Title and commencement.**

1. These Regulations may be cited as the Radiation (Emergency Preparedness and Public Information) Regulations 2004 and come into operation on 13 September 2004.

**Definitions.**

2.(1) In these Regulations, unless the context otherwise requires-

"the 2004 Regulations" means the Ionising Radiation Regulations 2004;

"the IAEA Regulations" means the International Atomic Energy Agency Regulations for the Safe Transport of Radioactive Materials 1996;

"approved dosimetry service" means an approved dosimetry service within the meaning of the 2004 Regulations and which is approved for the purpose of regulation 14 of these Regulations;

"carrier" means an employer undertaking the transport of any radioactive material, except where such material is itself integral to the means of transport, and includes both a carrier for hire or reward and a carrier on own account;

"carrier's emergency plan" shall be construed in accordance with regulation 8;

"competent authority" means the person appointed by notice in the Gazette by the Chief Minister for the purposes of these Regulations;

"consignor" means an employer carrying out work with ionising radiation who presents a consignment of any radioactive substance to a carrier for transport;

"conveyance" means-

- (a) in relation to transport by road, any vehicle;
- (b) in relation to transport by sea, any vessel, hold, compartment or defined deck area of a vessel;
- (c) in relation to transport by air, any aircraft;

“defined deck area” means the area of the weather deck of a vessel or the vehicle deck of a ship or ferry, which area is allocated for the stowage of any radioactive substance;

“dose assessment” means the dose assessment made and recorded by an approved dosimetry service in accordance with regulation 22 (dose assessment and recording) of the 2004 Regulations;

"dose record" means the record made and maintained in respect of an employee by the approved dosimetry service in accordance with regulation 22 (dose assessment and recording) of the 2004 Regulations;

"emergency exposure" means an exposure of an employee engaged in, or associated with the response to, a radiation emergency or a potential radiation emergency, for the purposes of-

- (a) helping endangered persons;
- (b) preventing the exposure of a large number of persons; or
- (c) saving any valuable installation or goods,

whereby one of the individual does limits referred to in paragraphs 1 or 2 of Part I of Schedule 4 to the 2004 Regulations could be exceeded;

"emergency services" means-

- (a) those ambulance, fire and police services who are likely to be required to respond to a radiation emergency;
- (b) where appropriate, the Captain of the Port;

"Health Authority" means the Gibraltar Health Authority;

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

- (a) equipment, structures, pipe-work, machinery and tools;
- (b) any docks and unloading quays serving the unit; and
- (c) any 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 ionising 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;

"medical surveillance" means medical surveillance carried out in accordance with regulation 25 (medical surveillance) of the 2004 Regulations;

"member of the public" means any person other than-

- (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, or associated with the response to, a radiation emergency;

"the Minister" means the Minister with responsibility for Transport;

"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;

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

“operator” shall be construed in accordance with subregulation (2);

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

“practice” means work involving-

- (a) the production, processing, handling, use holding, storage, transport or disposal of radioactive substances; or
- (b) the operation of any electrical equipment emitting ionising radiation and containing components operating at a potential difference of more than 5 kV,

which can increase the exposure of individuals 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;

“premises” means the whole area under the control of the same person where radioactive substances are present in one or more installations and for this purpose –

- (a) two or more areas under the control of the same person and separated only by a road shall be treated as one whole area: and
- (b) where 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 premises under the control of the Secretary of State for Defence;

"radiation accident" means an unplanned and unintended event 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 unplanned and unintended event which is likely to result in any member of the public being exposed to ionising radiation in excess of any of the doses set out in Schedule 1; and, for this purpose, the impact of any health protection measure, to be taken during the 24 hours immediately following the

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event, upon the dose of ionising radiation which is likely to be received by that member of the public shall be disregarded; and, for the avoidance of doubt, does not include any situation leading to lasting exposure to ionising radiation resulting either from the after-effects of a radiological emergency, as defined, or from a past practice;

"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 carriage of a radioactive substance by road (within the meaning of section 2(1) of the Traffic Act) or through another public place (whether on a conveyance or not), or by sea or air, and in the case of transport on a conveyance, a radioactive substance shall be deemed as being transported from the time that it is loaded onto the conveyance for the purpose of transporting it until it is unloaded from that conveyance, but a radioactive substance shall not be considered as being transported if it is carried by means of a pipeline or similar means;

"vessel" means any sea-going vessel;

"vehicle" means any road vehicle (including an articulated vehicle and for the purposes of these Regulations each trailer 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 or disposal of any radioactive substance which can increase the exposure of persons to radiation from an artificial source, or from a radioactive substance containing naturally occurring radionuclides which is processed for its radioactive, fissile or fertile properties.

(2) In these Regulations, any reference to an operator is a reference to that person who is, in the course of a trade, business or undertaking carried on by him, in control of the operation of premises on which work with ionising radiation is carried on and any duty imposed by these Regulations on the operator shall apply only in relation to those premises.



(3) 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.

(4) Any reference in these Regulations to-

- (a) a numbered regulation or Schedule is a reference to the regulation or Schedule so numbered in these Regulations;
- (b) a numbered subregulation is a reference to the subregulation so numbered in the regulation in which that reference appears; and
- (c) a numbered paragraph is a reference to the paragraph so numbered in the subregulation or Schedule in which that reference appears.

## **Application.**

3.(1) Subject to subregulation (4), these Regulations shall 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 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 paragraph (b) through any public place-
  - (i) otherwise than by road, sea or air; or

(ii) by means of a pipeline or similar means.

(2) For the purposes of subregulation (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 subregulation (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) any non-dispersible source, except for the transport of such source;
- (b) any radioactive substance which has an activity concentration of not more than 100 Bqg<sup>-1</sup>, except for the transport of such substance;
- (c) any radioactive substance which is present in a live body or in the corpse of an animal or a human being, except where such presence is as a consequence of a radiation emergency;
- (d) any radioactive substance which conforms to the specifications for special form radioactive material set out in IAEA Regulations and which is certified pursuant to those Regulations as complying with them;
- (e) any radioactive substance which is in a package which complies in every respect with either the requirements for-

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- (i) a Type B package design within the meaning of the IAEA Regulations; or
- (ii) a consignment shipped under Special Arrangement Transport Operations within the meaning of the IAEA Regulations,  
  
and which is, in either case, certified pursuant to those Regulations as complying with them;
- (f) 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 IAEA Regulations;
- (g) 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 IAEA Regulations.

## PART II

### HAZARD IDENTIFICATION AND EMERGENCY PLANS

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

4.(1) In relation to work with ionising radiation to which these Regulations apply-

- (a) every operator shall make an assessment before such work is carried out at the premises for the first time;
- (b) every carrier shall ensure that an assessment has been made before undertaking the transport of any radioactive substance for the first time,

which assessment, 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 subregulation (1) or of regulation 5 shows there is a risk of exposure of employees or other persons to ionising radiation resulting from an identifiable radiation accident, the operator or carrier, as the case may be, shall take all reasonably practicable steps to-

- (a) prevent the occurrence of 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 7 (Risk assessment) of the Factories (Management of Health and Safety at Work) Regulations 1996 and to regulation 7 (Prior risk assessment etc.) of the Ionising Radiation Regulations 2004.

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

5.(1) Where a material change occurs in the work with ionising radiation in respect of which an assessment has been made pursuant to regulation 4(1)-

- (a) the operator shall make a further assessment to take account of that change;
- (b) the carrier shall ensure that a further assessment is made to take account of that change.

(2) Subject to subregulation (3), until such time as the work in respect of which an assessment has been made pursuant to regulation 4(1) ceases, the operator and the carrier shall make (or, in the case of a carrier, ensure there is made) a further assessment, within three years of the date of the last assessment (whether made pursuant to subregulation (1) of regulation 4 or subregulation (1) of this regulation).

(3) A further assessment pursuant to subregulation (2) shall not be required if there have been no changes to the work in the interim which would affect the last report submitted to the competent authority in accordance with regulation 6, in which case, the operator or carrier concerned shall sign a declaration to that effect.

**Reports of assessment.**

6.(1) Where an assessment has been made pursuant to regulation 4(1) the operator or carrier concerned shall send to the competent authority 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 competent authority may agree.

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

(3) Where an assessment has been made pursuant to regulation 5(2), the operator or carrier concerned shall send to the competent authority a report of that assessment within 28 days of the assessment being made.

(4) Where a declaration has been signed pursuant to regulation 5(3), the operator or carrier concerned shall send that declaration to the competent authority within 28 days of it being signed.

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

(6) 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 competent authority reasonably requires a detailed assessment of any of the matters set out in Schedule 6, it may serve on the operator or carrier concerned a notice in writing requiring him to carry out (or, in the case of a carrier, ensure there is 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 competent authority, within such time as is specified in the notice or within such longer time as the competent authority may subsequently agree.

(7) The competent authority shall not require a detailed assessment of any of the matters set out in Schedule 6(a), (d), (f), (g) and (h) where the information requested is in connection with activities on board or related to a Nuclear Powered Warship and where the information related to such activities has been submitted to the appropriate authority in the United Kingdom (the Health and Safety Executive) for the purposes equivalent to those set out in this regulation, and the said appropriate authority in the United Kingdom has accepted that this information is sufficient for those purposes.

## **Operator's emergency plan.**

7.(1) Where the assessment made by an operator pursuant to regulation 4(1) or regulation 5 shows that it is reasonably foreseeable that a radiation emergency might occur (having regard to the steps taken by the operator

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under regulation 4(2)), the operator concerned 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 any such emergency.

(2) Where an operator is required to prepare an operator's emergency plan pursuant to subregulation (1) he shall not carry out for the first time any work with ionising radiation to which that plan relates unless such a plan has been prepared in accordance with the requirements of this regulation.

(3) Without prejudice to the generality of subregulation (1), the operator's emergency plan shall-

- (a) contain the information specified in Part I of Schedule 7;
- (b) be drawn up having regard to the principles set out in Part I of Schedule 8; and
- (c) secure intervention, where appropriate, for the purposes set out in Part II of Schedule 8.

(4) For the purpose of preparing the operator's emergency plan pursuant to subregulation (1) or of reviewing the plan pursuant to regulation 10(1), the operator shall consult-

- (a) his employees;
- (b) any person carrying out work on his behalf;
- (c) the competent authority;
- (d) the emergency services;
- (e) the Environmental Agency;
- (f) the Health Authority; and
- (g) such other persons, bodies and authorities (or in each case representatives thereof) as he 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.

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

(6) The operator shall ensure that any employee under his control 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, 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 23 (dose assessment and recording) of the Ionising Radiation Regulations 2004).

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

8.(1) Where the assessment made in relation to the transport of a radioactive substance pursuant to regulation 4(1) or regulation 5 shows that it is reasonably foreseeable that a radiation emergency might occur (having regard to the steps taken by the carrier pursuant to regulation 4(2)), the carrier concerned shall ensure that an adequate emergency plan is prepared 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 any such emergency.

(2) Where a carrier is required to ensure that a carrier's emergency plan is prepared pursuant to subregulation (1), he shall not undertake the transport of any radioactive substance to which that plan relates unless such plan has been prepared in accordance with the requirements of this regulation.

(3) Without prejudice to the generality of subregulation (1), the carrier's emergency plan shall-

- (a) contain the information specified in Part II of Schedule 7;
- (b) be drawn up having regard to the principles set out in Part I of Schedule 8; and

- (c) secure intervention, where appropriate, for the purposes set out in Part II of Schedule 8.

(4) Where the consignor of any radioactive substance is not also the carrier, he shall supply to the carrier, before presenting the consignment of such substance for transport, such information as is necessary for the purpose of enabling the carrier to ensure there is prepared the carrier's emergency plan pursuant to subregulation (1).

(5) For the purpose of ensuring that a carrier's emergency plan is prepared pursuant to subregulation (1) or of ensuring that such plan is reviewed pursuant to regulation 10(1), the carrier shall consult-

- (a) the consignor (where he is not also the carrier);
- (b) the competent authority;
- (c) the emergency services;
- (d) the Environmental Agency;
- (e) the Health Authority;
- (f) the Minister; and
- (g) such other persons, bodies or authorities (or in each case representatives thereof) as he considers appropriate.

(6) The carrier shall provide to the competent authority upon request and within such reasonable time as the competent authority may specify, a copy of the carrier's emergency plan or such parts of the plan as the competent authority may require.

(7) 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 23 (dose assessment and recording) of the Ionising Radiation Regulations 2004).

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

9.(1) Where the assessment made by any operator pursuant to regulation 4(1) or regulation 5 shows that it is reasonably foreseeable that a radiation emergency might occur (having regard to the steps taken by the operator pursuant to regulation 4(2)) the Environmental Agency 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 any such emergency.

(2) Without prejudice to the generality of subregulation (1), the off-site emergency plan shall-

- (a) address each reasonably foreseeable radiation emergency identified by each operator;
- (b) cover such area as, in the opinion of the competent authority, is appropriate (having regard to those members of the public who are likely to be affected by any such emergency);
- (c) contain the information specified in Part III of Schedule 7;
- (d) be drawn up having regard to the principles set out in Part I of Schedule 8; and
- (e) secure intervention, where appropriate, for the purposes set out in Part II of Schedule 8.

(3) For the purpose of preparing an off-site emergency plan pursuant to subregulation (1) or of reviewing the plan pursuant to regulation 10(1), the Environmental Agency shall consult-

- (a) all operators carrying out the work with ionising radiation to which the plan relates;
- (b) the competent authority;
- (c) the emergency services;
- (d) the Health Authority; and

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- (e) such other persons, bodies and authorities (or in each case representatives thereof) and members of the public as the Environmental Agency considers appropriate.

(4) The off-site emergency plan shall be prepared no later than 6 months (or such longer period, not exceeding 9 months, as the competent authority may agree in writing) after whichever is the later of-

- (a) the receipt by the Environmental Agency of a notice from the competent authority informing the Environmental Agency of the need to prepare an off-site emergency plan; or
- (b) the receipt by the Environmental Agency of the information referred to in subregulation (7) or (8)(a).

(5) The Environmental Agency shall provide to the competent authority, upon request and within such reasonable time as may be specified, a copy of the off-site emergency plan or such parts of the plan as the competent authority may require.

(6) The employer of any employee who may be required to participate in the implementation of an off-site emergency plan shall ensure that such employee 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.

(7) Where the Environmental Agency is required to prepare an off-site emergency plan pursuant to subregulation (1) by virtue of the fact that an assessment made by an operator pursuant to regulation 4(1) or regulation 5, shows that it is reasonably foreseeable that a radiation emergency might occur, that operator shall not carry out for the first time any work with ionising radiation which might give rise to any such emergency unless he has provided the Environmental Agency with such information as is necessary for the purpose of enabling it to prepare those parts of the off-site emergency plan which relates to that work.

(8) Without prejudice to subregulation (7), the operator shall further provide the Environmental Agency with-

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- (a) any additional information which the Environmental Agency may reasonably request to enable it to prepare the off-site emergency plan; and
- (b) details of any material change to the information provided under subregulation (7) resulting from-
  - (i) any further assessment made pursuant to regulation 5; or
  - (ii) a revision of the operator's emergency plan pursuant to regulation 10(1),

within 28 days of any such further assessment or revision.

- (9) The operator shall-
  - (a) review and, where necessary, revise the information provided to the Environmental Agency pursuant to subregulations (7) or (8)(a), at suitable intervals (not exceeding 3 years from the date upon which information was last provided to the Environment Agency under those subregulations); and
  - (b) notify the Environmental Agency of the outcome of that review, within 28 days of completing it.

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

10.(1) Where an emergency plan has been prepared pursuant to-

- (a) regulation 7, the operator concerned shall review and, where necessary, revise the plan;
- (b) regulation 8, the carrier concerned shall ensure that the plan is reviewed and, where necessary, revised;
- (c) regulation 9, the Environmental Agency shall review and, where necessary, revise the plan,

at suitable intervals, not exceeding 3 years.

- (2) The review referred to in subregulation (1) shall take into account-
  - (a) any changes occurring in the work with ionising radiation to which the plan relates;

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- (b) any changes within the emergency services;
- (c) any new and relevant technical information;
- (d) any new information concerning the response to radiation emergencies; and
- (e) any material change to the assessment on which the emergency plan was based since the plan was last reviewed or revised.

(3) Where an emergency plan has been prepared pursuant to regulation 7, 8 or 9, the operator or carrier concerned, or the Government's Civil Contingency Committee, whichever is the case, shall-

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

at suitable intervals, not exceeding 3 years.

(4) The carrier shall endeavour to reach agreement with the emergency services and the Government's Civil Contingency Committee as to how the carrier's emergency plan is to be tested.

(5) The Government's Civil Contingency Committee shall endeavour to reach agreement with the emergency services and each operator who is required to prepare an operator's emergency plan as to how the off-site emergency plan is to be tested in relation to the radiation emergencies identified by that operator.

**Consultation and co-operation.**

11.(1) The operator shall consult any other employer who carries out work with ionising radiation on the premises and shall take account of any relevant matters arising from such consultation, for the purpose of complying with the duties imposed upon the operator by regulations 4(1)(a), 4(2), 5 and 7.

(2) Any employer who carries out work with ionising radiation at premises in relation to which these Regulations apply shall co-operate with the operator of those premises, by providing him with 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 to do so depends upon such co-operation.

(3) Any person who is required to prepare (or ensure that there is prepared) an emergency plan, pursuant to regulation 7, 8 or 9, 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 do so depends upon such co-operation.

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

12.(1) The Environmental Agency and the Government's Civil Contingency Committee may charge-

- (a) the operator a fee for performing the Environmental Agency's functions in relation to the off-site emergency plan under regulation 9 and 10 and the Government's Civil Contingency Committee's functions in relation to the off-site emergency plan under regulation 10; and
- (b) the carrier a fee for performing the Environmental Agency's functions in relation to the carrier's emergency plan under regulation 10(1)(b).

(2) The fee charged under subregulation (1) shall not exceed the sum of costs reasonably incurred by the Environmental Agency or the Government's Civil Contingency Committee in performing the functions referred to in that subregulation, including (but without prejudice to the generality of the foregoing provision of this subregulation) any costs reasonably incurred by the Government's Civil Contingency Committee 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 Environmental Agency or the Government's Civil Contingency Committee 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) Where an emergency plan has been prepared pursuant to regulation 7 or 8, the operator or carrier concerned shall take all 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 the competent authority without delay of that occurrence.

(2) Where an emergency plan has been prepared pursuant regulation 9, the Government's Civil Contingency Committee shall take all reasonable steps to put it, or such parts of it as are necessary, 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 shall make or the carrier shall ensure there is made (whichever is the case)-

- (a) as soon as is practicable, a provisional assessment of the circumstances and consequences of such an emergency and for this purpose shall consult-
  - (i) in the case of a carrier, the consignor (where he is not also the carrier),
  - (ii) the emergency services,
  - (iii) The Government's Civil Contingency Committee,
  - (iv) the Health Authority; and
  - (v) such other persons, bodies or authorities as have functions under the operator's emergency plan, the off-site emergency plan or, in the case of a carrier, the carriers' emergency plan;

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- (b) as soon as is practicable and in any event within 12 months or such longer time as the competent authority may agree, 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 paragraph (b), a report of the findings of the assessment.
- (4) The operator or carrier, whichever is the case, shall-
- (a) provide a copy of the report made pursuant to subregulation (3)(c) to the competent authority within 28 days of its completion; and
  - (b) retain the original report, or a copy thereof, for at least 50 years from the date upon which the report was completed.

## **Emergency exposures.**

14.(1) Where an emergency plan prepared pursuant to regulation 7, 8 or 9 provides for any employee to undergo an emergency exposure, each employer, in relation to his own employees, shall-

- (a) identify those employees who may be subject to emergency exposures and provide them with-
  - (i) appropriate training in the field of radiation protection;
  - (ii) 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; and
  - (iii) such equipment as is necessary to restrict their exposure to radiation;
- (b) make arrangements with an appointed doctor for that doctor to carry out medical surveillance, without delay, on those employees who undergo emergency exposures, in the event of a radiation emergency;
- (c) make arrangements with an approved dosimetry service for that service to-

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- (i) make an assessment, without delay, of the doses of ionising radiation received by those employees who undergo emergency exposures; and
- (ii) notify, without delay, the employer and the competent authority of the results of the dose assessments made under subparagraph (i) above;
- (d) identify and provide with appropriate training those employees who shall be authorised, in the event of a radiation emergency, to permit any of the employees referred to in paragraph (a) to be subject to an emergency exposure;
- (e) make arrangements to notify, without delay, the appointed doctor (with whom he has made arrangements to carry out medical surveillance on those employees who undergo emergency exposures pursuant to paragraph (b)) of the results of any dose assessments made and notified to the employer under arrangements made pursuant to paragraph (c).

(2) At least 28 days (or within such shorter time as the competent authority may agree) prior to carrying out work with ionising radiation or to transporting any radioactive substance for the first time, the operator or carrier, whichever is the case, shall notify to the competent authority the dose levels which he has determined are appropriate to be applied in respect of those employees identified for the purposes of subregulation (1)(a), in the event of a radiation emergency.

(3) Where an operator or carrier decides that a dose level that he has determined pursuant to subregulation (2) is no longer appropriate to be applied in respect of an employee identified for the purposes of subregulation (1)(a), in the event of a radiation emergency, he shall notify to the competent authority the dose level which he considers is appropriate to be applied to that employee in such circumstances, at least 28 days (or within such shorter time as the competent authority may agree) prior to formally determining the revised dose level.

(4) In any case where, in the opinion of the competent authority, any dose level for an emergency exposure notified pursuant to subregulation (2) or (3) is too high, the competent authority may direct the operator or carrier, as the case may be, to substitute such lower dose level as the competent authority may consider appropriate.



(5) Where an emergency plan is put into effect pursuant to the provisions of regulation 13, each employer shall ensure that, in relation to his own employees-

- (a) no employee or trainee under 18 years of age and no female employee who is pregnant or breastfeeding is subject to an emergency exposure;
- (b) no other employee is subject to an emergency exposure unless-
  - (i) that employee has agreed to undergo such exposure;
  - (ii) the requirements of subregulation (1)(a), (b), (c) and (e) have been complied with in respect of that employee; and
  - (iii) that employee has been permitted to be subject to such exposure by an employee authorised under subregulation (1)(d) to give such permission; and
- (c) that no employee involved in implementing an emergency plan is exposed to a dose of radiation in excess of-
  - (i) the dose level determined pursuant to subregulation (2);
  - (ii) the revised dose level determined pursuant to subregulation (3); or
  - (iii) the substituted dose level determined pursuant to subregulation (4),

as the case may be.

(6) The duty imposed upon the employer by subregulation (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 subregulation (5)(c) shall not apply in respect of any person who-

- (a) having been informed about the risks involved in the intervention, agrees to undergo an exposure greater than any dose level referred to in that paragraph, for the purpose of saving human life; and

- (b) has been given permission to be subject to such exposure by an employee authorised under subregulation (1)(d) to give such permission.

(8) Where an employee has undergone an emergency exposure, the employer shall ensure that-

- (a) the dose of ionising radiation received by that employee is assessed by an approved dosimetry service; and
- (b) such dose assessment 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 subregulation.

(9) Where a dose record has been created for the purpose of subregulation (8)(b), the employer shall obtain and make available to the employee concerned a copy of that record, upon request and upon reasonable notice being given.

(10) Where a report made pursuant to regulation 13(3)(c), contains details of 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 a period of at least 50 years from the termination of the work which involved the emergency exposure.

(11) The requirements of this regulation shall not have effect in relation to members of Her Majesty's Forces to the extent that they would in the opinion of the Secretary of State for Defence be against the interests of the security of the United Kingdom or Gibraltar.

**Disapplication of dose limits.**

15. In the event of a radiation emergency, regulation 12 (dose limitation) of the 2004 Regulations shall not apply to intervention.

**Prior information to be supplied to members of the public and to be made publicly available.**

16.(1) An operator or carrier who carries out work with ionising radiation in relation to 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 competent authority, they are likely to be

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affected by a radiation emergency arising from the undertaking of that operator or carrier, as the case may be, are supplied with at least the information specified in Schedule 9-

- (i) in an appropriate manner; and
  - (ii) without their having to request it; and
- (b) make the information referred to in paragraph (a) publicly available.

(2) In preparing the information to be supplied in accordance with subregulation (1), the operator or carrier shall consult-

- (a) the Environmental Agency,
- (b) any authority likely to fall within paragraph 5 of Schedule 9; and
- (c) 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 subregulation (1), the operator or carrier shall endeavour to enter into an agreement with the Competent Authority for it to disseminate the information referred to in that subregulation to the members of the public referred to in it.

(4) The operator or carrier shall review and, where necessary, revise the information referred to in subregulation (1)-

- (a) at regular intervals, not exceeding three years; and
- (b) whenever significant changes to the emergency measures, actions 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 subregulation (1) is supplied in accordance with that subregulation within a reasonable period of time after the off-site emergency plan or the carrier's emergency plan, as the case may be, has been prepared and that the information is so supplied again and made publicly available-

- (a) at regular intervals, not exceeding three years; and

(b) if it is revised pursuant to subregulation (4).

(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 that report available to the public as soon as is reasonably practicable after the report has been sent to the competent authority, pursuant to regulation 6 (except that, with the approval of the competent authority, the operator or carrier may withhold any part of the report the release of which would be likely to compromise industrial, commercial or personal confidentiality, public security or national defence).

**Information to be supplied to members of the public in the event of a radiation emergency.**

17.(1) The Government's Civil Contingency Committee shall prepare and keep up to date arrangements to supply, in the event of a radiation emergency, information and advice on-

- (a) the facts of the emergency,
- (b) the steps to be taken by the various authorities and others; and
- (c) where appropriate, the health protection measures to be taken.

(2) The arrangements referred to in subregulation (1) shall provide for the information and advice to be supplied to those members of the public who are actually affected by the emergency-

- (a) at regular intervals;
- (b) in an appropriate manner;
- (c) without delay, and
- (d) without their having to request it.

(3) In preparing and keeping up to date the arrangements referred to in subregulation (1), the Government's Civil Contingency Committee 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 the arrangements referred to in subregulation (1) shall, if relevant to the type of radiation emergency, include that specified in Schedule 10 and, in any event, shall mention the authority or authorities responsible for implementing the relevant measures referred to in that Schedule.

(5) For the purposes of subregulation (2), the members of the public actually affected by the emergency shall be those members of the public whose co-operation is sought in order to ensure that the mitigating steps and health protection measures referred to in subregulation (1) are taken.

## **PART III**

### **ENFORCEMENT AND MISCELLANEOUS PROVISIONS**

#### **Appointment and powers of inspectors.**

18.(1) The competent authority may appoint as inspectors (under whatever title it may from time to time determine) such persons having suitable qualifications as it thinks necessary for the purpose of enforcing these Regulations.

(2) Every appointment of a person as an inspector under this regulation shall be made by an instrument in writing, specifying which of the powers conferred on inspectors by these Regulations are to be exercisable by that person, which powers may be varied at any time by the competent authority by a further instrument in writing and an inspector shall be entitled to exercise only those powers which are so specified.

(3) When exercising or seeking to exercise any of the powers specified in his instrument of appointment, an inspector shall produce such instrument or a duly authenticated copy thereof, if so required.

(4) Subject to subregulation (7), an inspector may-

- (a) at any reasonable time (or, in a situation which in his opinion is or may be dangerous, at any time) enter any premises in which any person is carrying on or proposes to carry on, any activity falling within these Regulations, for the purpose of ascertaining whether any such person, premises and equipment on such premises complies with these Regulations;
- (b) make such examination and investigation as may be necessary for the purpose mentioned in paragraph (a);

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- (c) require any person whom he has reasonable cause to believe to be able to give any information relevant to any examination or investigation carried out under paragraph (b) to answer (in the absence of persons other than a person nominated by him to be present and any person whom the inspector may allow to be present) such questions as the inspector thinks fit to ask and to sign a declaration of the truth of his answers;
  - (d) require the production of, inspect and take copies of or of any entry in-
    - (i) any books or documents which by virtue of any of these Regulations are required to be kept; and
    - (ii) any other books or documents which it is necessary for him to see for the purposes of any examination or investigation under paragraph (b);
  - (e) require any person to afford him such facilities and assistance with respect to any matter or things within that person's control or in relation to which that person has responsibilities as are necessary to enable the inspector to exercise any of the powers conferred on him by this regulation;
  - (f) exercise any other power which is necessary for the purpose mentioned in paragraph (a).
- (5) Any information obtained by an inspector in exercise of his powers under these Regulations shall-
- (a) except as is necessary for the purpose of a disclosure to which paragraph (b)(iii) applies, have erased from it the name of any person who has received treatment, together with any details which might enable any such person to be identified;
  - (b) be used only for the purpose of giving effect to the obligations of the competent authority under these Regulations and shall not be disclosed to any other person except-
    - (i) in the prosecution of an offence under regulation 24;
    - (ii) to an expert or adviser engaged by the competent authority to provide to the authority information, analysis or advice for the purpose of enabling the authority to enforce these Regulations, and such person shall be

subject to the like obligation of confidentiality as by this regulation is imposed on the authority;

- (iii) to any person who by reason of having received treatment, in the opinion of the authority, should be so informed.

(6) For the purpose of this regulation, “received treatment” means having been-

- (a) the subject of the administration of a radioactive medicinal product; or
- (b) subject to a medical exposure,

to which these Regulations apply.

(7) Nothing in this regulation shall confer any power of entry to a nuclear powered warship, or access to information relating to nuclear-powered warships which in the opinion of the Secretary of State would raise issues of national security.

## **Improvement notices.**

19. If an inspector is of the opinion that a person-

- (a) is contravening one or more of these Regulations; or
- (b) has contravened one or more of those provisions in circumstances that make it likely that the contravention will continue to be repeated,

he may serve on him a notice (“an improvement notice”) stating that he is of that opinion, specifying the provision or provisions as to which he is of that opinion, giving particulars of the reasons why he is of that opinion, and requiring that person to remedy the contravention or, as the case may be, the matters occasioning it within such period (ending not earlier than the period within which an appeal against the notice can be brought under regulation 22) as may be specified in the notice.

## **Prohibition notices.**

20.(1) This regulation applies to any activities which are being or are likely to be carried on by or under the control of any person, being activities to or

in relation to which any of these Regulations apply or will, if the activities are so carried on, apply.

(2) If as regards any activities to which this regulation applies an inspector is of the opinion that, as carried on or likely to be carried on by or under the control of the person in question, the activities involve or, as the case may be, will involve a risk of serious personal injury, the inspector may serve on that person a notice (“a prohibition notice”).

(3) A prohibition notice shall-

- (a) state that the inspector is of that opinion;
- (b) specify the matters which in his opinion give or, as the case may be, will give rise to that risk;
- (c) where in his opinion any of those matters involves or, as the case may be, will involve a contravention of any of these Regulations, state that he is of that opinion, specify the provision or provisions as to which he is of that opinion, and give particulars of the reasons why he is of that opinion; and
- (d) direct that the activities to which the notice relates shall not be carried on by or under the control of the person on whom the notice is served unless the matters specified in the notice in pursuance of paragraph (b) and any associated contraventions of provisions so specified in pursuance of paragraph (c) have been remedied.

(4) A direction given in pursuance of subregulation (3)(d) shall take effect-

- (a) at the end of the period specified in the notice; or
- (b) immediately, if the notice so declares.

**Provisions supplementary to regulations 19 and 20.**

21.(1) In this regulation “a notice” means an improvement notice or a prohibition notice.

(2) Where a notice which is not to take immediate effect has been served-



- (a) the notice may be withdrawn by an inspector at any time before the end of the period specified therein in pursuance of regulation 19 or regulation 20(4), as the case may be; and
- (b) the period so specified may be extended or further extended by an inspector at any time when an appeal against the notice is not pending.

## **Appeal against improvement or prohibition notice.**

22.(1) In this regulation “a notice” means an improvement notice or a prohibition notice.

(2) A person on whom a notice is served may appeal, within 21 days from the date of its service, to the Employment Tribunal and on such an appeal the Tribunal may either cancel or affirm the notice and, if it affirms it, may do so either in its original form or with such modifications as the Tribunal may in the circumstances think fit.

(3) Where an appeal under this regulation is brought against a notice within the period allowed under subregulation (2) then-

- (a) in the case of an improvement notice, the bringing of the appeal shall have the effect of suspending the operation of the notice until the appeal is finally disposed of or, if the appeal is withdrawn, until the withdrawal of the appeal;
- (b) in the case of a prohibition notice, the bringing of the appeal shall have the like effect if, on the application of the appellant, the Tribunal so directs (and then only from the giving of the direction).

## **Power to deal with cause of imminent danger.**

23.(1) Where, in the case of any article or substance found by him in any premises which he has power to enter, an inspector has reasonable cause to believe that, in the circumstances in which he finds it, the article or substance is a cause of imminent danger of serious personal injury, he may seize it and cause it to be rendered harmless (whether by destruction or otherwise).

(2) Before there is rendered harmless under this regulation-

- (a) any article that forms part of a batch of similar articles; or

- (b) any substance,

the inspector shall, if it is practicable for him to do so, take a sample thereof and give to a responsible person at the premises where the article or substance was found by him a portion of the sample marked in a manner sufficient to identify it.

(3) As soon as may be after any article or substance has been seized and rendered harmless under this regulation, the inspector shall prepare and sign a written report giving particulars of the circumstances in which the article or substance was seized and so dealt with by him, and shall-

- (a) give a signed copy of the report to a responsible person at the premises where the article or substance was found by him; and
- (b) unless that person is the owner of the article or substance, serve a signed copy of the report on the owner;

and if, where paragraph (b) applies, the inspector cannot after reasonable enquiry ascertain the name or address of the owner, the copy may be served on him by giving it to the person to whom a copy was given under paragraph (a).

**Offences and penalties.**

24.(1) It is an offence for an operator or carrier to-

- (a) fail to discharge a duty imposed upon him by any of these Regulations;
- (b) contravene any requirement or prohibition imposed by any of these Regulations.

(2) A person guilty of an offence under subregulation (1) is liable on summary conviction to a fine of four times the amount at level 5 on the standard scale.

(3) Where an offence under these Regulations committed by a body corporate is proved to have been committed with the consent or connivance of, or to have been attributable to any neglect on the part of, any director, manager, secretary or other similar officer of the body corporate or a person who was purporting to act in any such capacity he, as well as the body corporate, is guilty of that offence and is liable to be proceeded against and punished accordingly.

(4) Where the commission by any person of an offence under these Regulations is due to the act or default of some other person, that person is guilty of the offence, and a person may be charged with and convicted of the offence by virtue of this subregulation whether or not proceedings are taken against the first mentioned person.

(5) Where there would be or would have been the commission of an offence under this regulation by the Crown but for the circumstance that, by virtue of regulation 29(1), this regulation does not bind the Crown, and that fact is due to the act or default of a person other than the Crown, that person is guilty of an offence which, but for that circumstance, the Crown would be committing or would have committed, and may be charged with and convicted of that offence accordingly.

## **Defence.**

25.(1) In any proceedings against an employer for an offence under regulation 4(1), it shall be a defence for that employer to prove that-

- (a) he neither knew nor had reasonable cause to believe that he had carried out for the first time any work with ionising radiation to which these Regulations apply; and
- (b) in a case where he had discovered that he had carried out such work for the first time, he had made an assessment in accordance with the requirements of regulation 4(1), as soon as was practicable following his discovery.

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

## **Onus of proving limits of what is practicable etc.**

26. In any proceedings for an offence in contravention of these Regulations consisting of a failure to comply with a duty or requirement to do something so far as is practicable or so far as is reasonably practicable, it shall be for the accused to prove (as the case may be) that it was not practicable or not reasonably practicable to do more than was in fact done to satisfy the duty or requirement.

## **Evidence.**

27.(1) Where an entry is required by any of these Regulations to be made in any register or other record, the entry, if made, shall, as against the person by or on whose behalf it was made, be admissible as evidence of the facts stated therein.

(2) Where an entry which is required to be made in any register or other record with respect to the observance of any of these Regulations has not been made, that fact shall be admissible as evidence that that regulation has not been observed.

**Civil liability.**

28.(1) Breach of any duty or prohibition imposed by these Regulations by an operator or carrier, in so far as it causes damage, shall be actionable in civil proceedings.

(2) Any term of an agreement which purports to exclude or restrict the operation of subregulation (1), or any liability arising by virtue of that subregulation, shall be void.

**Application to the Crown.**

29.(1) The provisions of these Regulations, except regulations 19 to 27, shall bind the Crown.

(2) Although they do not bind the Crown, regulations 19 to 27 shall apply to persons in the public service of the Crown, as they apply to other persons.

(3) For the purposes of these Regulations, persons in the service of the Crown shall be treated as employees of the Crown, whether or not they would be so treated apart from this subregulation.

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

30.(1) In this regulation, any reference to-

- (a) “visiting forces” is a reference to visiting forces within the meaning of any provision of Part I of the Visiting Forces Act 1952, 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.

(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 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, except that, where any such exemption is granted, suitable arrangements shall be made for the assessment and recording of doses of ionising radiation received by persons to whom the exemption relates.

## **Transitional provisions.**

31.(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 paragraphs (c) and (d) of regulation 4(1) shall be deemed to have been made pursuant to regulation 4(1).

(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 competent authority pursuant to regulation 6(1) shall be deemed to have complied with that provision if such report is sent to the competent authority within 5 months of that date (or within such longer time as the competent authority may agree);
- (b)
  - (i) an operator who is required to prepare an operator's emergency plan pursuant to regulation 7(1);
  - (ii) a carrier who is required to ensure that a carrier's emergency plan is prepared pursuant to regulation 8(1),

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shall be deemed to have complied with that provision if the plan is prepared within 6 months of that date (or within such longer time as the competent authority may agree) and in such a case regulation 7(2) or 8(2), as the case may be, shall not apply;

- (c) an operator who is required to provide information to the Environmental Agency in accordance with regulation 9(7) shall be deemed to have complied with that provision if such information is provided to the Agency within 6 months of that date (or within such longer time as the competent authority may agree); and
- (d) an operator or carrier who is required, pursuant to regulation 14(2), to notify to the competent authority the dose levels which he has determined are appropriate, shall be deemed to have complied with that provision if such notification is given to the competent authority within 5 months of that date (or within such longer time as the competent authority may agree).

(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 1995, the operator or carrier concerned shall be deemed to have complied with regulation 16(1) of these Regulations (to the extent that the information supplied relates to matters to which these Regulations apply), for a period of 3 years-

- (a) from the date upon which it was supplied; or
- (b) where that information has been updated, from the date upon which it was last updated; and

for the purposes of these Regulations, that information shall be treated as if it had been supplied pursuant to regulation 16(1).

**Revocation of Regulations.**

32. The Public Information for Radiation Emergencies Regulations 1995 are revoked.

## **SCHEDULE 1**

Regulation 2(1)

### **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;
  - (b) an equivalent dose for the skin of 50 mSv in the period of one year immediately following the radiation emergency over any 1 cm<sup>2</sup> area of skin, regardless of the area exposed.
3. In this Schedule-
  - (a) “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) “equivalent dose”, in relation to a human organ or tissue, includes the committed equivalent dose to that organ or tissue from internal radiation;
  - (c) “external radiation” means, in relation to any person, the ionising radiation coming from outside the body of that person; and
  - (d) “internal radiation” means, in relation to any person, the ionising radiation coming from inside the body of that person.

## SCHEDULE 2

Regulation 3(1)(a) and (2)

## SPECIFIED QUANTITIES OF RADIONUCLIDES ON PREMISES

## PART I

Table of Radionuclides

Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Actinium</b> Ac-224 Ac-225 Ac-226 Ac-227 Ac-228		2 10 <sup>11</sup> 3 10 <sup>9</sup> 2 10 <sup>10</sup> 4 10 <sup>7</sup> 5 10 <sup>11</sup>
<b>Aluminium</b> Al-26		7 10 <sup>10</sup>
<b>Americium</b> Am-237 Am-238 Am-239 Am-240 Am-241 Am-242 Am-242m Am-243 Am-244 Am-244m Am-245 Am-246 Am-246m		4 10 <sup>12</sup> 6 10 <sup>12</sup> 2 10 <sup>12</sup> 4 10 <sup>12</sup> 3 10 <sup>8</sup> 1 10 <sup>12</sup> 3 10 <sup>8</sup> 3 10 <sup>8</sup> 2 10 <sup>12</sup> 2 10 <sup>14</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup>
<b>Antimony</b> Sb-115 Sb-116 Sb-116m Sb-117 Sb-118m Sb-119		2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>13</sup> 7 10 <sup>12</sup> 1 10 <sup>13</sup>



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<b>Radionuclide name &amp; symbol</b>	<b>Radionuclide form</b>	<b>Quantity (Bq)</b>
Sb-120	(long lived isotope)	3 10 <sup>12</sup>
Sb-120	(short lived isotope)	2 10 <sup>12</sup>
Sb-122		2 10 <sup>12</sup>
Sb-124		4 10 <sup>11</sup>
Sb-124m		4 10 <sup>12</sup>
Sb-125		4 10 <sup>11</sup>
Sb-126		1 10 <sup>12</sup>
Sb-126m		2 10 <sup>12</sup>
Sb-127		2 10 <sup>12</sup>
Sb-128	(long lived isotope)	2 10 <sup>12</sup>
Sb-128	(short lived isotope)	1 10 <sup>12</sup>
Sb-129		2 10 <sup>12</sup>
Sb-130		1 10 <sup>12</sup>
Sb-131		2 10 <sup>12</sup>
<b>Argon</b>		
Ar-37	(gas)	4 10 <sup>17</sup>
Ar-39	(gas)	2 10 <sup>16</sup>
Ar-41	(gas)	4 10 <sup>13</sup>
<b>Arsenic</b>		
As-69		7 10 <sup>11</sup>
As-70		1 10 <sup>12</sup>
As-71		3 10 <sup>12</sup>
As-72		9 10 <sup>11</sup>
As-73		8 10 <sup>12</sup>
As-74		2 10 <sup>12</sup>
As-76		9 10 <sup>11</sup>
As-77		2 10 <sup>12</sup>
As-78		7 10 <sup>11</sup>
<b>Astatine</b>		
At-207		4 10 <sup>12</sup>
At-211		2 10 <sup>11</sup>
<b>Barium</b>		
Ba-126		2 10 <sup>13</sup>
Ba-128		1 10 <sup>13</sup>
Ba-131		6 10 <sup>12</sup>
Ba-131m		3 10 <sup>12</sup>
Ba-133		4 10 <sup>11</sup>
Ba-133m		2 10 <sup>12</sup>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Ba-135m Ba-139 Ba-140 Ba-141 Ba-142		2 10 <sup>12</sup> 11, 0 <sup>12</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 2 10 <sup>12</sup>
<b>Berkelium</b> 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>
<b>Beryllium</b> Be-7 Be-10		2 10 <sup>13</sup> 6 10 <sup>11</sup>
<b>Bismuth</b> 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>
<b>Bromine</b> Br-74 Br-74m Br-75 Br-76 Br-77		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>
Br-80 Br-80m Br-82 Br-83 Br-84		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>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Cadmium</b>		
Cd-104		1 10 <sup>13</sup>
Cd-107		4 10 <sup>12</sup>
Cd-109		2 10 <sup>12</sup>
Cd-113		2 10 <sup>11</sup>
Cd-113m		1 10 <sup>11</sup>
Cd-115		2 10 <sup>12</sup>
Cd-115m		2 10 <sup>12</sup>
Cd-117		2 10 <sup>12</sup>
Cd-117m		2 10 <sup>12</sup>
<b>Caesium</b>		
Cs-125		2 10 <sup>12</sup>
Cs-127		1 10 <sup>13</sup>
Cs-129		2 10 <sup>13</sup>
Cs-130		2 10 <sup>12</sup>
Cs-131		6 10 <sup>13</sup>
Cs-132		9 10 <sup>12</sup>
Cs-134		7 10 <sup>10</sup>
Cs-134m		4 10 <sup>12</sup>
Cs-135		9 10 <sup>11</sup>
Cs-135m		8 10 <sup>12</sup>
Cs-136		8 10 <sup>11</sup>
Cs-137		1 10 <sup>11</sup>
Cs-138		8 10 <sup>11</sup>
<b>Calcium</b>		
Ca-41		3 10 <sup>13</sup>
Ca-45		3 10 <sup>12</sup>
Ca-47		2 10 <sup>12</sup>
<b>Californium</b>		
Cf-244		2 10 <sup>12</sup>
Cf-246		5 10 <sup>10</sup>
Cf-248		2 10 <sup>9</sup>
Cf-249		3 10 <sup>8</sup>
Cf-250		7 10 <sup>8</sup>
Cf-251		3 10 <sup>8</sup>
Cf-252		1 10 <sup>9</sup>
Cf-253		2 10 <sup>10</sup>
Cf-254		4 10 <sup>8</sup>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Carbon</b>		
C-11		2 10 <sup>12</sup>
C-11	(vapour)	1 10 <sup>14</sup>
C-11	(dioxide gas)	1 10 <sup>14</sup>
C-11	(monoxide gas)	1 10 <sup>14</sup>
C-14		3 10 <sup>12</sup>
C-14	(vapour)	4 10 <sup>13</sup>
C-14	(dioxide gas)	3 10 <sup>15</sup>
C-14	(monoxide gas)	1 10 <sup>16</sup>
<b>Cerium</b>		
Ce-134		1 10 <sup>13</sup>
Ce-135		2 10 <sup>12</sup>
Ce-137		2 10 <sup>13</sup>
Ce-137m		2 10 <sup>12</sup>
Ce-139		2 10 <sup>12</sup>
Ce-141		2 10 <sup>12</sup>
Ce-143		2 10 <sup>12</sup>
Ce-144		3 10 <sup>11</sup>
<b>Chlorine</b>		
Cl-36		2 10 <sup>12</sup>
Cl-38		6 10 <sup>11</sup>
Cl-39		1 10 <sup>12</sup>
<b>Chromium</b>		
Cr-48		4 10 <sup>13</sup>
Cr-49		2 10 <sup>12</sup>
Cr-51		3 10 <sup>13</sup>
<b>Cobalt</b>		
Co-55		2 10 <sup>12</sup>
Co-56		2 10 <sup>11</sup>
Co-57		1 10 <sup>12</sup>
Co-58		6 10 <sup>11</sup>
Co-58m		2 10 <sup>13</sup>
Co-60		6 10 <sup>10</sup>
Co-60m		7 10 <sup>12</sup>
Co-61		2 10 <sup>12</sup>
Co-62m		9 10 <sup>11</sup>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Copper</b> 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>
<b>Curium</b> 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>
<b>Dysprosium</b> 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>
<b>Einsteinium</b> Es-250 Es-251 Es-253		1 10 <sup>13</sup> 6 10 <sup>12</sup> 8 10 <sup>9</sup>
Es-254 Es-254m		2 10 <sup>9</sup> 5 10 <sup>10</sup>
<b>Erbium</b> 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>
<b>Europium</b>		

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Eu-145	(long lived isotope) (short lived isotope)	4 10 <sup>12</sup>
Eu-146		3 10 <sup>12</sup>
Eu-147		4 10 <sup>12</sup>
Eu-148		4 10 <sup>11</sup>
Eu-149		8 10 <sup>12</sup>
Eu-150		1 10 <sup>11</sup>
Eu-150		2 10 <sup>12</sup>
Eu-152		1 10 <sup>11</sup>
Eu-152m		2 10 <sup>12</sup>
Eu-154		1 10 <sup>11</sup>
Eu-155		2 10 <sup>12</sup>
Eu-156		2 10 <sup>12</sup>
Eu-157		2 10 <sup>12</sup>
Eu-158		1 10 <sup>12</sup>
<b>Fermium</b>		
Fm-252		7 10 <sup>10</sup>
Fm-253		6 10 <sup>10</sup>
Fm-254		3 10 <sup>11</sup>
Fm-255		9 10 <sup>10</sup>
Fm-257		3 10 <sup>9</sup>
<b>Fluorine</b>		
F-18		2 10 <sup>12</sup>
<b>Francium</b>		
Fr-222		1 10 <sup>12</sup>
Fr-223		2 10 <sup>12</sup>
<b>Gadolinium</b>		
Gd-145		2 10 <sup>12</sup>
Gd-146		2 10 <sup>12</sup>
Gd-147		5 10 <sup>12</sup>
Gd-148		9 10 <sup>8</sup>
Gd-149		6 10 <sup>12</sup>
Gd-151		5 10 <sup>12</sup>
Gd-152		1 10 <sup>9</sup>
Gd-153		2 10 <sup>12</sup>
Gd-159		2 10 <sup>12</sup>
<b>Gallium</b>		
Ga-65		1 10 <sup>12</sup>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Ga-66 Ga-67 Ga-68 Ga-70 Ga-72 Ga-73		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>
<b>Germanium</b> 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>
<b>Gold</b> 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>
<b>Hafnium</b> 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>

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



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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
I-120	(methyl iodide vapour)	2 10 <sup>13</sup>
I-120m		7 10 <sup>11</sup>
I-120m	(elemental vapour)	2 10 <sup>13</sup>
I-120m	(methyl iodide vapour)	2 10 <sup>13</sup>
I-121		4 10 <sup>12</sup>
I-121	(elemental vapour)	1 10 <sup>14</sup>
I-121	(methyl iodide vapour)	1 10 <sup>14</sup>
I-123		9 10 <sup>12</sup>
I-123	(elemental vapour)	5 10 <sup>13</sup>
I-123	(methyl iodide vapour)	6 10 <sup>13</sup>
I-124		2 10 <sup>12</sup>
I-124	(elemental vapour)	9 10 <sup>11</sup>
I-124	(methyl iodide vapour)	1 10 <sup>12</sup>
I-125		1 10 <sup>11</sup>
I-125	(elemental vapour)	1 10 <sup>12</sup>
I-125	(methyl iodide vapour)	1 10 <sup>12</sup>
I-126		8 10 <sup>11</sup>
I-126	(elemental vapour)	5 10 <sup>11</sup>
I-126	(methyl iodide vapour)	6 10 <sup>11</sup>
I-128		1 10 <sup>12</sup>
I-128	(elemental vapour)	2 10 <sup>14</sup>
I-128	(methyl iodide vapour)	5 10 <sup>14</sup>
I-129		1 10 <sup>10</sup>
I-129	(elemental vapour)	2 10 <sup>11</sup>
I-129	(methyl iodide vapour)	2 10 <sup>11</sup>
I-130		3 10 <sup>12</sup>
I-130	(elemental vapour)	5 10 <sup>12</sup>
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>

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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>
<b>Iridium</b>		
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>
<b>Iron</b>		
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>
<b>Krypton</b>		
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>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Kr-88	(gas)	$3 \times 10^{13}$
<b>Lanthanum</b> La-131 La-132 La-135 La-137 La-138 La-140 La-141 La-142 La-143		$2 \times 10^{12}$ $2 \times 10^{12}$ $2 \times 10^{14}$ $2 \times 10^{12}$ $2 \times 10^{11}$ $2 \times 10^{12}$ $1 \times 10^{12}$ $1 \times 10^{12}$ $7 \times 10^{11}$
<b>Lead</b> Pb-195m Pb-198 Pb-199 Pb-200 Pb-201		$2 \times 10^{12}$ $4 \times 10^{12}$ $6 \times 10^{12}$ $3 \times 10^{12}$ $8 \times 10^{12}$
Pb-202 Pb-202m Pb-203 Pb-205 Pb-209 Pb-210 Pb-211 Pb-212 Pb-214		$6 \times 10^{11}$ $4 \times 10^{12}$ $9 \times 10^{12}$ $1 \times 10^{13}$ $2 \times 10^{12}$ $3 \times 10^9$ $2 \times 10^{12}$ $1 \times 10^{11}$ $1 \times 10^{12}$
<b>Lutetium</b> Lu-169 Lu-170 Lu-171 Lu-172 Lu-173 Lu-174 Lu-174m Lu-176 Lu-176m Lu-177 Lu-177m Lu-178		$6 \times 10^{12}$ $3 \times 10^{12}$ $4 \times 10^{12}$ $3 \times 10^{12}$ $2 \times 10^{12}$ $1 \times 10^{12}$ $3 \times 10^{12}$ $3 \times 10^{11}$ $2 \times 10^{12}$ $3 \times 10^{12}$ $3 \times 10^{11}$ $1 \times 10^{12}$

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Lu-178m		1 10 <sup>12</sup>
Lu-179		2 10 <sup>12</sup>
<b>Magnesium</b> Mg-28		5 10 <sup>12</sup>
<b>Manganese</b> 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>
<b>Mendelevium</b> Md-257 Md-258		9 10 <sup>11</sup> 4 10 <sup>9</sup>
<b>Mercury</b> Hg-193 Hg-193 Hg-193 Hg-193m Hg-193m Hg-193m Hg-194 Hg-194 Hg-194 Hg-195 Hg-195 Hg-195 Hg-195m Hg-195m Hg-195m Hg-197 Hg-197 Hg-197 Hg-197m Hg-197m Hg-197m Hg-199m Hg-199m	(organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic) (vapour) (organic) (inorganic)	3 10 <sup>12</sup> 3 10 <sup>12</sup> 2 10 <sup>13</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 6 10 <sup>12</sup> 3 10 <sup>11</sup> 1 10 <sup>12</sup> 6 10 <sup>11</sup> 5 10 <sup>12</sup> 5 10 <sup>12</sup> 1 10 <sup>13</sup> 3 10 <sup>12</sup> 3 10 <sup>12</sup> 3 10 <sup>12</sup> 7 10 <sup>12</sup> 7 10 <sup>12</sup> 5 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 4 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup>

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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>
<b>Molybdenum</b>		
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>
<b>Neodymium</b>		
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>
<b>Neon</b>		
Ne-19	(gas)	6 10 <sup>13</sup>
<b>Neptunium</b>		
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>
<b>Nickel</b>		
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>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
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>
<b>Niobium</b>		
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>
<b>Nitrogen</b>		
N-13	(gas)	6 10 <sup>13</sup>
<b>Osmium</b>		
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>
<b>Palladium</b>		
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>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Phosphorus</b> P-32 P-33		1 10 <sup>11</sup> 3 10 <sup>12</sup>
<b>Platinum</b> Pt-186 Pt-188 Pt-189 Pt-191 Pt-193		9 10 <sup>13</sup> 6 10 <sup>12</sup> 6 10 <sup>12</sup> 7 10 <sup>12</sup> 1 10 <sup>14</sup>
Pt-193m Pt-195m Pt-197 Pt-197m Pt-199 Pt-200		3 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>
<b>Plutonium</b> 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> 2 10 <sup>12</sup> 2 10 <sup>12</sup>
<b>Polonium</b> 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>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Potassium</b> 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>
<b>Praseodymium</b> Pr-136		1 10 <sup>12</sup>
Pr-137 Pr-138m Pr-139 Pr-142 Pr-142m Pr-143 Pr-144 Pr-145 Pr-147		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>
<b>Promethium</b> 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>
<b>Protactinium</b> 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>



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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Radium</b> 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>
<b>Rhenium</b> 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>
<b>Rhodium</b> 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>
<b>Rubidium</b> Rb-79 Rb-81 Rb-81m Rb-82m Rb-83		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>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Rb-84 Rb-86 Rb-87 Rb-88 Rb-89		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>
<b>Ruthenium</b> 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>
<b>Samarium</b> 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>
<b>Scandium</b> 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>
<b>Selenium</b> Se-70 Se-73		2 10 <sup>12</sup> 2 10 <sup>12</sup>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Se-73m		2 10 <sup>12</sup>
Se-75		2 10 <sup>11</sup>
Se-79		5 10 <sup>10</sup>
Se-81		2 10 <sup>12</sup>
Se-81m		4 10 <sup>12</sup>
Se-83		2 10 <sup>12</sup>
<b>Silicon</b>		
Si-31		2 10 <sup>12</sup>
Si-32		2 10 <sup>11</sup>
<b>Silver</b>		
Ag-102		1 10 <sup>12</sup>
Ag-103		2 10 <sup>12</sup>
Ag-104		3 10 <sup>12</sup>
Ag-104m		2 10 <sup>12</sup>
Ag-105		2 10 <sup>12</sup>
Ag-106		2 10 <sup>12</sup>
Ag-106m		2 10 <sup>12</sup>
Ag-108m		1 10 <sup>11</sup>
Ag-110m		3 10 <sup>10</sup>
Ag-111		2 10 <sup>12</sup>
Ag-112		7 10 <sup>11</sup>
Ag-115		9 10 <sup>11</sup>
<b>Sodium</b>		
Na-22		1 10 <sup>11</sup>
Na-24		2 10 <sup>12</sup>
<b>Strontium</b>		
Sr-80		1 10 <sup>14</sup>
Sr-81		9 10 <sup>11</sup>
Sr-82		2 10 <sup>12</sup>
Sr-83		3 10 <sup>12</sup>
Sr-85		1 10 <sup>12</sup>
Sr-85m		3 10 <sup>13</sup>
Sr-87m		7 10 <sup>12</sup>
Sr-89		1 10 <sup>12</sup>
Sr-90		8 10 <sup>10</sup>
Sr-91		2 10 <sup>12</sup>
Sr-92		2 10 <sup>12</sup>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Sulphur</b> 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>
<b>Tantalum</b> Ta-172 Ta-173 Ta-174 Ta-175 Ta-176 Ta-177 Ta-178 Ta-179 Ta-180 Ta-180m Ta-182 Ta-182m Ta-183 Ta-184 Ta-185 Ta-186	(long lived isotope)	2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 2 10 <sup>12</sup> 3 10 <sup>12</sup> 1 10 <sup>13</sup> 3 10 <sup>12</sup> 6 10 <sup>12</sup> 9 10 <sup>11</sup> 6 10 <sup>12</sup> 3 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> 9 10 <sup>11</sup>
<b>Technetium</b> Tc-93 Tc-93m Tc-94 Tc-94m Tc-95 Tc-95m Tc-96 Tc-96m Tc-97 Tc-97m Tc-98 Tc-99 Tc-99m Tc-101 Tc-104		5 10 <sup>13</sup> 4 10 <sup>12</sup> 6 10 <sup>12</sup> 1 10 <sup>12</sup> 4 10 <sup>13</sup> 1 10 <sup>12</sup> 4 10 <sup>12</sup> 2 10 <sup>13</sup> 9 10 <sup>12</sup> 5 10 <sup>12</sup> 1 10 <sup>11</sup> 5 10 <sup>10</sup> 1 10 <sup>13</sup> 2 10 <sup>12</sup> 6 10 <sup>11</sup>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Tellurium</b>		
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>
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>
<b>Terbium</b>		
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>

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Tb-156	(long lived isotope) (short lived isotope)	$3 \times 10^{12}$
Tb-156m		$1 \times 10^{13}$
Tb-156m		$4 \times 10^{12}$
Tb-157		$1 \times 10^{13}$
Tb-158		$2 \times 10^{11}$
Tb-160		$5 \times 10^{11}$
Tb-161		$2 \times 10^{12}$
<b>Thallium</b>		
Tl-194		$1 \times 10^{13}$
Tl-194m		$2 \times 10^{12}$
Tl-195		$4 \times 10^{12}$
Tl-197		$5 \times 10^{12}$
Tl-198		$7 \times 10^{12}$
Tl-198m		$2 \times 10^{12}$
Tl-199		$6 \times 10^{12}$
Tl-200		$1 \times 10^{13}$
Tl-201		$7 \times 10^{12}$
Tl-202		$7 \times 10^{12}$
Tl-204		$2 \times 10^{12}$
<b>Thorium</b>		
Th-226		$4 \times 10^{11}$
Th-227		$2 \times 10^9$
Th-228		$6 \times 10^8$
Th-229		$1 \times 10^8$
Th-230		$2 \times 10^8$
Th-231		$2 \times 10^{12}$
Th-232		$2 \times 10^8$
Th-234		$3 \times 10^{12}$
<b>Thulium</b>		
Tm-162		$2 \times 10^{12}$
Tm-166		$3 \times 10^{12}$
Tm-167		$4 \times 10^{12}$
Tm-170		$2 \times 10^{12}$
Tm-171		$1 \times 10^{13}$
Tm-172		$2 \times 10^{12}$
Tm-173		$2 \times 10^{12}$
Tm-175		$2 \times 10^{12}$
<b>Tin</b>		

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
Sn-110		6 10 <sup>13</sup>
Sn-111		2 10 <sup>12</sup>
Sn-113		5 10 <sup>12</sup>
Sn-117m		3 10 <sup>12</sup>
Sn-119m		5 10 <sup>12</sup>
Sn-121		3 10 <sup>12</sup>
Sn-121m		4 10 <sup>12</sup>
Sn-123		2 10 <sup>12</sup>
Sn-123m		2 10 <sup>12</sup>
Sn-125		1 10 <sup>12</sup>
Sn-126		5 10 <sup>11</sup>
Sn-127		2 10 <sup>12</sup>
Sn-128		2 10 <sup>12</sup>
<b>Titanium</b>		
Ti-44		2 10 <sup>11</sup>
Ti-45		2 10 <sup>12</sup>
<b>Tungsten</b>		
W-176		5 10 <sup>12</sup>
W-177		3 10 <sup>12</sup>
W-178		6 10 <sup>13</sup>
W-179		1 10 <sup>13</sup>
W-181		1 10 <sup>13</sup>
W-185		4 10 <sup>12</sup>
W-187		2 10 <sup>12</sup>
W-188		3 10 <sup>12</sup>
<b>Uranium</b>		
U-230		2 10 <sup>9</sup>
U-231		7 10 <sup>12</sup>
U-232		6 10 <sup>8</sup>
U-233		3 10 <sup>9</sup>
U-234		3 10 <sup>9</sup>
U-235		3 10 <sup>9</sup>
U-236		3 10 <sup>9</sup>
U-237		2 10 <sup>12</sup>
U-238		3 10 <sup>9</sup>
U-239		2 10 <sup>12</sup>
U-240		2 10 <sup>12</sup>
<b>Vanadium</b>		

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Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
V-47		1 10 <sup>12</sup>
V-48		1 10 <sup>12</sup>
V-49		2 10 <sup>14</sup>
<b>Xenon</b>		
Xe-120	(gas)	1 10 <sup>14</sup>
Xe-121	(gas)	3 10 <sup>13</sup>
Xe-122	(gas)	1 10 <sup>15</sup>
Xe-123	(gas)	9 10 <sup>13</sup>
Xe-125	(gas)	2 10 <sup>14</sup>
Xe-127	(gas)	2 10 <sup>14</sup>
Xe-129m	(gas)	2 10 <sup>15</sup>
Xe-131	(gas)	4 10 <sup>15</sup>
Xe-133	(gas)	1 10 <sup>15</sup>
Xe-133m	(gas)	2 10 <sup>15</sup>
Xe-135	(gas)	2 10 <sup>14</sup>
Xe-135m	(gas)	1 10 <sup>14</sup>
Xe-138	(gas)	5 10 <sup>13</sup>
<b>Ytterbium</b>		
Yb-162		1 10 <sup>13</sup>
Yb-166		8 10 <sup>12</sup>
Yb-167		4 10 <sup>12</sup>
Yb-169		3 10 <sup>12</sup>
Yb-175		4 10 <sup>12</sup>
Yb-177		2 10 <sup>12</sup>
Yb-178		2 10 <sup>12</sup>
<b>Yttrium</b>		
Y-86		2 10 <sup>12</sup>
Y-86m		1 10 <sup>13</sup>
Y-87		2 10 <sup>13</sup>
Y-88		2 10 <sup>11</sup>
Y-90		2 10 <sup>12</sup>
Y-90m		7 10 <sup>12</sup>
Y-91		2 10 <sup>12</sup>
Y-91m		2 10 <sup>13</sup>
Y-92		6 10 <sup>11</sup>
Y-93		8 10 <sup>11</sup>
Y-94		6 10 <sup>11</sup>
Y-95		6 10 <sup>11</sup>



Radionuclide name & symbol	Radionuclide form	Quantity (Bq)
<b>Zinc</b> 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>
<b>Zirconium</b> 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 competent authority 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-

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

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

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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 U 233- 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.

## SCHEDULE 4

Regulation 3(1)(b) and 3(3)

SPECIFIED QUANTITIES OF  
RADIONUCLIDES FOR TRANSPORT

## PART I

## Table of Radionuclides

Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
<b>Actinium</b> Ac-225 Ac-227 Ac-228	(see Note 1) (see Note 1)	6 10 <sup>9</sup> 9 10 <sup>7</sup> 5 10 <sup>11</sup>
<b>Aluminium</b> Al-26		1 10 <sup>11</sup>
<b>Americium</b> Am-241 Am-242m Am-243	(see Note 1) (see Note 1)	1 10 <sup>9</sup> 1 10 <sup>9</sup> 1 10 <sup>9</sup>
<b>Antimony</b> Sb-122 Sb-124 Sb-125 Sb-126		4 10 <sup>11</sup> 6 10 <sup>11</sup> 1 10 <sup>12</sup> 4 10 <sup>11</sup>
<b>Argon</b> Ar-37 Ar-39 Ar-41		4 10 <sup>13</sup> 2 10 <sup>13</sup> 3 10 <sup>11</sup>
<b>Arsenic</b> As-72 As-73 As-74 As-76 As-77		3 10 <sup>11</sup> 4 10 <sup>13</sup> 9 10 <sup>11</sup> 3 10 <sup>11</sup> 7 10 <sup>11</sup>
<b>Astatine</b> At-211	(see Note 1)	5 10 <sup>11</sup>
<b>Barium</b> Ba-131 Ba-133	(see Note 1)	2 10 <sup>12</sup> 3 10 <sup>12</sup>

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<b>Radionuclide name, symbol</b>	<b>Radionuclide form</b>	<b>Quantity (Bq)</b>
Ba-133m Ba-140	(see Note 1)	6 10 <sup>11</sup> 3 10 <sup>11</sup>
<b>Berkelium</b> Bk-247 Bk-249	(see Note 1)	8 10 <sup>8</sup> 3 10 <sup>11</sup>
<b>Beryllium</b> Be-7 Be-10		2 10 <sup>13</sup> 6 10 <sup>11</sup>
<b>Bismuth</b> Bi-205 Bi-206 Bi-207 Bi-210 Bi-210m Bi-212	(see Note 1) (see Note 1)	7 10 <sup>11</sup> 3 10 <sup>11</sup> 7 10 <sup>11</sup> 6 10 <sup>11</sup> 2 10 <sup>10</sup> 6 10 <sup>11</sup>
<b>Bromine</b> Br-76 Br-77 Br-82		4 10 <sup>11</sup> 3 10 <sup>12</sup> 4 10 <sup>11</sup>
<b>Cadmium</b> Cd-109 Cd-113m Cd-115 Cd-115m	(see Note 1)	2 10 <sup>12</sup> 5 10 <sup>11</sup> 4 10 <sup>11</sup> 5 10 <sup>11</sup>
<b>Caesium</b> 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>
<b>Calcium</b> Ca-41 Ca-45 Ca-47	(see Note 1)	unlimited 1 10 <sup>12</sup> 3 10 <sup>11</sup>
<b>Californium</b>		

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Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
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>
<b>Carbon</b> C-11 C-14		6 10 <sup>11</sup> 3 10 <sup>12</sup>
<b>Cerium</b> 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>
<b>Chlorine</b> Cl-36 Cl-38		6 10 <sup>11</sup> 2 10 <sup>11</sup>
<b>Chromium</b> Cr-51		3 10 <sup>13</sup>
<b>Cobalt</b> 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>
<b>Copper</b> Cu-64 Cu-67		1 10 <sup>12</sup> 7 10 <sup>11</sup>
<b>Curium</b> 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>

<b>Radionuclide name, symbol</b>	<b>Radionuclide form</b>	<b>Quantity (Bq)</b>
<b>Dysprosium</b> Dy-159 Dy-165 Dy-166	(see Note 1)	2 10 <sup>13</sup> 6 10 <sup>11</sup> 3 10 <sup>11</sup>
<b>Erbium</b> Er-169 Er-171		1 10 <sup>12</sup> 5 10 <sup>11</sup>
<b>Europium</b> 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>
<b>Fluorine</b> F-18		6 10 <sup>11</sup>
<b>Gadolinium</b> 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>
<b>Gallium</b> Ga-67 Ga-68 Ga-72		3 10 <sup>12</sup> 5 10 <sup>11</sup> 4 10 <sup>11</sup>
<b>Germanium</b> Ge-68 Ge-71 Ge-77	(see Note 1)	5 10 <sup>11</sup> 4 10 <sup>13</sup> 3 10 <sup>11</sup>
<b>Gold</b> 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>
<b>Hafnium</b>		

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Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
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
<b>Holmium</b> Ho-166 Ho-166m		4 10 <sup>11</sup> 5 10 <sup>11</sup>
<b>Hydrogen</b> H-3		4 10 <sup>13</sup>
<b>Indium</b> 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>
<b>Iodine</b> 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>
<b>Iridium</b> 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>
<b>Iron</b> 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>
<b>Krypton</b> 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>
<b>Lanthanum</b>		



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<b>Radionuclide name, symbol</b>	<b>Radionuclide form</b>	<b>Quantity (Bq)</b>
La-137 La-140		6 10 <sup>12</sup> 4 10 <sup>11</sup>
<b>Lead</b> 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>
<b>Lutetium</b> 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>
<b>Magnesium</b> Mg-28	(see Note 1)	3 10 <sup>11</sup>
<b>Manganese</b> Mn-52 Mn-53 Mn-54 Mn-56		3 10 <sup>11</sup> unlimited 1 10 <sup>12</sup> 3 10 <sup>11</sup>
<b>Mercury</b> 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>
<b>Molybdenum</b> Mo-93 Mo-99	(see Note 1)	2 10 <sup>13</sup> 6 10 <sup>11</sup>
<b>Neodymium</b> Nd-147 Nd-149		6 10 <sup>11</sup> 5 10 <sup>11</sup>
<b>Neptunium</b> 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>
<b>Nickel</b>		

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Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Ni-59 Ni-63 Ni-65		unlimited $3 \times 10^{13}$ $4 \times 10^{11}$
<b>Niobium</b> Nb-93m Nb-94 Nb-95 Nb-97		$3 \times 10^{13}$ $7 \times 10^{11}$ $1 \times 10^{12}$ $6 \times 10^{11}$
<b>Nitrogen</b> N-13		$6 \times 10^{11}$
<b>Osmium</b> Os-185 Os-191 Os-191m Os-193 Os-194	(see Note 1)	$1 \times 10^{12}$ $2 \times 10^{12}$ $3 \times 10^{13}$ $6 \times 10^{11}$ $3 \times 10^{11}$
<b>Palladium</b> Pd-103 Pd-107 Pd-109	(see Note 1)	$4 \times 10^{13}$ unlimited $5 \times 10^{11}$
<b>Phosphorus</b> P-32 P-33		$5 \times 10^{11}$ $1 \times 10^{12}$
<b>Platinum</b> Pt-188 Pt-191 Pt-193 Pt-193m Pt-195m Pt-197 Pt-197m	(see Note 1)	$8 \times 10^{11}$ $3 \times 10^{12}$ $4 \times 10^{13}$ $5 \times 10^{11}$ $5 \times 10^{11}$ $6 \times 10^{11}$ $6 \times 10^{11}$
<b>Plutonium</b> 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)	$3 \times 10^9$ $2 \times 10^{13}$ $1 \times 10^9$ $1 \times 10^9$ $1 \times 10^9$ $6 \times 10^{10}$ $1 \times 10^9$ $1 \times 10^9$
<b>Polonium</b> Po-210		$2 \times 10^{10}$

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<b>Radionuclide name, symbol</b>	<b>Radionuclide form</b>	<b>Quantity (Bq)</b>
<b>Potassium</b> K-40 K-42 K-43		9 10 <sup>11</sup> 2 10 <sup>11</sup> 6 10 <sup>11</sup>
<b>Praseodymium</b> Pr-142 Pr-143		4 10 <sup>11</sup> 6 10 <sup>11</sup>
<b>Promethium</b> 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>
<b>Protactinium</b> Pa-230 Pa-231 Pa-233	(see Note 1)	7 10 <sup>10</sup> 4 10 <sup>8</sup> 7 10 <sup>11</sup>
<b>Radium</b> 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 10 <sup>9</sup> 2 10 <sup>10</sup> 4 10 <sup>9</sup> 3 10 <sup>9</sup> 2 10 <sup>10</sup>
<b>Radon</b> Rn-222	(see Note 1)	4 10 <sup>9</sup>
<b>Rhenium</b> Re-184 Re-184m Re-186 Re-187 Re-188 Re-189 Re-natural	(see Note 1)	1 10 <sup>12</sup> 1 10 <sup>12</sup> 6 10 <sup>11</sup> unlimited 4 10 <sup>11</sup> 6 10 <sup>11</sup> unlimited
<b>Rhodium</b> Rh-99 Rh-101 Rh-102		2 10 <sup>12</sup> 3 10 <sup>12</sup> 5 10 <sup>11</sup>

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Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
Rh-102m Rh-103m Rh-105		2 10 <sup>12</sup> 4 10 <sup>13</sup> 8 10 <sup>11</sup>
<b>Rubidium</b> Rb-81 Rb-83 Rb-84 Rb-86 Rb-87 Rb-natural	(see Note 1)	8 10 <sup>11</sup> 2 10 <sup>12</sup> 1 10 <sup>12</sup> 5 10 <sup>11</sup> unlimited unlimited
<b>Ruthenium</b> Ru-97 Ru-103 Ru-105 Ru-106	(see Note 1) (see Note 1) (see Note 1)	5 10 <sup>12</sup> 2 10 <sup>12</sup> 6 10 <sup>11</sup> 2 10 <sup>11</sup>
<b>Samarium</b> Sm-145 Sm-147 Sm-151 Sm-153		1 10 <sup>13</sup> unlimited 1 10 <sup>13</sup> 6 10 <sup>11</sup>
<b>Scandium</b> Sc-44 Sc-46 Sc-47 Sc-48		5 10 <sup>11</sup> 5 10 <sup>11</sup> 7 10 <sup>11</sup> 3 10 <sup>11</sup>
<b>Selenium</b> Se-75 Se-79		3 10 <sup>12</sup> 2 10 <sup>12</sup>
<b>Silicon</b> Si-31 Si-32		6 10 <sup>11</sup> 5 10 <sup>11</sup>
<b>Silver</b> Ag-105 Ag-108m Ag-110m Ag-111	(see Note 1) (see Note 1)	2 10 <sup>12</sup> 7 10 <sup>11</sup> 4 10 <sup>11</sup> 6 10 <sup>11</sup>
<b>Sodium</b> Na-22 Na-24		5 10 <sup>11</sup> 2 10 <sup>11</sup>
<b>Strontium</b> Sr-82	(see Note 1)	2 10 <sup>11</sup>

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<b>Radionuclide name, symbol</b>	<b>Radionuclide form</b>	<b>Quantity (Bq)</b>
Sr-85		2 10 <sup>12</sup>
Sr-85m		5 10 <sup>12</sup>
Sr-87m		3 10 <sup>12</sup>
Sr-89		6 10 <sup>11</sup>
Sr-90	(see Note 1)	3 10 <sup>11</sup>
Sr-91	(see Note 1)	3 10 <sup>11</sup>
Sr-92	(see Note 1)	3 10 <sup>11</sup>
<b>Sulphur</b> S-35		3 10 <sup>12</sup>
<b>Tantalum</b> Ta-178 Ta-179 Ta-182	(long lived isotope)	8 10 <sup>11</sup> 3 10 <sup>13</sup> 5 10 <sup>11</sup>
<b>Technetium</b> Tc-95m Tc-96 Tc-96m Tc-97 Tc-97m Tc-98 Tc-99 Tc99m	(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>
<b>Tellurium</b> Te-121 Te-121m Te-123m Te-125m Te-127 Te-127m Te-129 Te-129m Te-131m Te-132	     (see Note 1)  (see Note 1) (see Note 1) (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> 4 10 <sup>11</sup>
<b>Terbium</b> Tb-157 Tb-158 Tb-160		4 10 <sup>13</sup> 1 10 <sup>12</sup> 6 10 <sup>11</sup>
<b>Thallium</b> 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>

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Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
<b>Thorium</b> Th-227 Th-228 Th-229 Th-230 Th-231 Th-232 Th-234 Th-natural	(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
<b>Thulium</b> Tm-167 Tm-170 Tm-171		8 10 <sup>11</sup> 6 10 <sup>11</sup> 4 10 <sup>13</sup>
<b>Tin</b> Sn-113 Sn-117m Sn-119m Sn-121m Sn-123 Sn-125 Sn-126	(see Note 1)   (see Note 1)   (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>
<b>Titanium</b> Ti-44	(see Note 1)	4 10 <sup>11</sup>
<b>Tungsten</b> W-178 W-181 W-185 W-187 W-188	(see Note 1)    (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>
<b>Uranium</b> U-230 U-230 U-230 U-232 U-232 U-232	(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	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>

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Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
U-233	- see Note 4) (fast lung absorption - see Note 2)	9 10 <sup>10</sup>
U-233	(medium lung absorption - see Note 3)	2 10 <sup>10</sup>
U-233	(slow lung absorption - see Note 4)	6 10 <sup>9</sup>
U-234	(fast lung absorption - see note 2)	9 10 <sup>10</sup>
U-234	(medium lung absorption - see Note 3)	2 10 <sup>10</sup>
U-234	(slow lung absorption - see Note 4)	6 10 <sup>9</sup>
U-235	(all lung absorption types - see Notes 1, 2, 3 & 4)	unlimited
U-236	(fast lung absorption - see Note 2)	unlimited
U-236	(medium lung absorption - see Note 3)	2 10 <sup>10</sup>
U-236	(slow lung absorption - see Note 4)	6 10 <sup>9</sup>
U-238	(all lung absorption types - see Notes 2, 3 & 4)	unlimited
U-natural U (enriched to 20% or less) U-depleted	(see note 5)	unlimited unlimited unlimited
<b>Vanadium</b>		
V-48		4 10 <sup>11</sup>
V-49		4 10 <sup>13</sup>
<b>Xenon</b>		
Xe-122	(see note 1)	4 10 <sup>11</sup>
Xe-123		7 10 <sup>11</sup>
Xe-127		2 10 <sup>12</sup>
Xe-131m		4 10 <sup>13</sup>
Xe-133		1 10 <sup>13</sup>
Xe-135		2 10 <sup>12</sup>
<b>Ytterbium</b>		
Yb-169		1 10 <sup>12</sup>
Yb-175		9 10 <sup>11</sup>
<b>Yttrium</b>		

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Radionuclide name, symbol	Radionuclide form	Quantity (Bq)
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>
<b>Zinc</b> 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 competent authority 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—

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

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 5**

Regulation 6(5)

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

The following particulars are required to be included in an assessment report under regulation 6(5)-

- (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, and 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 journeys and the 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 the quantity or mass specified in Schedule 2 or 3, as the case may be, which description, where practicable, shall include details of the radionuclides present and their likely maximum quantities;
- (f) in the case of an assessment by or for a carrier, a description of any radioactive substance which is likely to exceed any quantity or mass specified in Schedule 4 or 3, as the case may be, which description, where practicable, shall 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 description and diagram of any single plant or enclosed system containing more than the quantity or mass of any radioactive substance specified in Schedule 2 or 3, as the case may be, or, in the case of transport of more than the quantity or mass of any radioactive substance specified in schedule 4 or 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 system and staffing arrangements by which the radioactive substance is controlled and by which the administrative or maintenance 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;

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- (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 need for an operator's emergency plan pursuant to regulation 7(1) or a carrier's emergency plan pursuant to regulation 8(1).

## SCHEDULE 6

Regulation 6(6)

### **FURTHER PARTICULARS WHICH THE COMPETENT AUTHORITY MAY REQUIRE**

A further assessment and report may be required under regulation 6(6) 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 or is to be controlled;
- (d) the safety systems, procedures and monitoring systems by which any hazard is or is to be 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;
- (j) the procedures for reporting of and learning from radiation emergencies.

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### **SCHEDULE 7**

Regulations 7(3)(a),  
8(3)(a) and;  
and 9(2)(c).

### **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(3)(a) is as follows-

- (a) the names or positions of persons authorised to set emergency procedures in motion and the person in charge of, and who will co-ordinate, the on-site mitigatory action;
- (b) the name or position of the person responsible for liaison with the Environmental Agency in relation to the preparation of the off-site emergency plan;
- (c) a description of the action to be taken to control, and to limit the consequences of, those reasonably foreseeable conditions or events which could be significant in triggering a radiation emergency, including a description of the safety equipment and resources available for deployment in such circumstances;
- (d) the arrangements for limiting the risks to persons on the premises of exposure to ionising radiation resulting from any reasonably foreseeable radiation emergency, including how such persons are to be provided with a warning in the event of such an emergency and the actions such persons will be expected to take on receipt of such a warning;
- (e) the arrangements for the provision of an early warning of a radiation emergency to the Government's Civil Contingency Committee, for the purpose of enabling the Committee to set the off-site emergency plan in motion, the type of information which will be included in such a warning and the arrangements for the provision of more detailed information to the Committee, as it becomes available;
- (f) the arrangements for the provision of assistance with off-site mitigatory action, in the event of a radiation emergency; and

- (g) the arrangements for permitting certain employees to receive emergency exposures, including the dose levels which have been determined to be appropriate to be applied to those employees.

## **PART II**

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

The information referred to in regulation 8(3)(a) is as follows-

- (a) the names or positions of persons authorised to set emergency procedures in motion and the person in charge of, and who will co-ordinate, the mitigatory action;
- (b) a description of the action to be taken to control, and to limit the consequences of, those reasonably foreseeable conditions or events which could be significant in triggering a radiation emergency, including a description of the safety equipment and resources available for deployment in such circumstances;
- (c) the arrangements for the provision of an early warning of an incident to such persons, bodies or authorities as the carrier considers appropriate, the type of information which will be included in such a warning and the arrangements for the provision of more detailed information to such persons, bodies or authorities as it becomes available;
- (d) the arrangements for permitting certain employees to receive emergency exposures, including the dose levels which have been determined to be appropriate to be applied to those employees.

## **PART III**

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

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

- (a) the names or positions of persons authorised to set emergency procedures in motion and the person in charge of, and who will co-ordinate, the on-site mitigatory action;

- (b) the arrangements for receiving early warning of any radiation emergency;
- (c) the arrangements for the co-ordination of resources necessary to implement the off-site emergency plan;
- (d) the arrangements for the provision of assistance with on-site mitigatory action;
- (e) the arrangements for off-site mitigatory action;
- (f) the arrangements for the provision to the public of specific information in the event of a radiation emergency, including the facts of the emergency, the steps to be taken by the various authorities and, where appropriate, the health protection measures to be taken by the public themselves; and
- (g) the arrangements for permitting certain employees to receive emergency exposures, including the dose levels which have been determined to be appropriate to be applied to those employees.



## **SCHEDULE 8**

Regulations 7(3)(b) and (c),  
8(3)(b) and (c);  
and 9(2)(d) and (e).

### **PRINCIPLES AND PURPOSES OF INTERVENTION**

#### **PART I**

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

The principles to which emergency plans shall have regard referred to in regulations 7(3)(b), 8(3)(b) and 9(2)(d) are that-

- (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(3)(c), 8(3)(c) and 9(2)(e) are-

- (a) the reduction or stoppage at source of direct radiation and the emission of radionuclides;
- (b) the reduction of the transfer of radioactive substances from the environment to individuals;
- (c) the reduction of the exposure of persons to radiation and the organisation of the treatment of those who have been exposed to radiation.

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#### **SCHEDULE 9**

Regulation 16(1)

#### **PRIOR INFORMATION TO BE SUPPLIED TO MEMBERS OF THE PUBLIC AND TO BE 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.

**SCHEDULE 10**

Regulation 17(4)

**INFORMATION TO BE SUPPLIED TO MEMBERS OF THE  
PUBLIC 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. 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 shall 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 any 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.

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