
STATUTORY RULES OF NORTHERN IRELAND

2001 No. 436

HEALTH AND SAFETY

**Radiation (Emergency Preparedness and Public Information)
Regulations (Northern Ireland) 2001**

Made 20th December 2001

Coming into operation 4th February 2002

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The Department of Enterprise, Trade and Investment(**a**), being the Department concerned(**b**), in exercise of the powers (as respects regulations 1 to 16 and 18 to 22) conferred on it by Articles 17(1) to (5), 40(2) and 55(2) of, and paragraphs 2(1), 5, 7(1), 10, 13, 14(1) and 15 of Schedule 3 to, the Health and Safety at Work (Northern Ireland) Order 1978(**c**) and of every other power enabling it in that behalf and for the purpose of giving effect without modifications to proposals submitted to it by the Health and Safety Executive for Northern Ireland under Article 13(1A)(**d**) of that Order after the carrying out by the said Executive of consultations in accordance with Article 46(3)(**e**) of that Order, and (as respects regulations 17 and 21) under section 2(2) of the European Communities Act 1972(**f**) being a Department designated(**g**) for the purposes of the said section 2(2) both in relation to measures relating to informing the public about health protection measures to be taken in the event of a radiological emergency, and in relation to measures relating to the basic safety standards for the protection of the general public and workers against the dangers of ionising radiation and of all other powers enabling it in that behalf, hereby makes the following Regulations:—

Citation and commencement

1. These Regulations may be cited as the Radiation (Emergency Preparedness and Public Information) Regulations (Northern Ireland) 2001 and shall come into operation on 4th February 2002.

Interpretation

2.—(1) In these Regulations—

“the 1998 Regulations” means the Packaging, Labelling and Carriage of Radioactive Material by Rail Regulations (Northern Ireland) 1998(**h**);

(a) Formerly the Department of Economic Development; *see* S.I. 1999/283 (N.I. 1), Article 3(5)
 (b) *See* Article 2(2) of S.I. 1978/1039 (N.I. 9)
 (c) S.I. 1978/1039 (N.I. 9)
 (d) Article 13 was amended by S.I. 1998/2795 (N.I. 18), Article 4
 (e) Article 46(3) was amended by S.I. 1998/2795 (N.I. 18), Article 6(1) and Schedule 1, paragraphs 8 and 18(c)
 (f) 1972 c.68
 (g) S.I. 1991/2289
 (h) S.R. 1998 No. 132

“the 2000 Regulations” means the Ionising Radiations Regulations (Northern Ireland) 2000(a);

“approved dosimetry service” means an approved dosimetry service within the meaning of the 2000 Regulations and which is approved for the purpose of regulation 14 of these Regulations;

“carrier” shall be construed in accordance with paragraph (2);

“carrier’s emergency plan” shall be construed in accordance with regulation 8;

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

“the Department ” means the Department of Enterprise, Trade and Investment;

“dose assessment” means the dose assessment made and recorded by an approved dosimetry service in accordance with regulation 21 of the 2000 Regulations;

“dose record” means the record made and maintained in respect of an employee by the approved dosimetry service in accordance with regulation 21 of the 2000 Regulations;

“emergency exposure” means an exposure of an employee engaged in an activity of, or associated with, the response to a radiation emergency or potential radiation emergency in order to bring help to endangered persons, prevent exposure of a large number of persons or save a valuable installation or goods, whereby one of the individual dose limits referred to in paragraphs 1 or 2 of Part I of Schedule 4 to the 2000 Regulations could be exceeded;

“emergency services” means—

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

“the Executive” means the Health and Safety Executive for Northern Ireland;

“Health and Social Services Board” means a Health and Social Services Board established under Article 16 of the Health and Personal Social Services (Northern Ireland) Order 1972(b);

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

- (a) equipment, structures, pipework, machinery and tools,

(a) S.R. 2000 No. 375
(b) S.I. 1972/1265 (N.I. 14)

(b) railway sidings, docks and unloading quays serving the unit, and
(c) jetties, warehouses or similar structures, whether floating or not,
which are necessary for the operation of the unit;

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

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

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

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

“medical surveillance” means medical surveillance carried out in accordance with regulation 24 of the 2000 Regulations;

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

(a) a person for the time being present upon premises where a radiation emergency is reasonably foreseeable or where a radiation emergency has actually occurred, or

(b) a person engaged in an activity of or associated with the response to a radiation emergency;

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

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

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

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

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

“premises” means—

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

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

(b) where radioactive substances are present on a licensed site, that licensed site,

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

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

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

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

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

“transport” means—

(a) carriage of a radioactive substance by rail in or on a vehicle and a radioactive substance shall be deemed as being transported from the time that it is loaded onto the vehicle for the purpose of transporting it until it is unloaded from that vehicle;

(b) transferring or conveying a radioactive substance through any public place otherwise than—

(i) by rail, road, inland waterway, sea or air; or

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

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

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

(2) In these Regulations, any reference to a carrier is a reference to—

(a) an employer undertaking the transport by rail of any radioactive substance, and includes both a carrier for hire or reward and a carrier on own account, and

(b) an employer transferring or conveying a radioactive substance through any public place otherwise than by rail, road, inland waterway, sea or air or by means of a pipeline or similar means.

(3) In these Regulations, any reference to an operator is a reference to—

(a) in relation to any premises other than a licensed site, the person who is, in the course of a trade, business or other undertaking carried on by him, in control of the operation of premises, and

(b) in relation to a licensed site, the licensee,

and any duty imposed by these Regulations on the operator shall extend only in relation to those premises.

(4) In these Regulations, any reference to—

(a) an employer includes a reference to a self-employed person and any duty imposed by these Regulations on an employer in respect of his employee shall extend to a self-employed person in respect of himself;

(b) exposure to ionising radiation is a reference to exposure to ionising radiation arising from work with ionising radiation.

(5) The Interpretation Act (Northern Ireland) 1954^(a) shall apply to these Regulations as it applies to an Act of the Northern Ireland Assembly.

Application

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

(a) having on any premises or providing facilities for there to be on any premises a radioactive substance containing more than the quantity of any radionuclide specified in Schedule 2 or, in the case of fissile material, more than the mass of that material specified in Schedule 3;

(b) transporting by rail a radioactive substance containing more than the quantity of radionuclides specified in Schedule 4 or, in the case of fissile material, more than the mass of that material specified in Schedule 3; or

(c) transferring or conveying a radioactive substance of a quantity or mass referred to in sub-paragraph (b) through any public place otherwise than by rail, road, inland waterway, sea or air or by means of a pipeline or similar means.

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

(a) where only one radionuclide is involved, the quantity of that radionuclide exceeds the quantity specified in the appropriate entry in Part I of Schedule 2; or

(b) where more than one radionuclide is involved, the quantity ratio calculated in accordance with Part II of Schedule 2 exceeds one.

(a) 1954 c. 33 (N.I.)

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

- (a) where only one radionuclide is involved, the quantity of that radionuclide exceeds the quantity specified in the appropriate entry in Part I of Schedule 4; or
- (b) where more than one radionuclide is involved, the quantity ratio calculated in accordance with Part II of Schedule 4 exceeds one.

(4) These Regulations shall not apply in respect of—

- (a) except for the transport of such source, any non-dispersible source;
- (b) except for the transport of such substance, any radioactive substance which has an activity concentration of not more than 100 Bqg⁻¹;
- (c) any radioactive substance conforming to the specifications for special form radioactive material set out in the 1998 Regulations and which is certified pursuant to those Regulations as complying with them or where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1998 Regulations;
- (d) any radioactive substance which is in a package which complies in every respect with either the requirements for—
 - (i) a Type B package design within the meaning of the 1998 Regulations; or
 - (ii) a consignment shipped under Special Arrangement Transport Operations for the equivalent of a Type B package within the meaning of the 1998 Regulations,and which is, in either case, certified pursuant to those Regulations as complying with them or where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1998 Regulations;
- (e) the transport of any radioactive substance in the form of a low specific activity material conforming to the specifications for LSA-I, LSA-II or LSA-III within the meaning of the 1998 Regulations including cases where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1998 Regulations;
- (f) the transport of any radioactive substance in the form of a surface contaminated object conforming to the specifications for SCO-I or SCO-II within the meaning of the 1998 Regulations including cases where the transport forms part of an international transport operation as is referred to in regulation 2(3)(a), (b) or (c) of the 1998 Regulations; or
- (g) the presence of a radioactive substance while it is in or on the live body or corpse of a human being or animal where that presence occurs otherwise than in consequence of a radiation emergency.

Hazard identification and risk evaluation

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

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

which, in either case, is sufficient to demonstrate that—

- (c) all hazards arising from that work with the potential to cause a radiation accident have been identified; and
- (d) the nature and magnitude of the risks to employees and other persons arising from those hazards have been evaluated.

(2) Where the assessment made for the purposes of paragraph (1) or of regulation 5 shows that a radiation risk to employees or other persons exists from an identifiable radiation accident, the operator or carrier, as the case may be, shall take all reasonably practicable steps to—

- (a) prevent any such accident; and
- (b) limit the consequences of any such accident which does occur.

(3) The requirements of this regulation are without prejudice to the requirements of regulation 3 (Risk assessment) of the Management of Health and Safety at Work Regulations (Northern Ireland) 2000(a) and to regulation 7 (Prior risk assessment etc.) of the 2000 Regulations.

Review of hazard identification and risk evaluation

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

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

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

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

Reports of assessment

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

- (a) the operator in question shall send to the Executive a report of that assessment at least 12 months before the commencement of the work with ionising radiation to which the assessment relates or within such shorter time in advance as the Executive may agree; and
- (b) the carrier in question shall send to the Executive a report of that assessment at least 28 days before the commencement of the work with ionising radiation to which the assessment relates or within such shorter time in advance as the Executive may agree.

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

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

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

(5) The Executive may, for the purpose of assessing the risk to the health and safety of persons who could be affected by work with ionising radiation to which regulation 4 applies, require a detailed assessment of any of the matters set out in Schedule 6.

(6) For the purposes of the assessment referred to in paragraph (5), the Executive may by notice in writing served on the operator or carrier, require him to carry out (or in relation to a carrier, require him to ensure that there has been carried out) such detailed assessment of such matters as are specified in the notice and the operator or carrier, as the case may be, shall send a report of that assessment to the Executive within such time as is specified in the notice or within such longer time as the Executive may subsequently allow.

Operator's emergency plan

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

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

(3) A person shall not carry out work with ionising radiation to which the assessment made in accordance with regulation 4(1) applies unless—

- (a) the operator has complied with the requirements of paragraphs (1) and (2); and
- (b) the Executive has complied with the requirements of regulation 9(1), (2), (3), (9) and (10) and has provided confirmation of this to the operator in accordance with regulation 9(14).

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

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

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

- (a) his employees, any person carrying out work on behalf of the operator, the Executive, the emergency services, the Health and Social Services Board for the area in which the premises of the operator are situated and the Department of the Environment; and
- (b) such other persons, bodies and authorities as the operator considers appropriate,

and, in a case where the emergency services form part of the plan, shall give such information to those services as will enable them to perform their functions in accordance with the plan.

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

- (a) suitable and sufficient information, instruction and training; and
- (b) the equipment necessary to restrict that employee's exposure to ionising radiation including, where appropriate, the issue of suitable dosimeters or other devices obtained in either case from the approved dosimetry service with which the operator has entered into an arrangement under regulation 21 of the 2000 Regulations.

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

Carrier's emergency plan

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

radiation and the health and safety of persons who may be affected by such reasonably foreseeable emergencies as are identified by the said assessment.

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

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

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

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

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

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

- (a) the Executive, (where not also the carrier) the consignor and the Department of the Environment; and
- (b) such emergency services, Health and Social Services Boards and other persons, bodies or authorities (or in each case representatives thereof) as the carrier considers appropriate.

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

- (a) suitable and sufficient information, instruction and training; and
- (b) the equipment necessary to restrict that employee's exposure to ionising radiation including, where appropriate, suitable dosimeters or other devices obtained in either case from the approved dosimetry service with which the carrier has entered into an arrangement under regulation 21 of the 2000 Regulations.

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

Off-site emergency plan

9.—(1) The Executive shall arrange for the preparation of an adequate emergency plan (in these Regulations referred to as an "off-site emergency plan") for any premises at which there is carried out work with ionising radiation to which these Regulations apply, and in respect of which an assessment made by the operator pursuant to regulation 4(1) or regulation 5

shows that it is reasonably foreseeable that a radiation emergency might arise (having regard to the steps taken by the operator under regulation 4(2)).

(2) The off-site emergency plan shall be designed to secure, so far as is reasonably practicable, the restriction of exposure to ionising radiation and the health and safety of persons who may be affected by such reasonably foreseeable emergencies as are identified in the assessment referred to in paragraph (1) and the plan shall be prepared in respect of such area as in the opinion of the Executive any member of the public is likely to be affected by such radiation emergencies.

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

(4) The off-site emergency plan prepared pursuant to paragraphs (1) and (2) shall address each reasonably foreseeable radiation emergency that has been identified by the operator for the purposes of regulation 7(1).

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

(6) Without prejudice to paragraph (5), the operator shall further supply to the Executive—

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

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

(8) The operator shall, within 28 days of any further assessment or revision referred to in paragraph (6)(b) inform the Executive of any material change to the information supplied arising from that assessment or review.

(9) Subject to paragraph (10), the off-site emergency plan shall be prepared no later than 6 months (or such longer period as the Department may agree in writing) after the receipt by the Executive of the information referred to in paragraph (5).

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

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

(12) Without prejudice to the generality of paragraphs (1) and (2), the off-site emergency plan shall secure, where appropriate, intervention for the purposes set out in Part II of Schedule 8.

(13) For the purpose of preparing an off-site emergency plan pursuant to paragraphs (1) and (2) or of reviewing the plan pursuant to regulation 10(1), the Executive shall consult—

- (a) the operator carrying out the work with ionising radiation to which the plan relates, the emergency services, each Health and Social Services Board in the vicinity of the premises of the operator and the Department of the Environment; and
- (b) such other persons, bodies and authorities and members of the public as the Executive considers appropriate.

(14) Once the off-site emergency plan has been prepared, the Executive shall confirm in writing to the operator that such preparation has taken place.

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

- (a) suitable and sufficient information, instruction and training; and
- (b) the equipment necessary to restrict that employee's exposure to ionising radiation including, where appropriate, the issue of suitable dosimeters or other devices.

Review and testing of emergency plans

10.—(1) A person who has prepared, or arranged for the preparation of, an emergency plan pursuant to regulations 7, 8 or 9, as the case may be, shall at suitable intervals not exceeding 3 years—

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

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

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

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

Consultation and co-operation

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

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

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

Charge for preparation, review and testing of emergency plans

12.—(1) The Executive may charge—

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

(2) The fee charged under paragraph (1) shall not exceed the sum of costs reasonably incurred by the Executive in performing the functions referred to in that paragraph, including (but without prejudice to the generality of the foregoing provision of this paragraph) any costs reasonably incurred by the Executive 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 Executive shall send or give to the operator or carrier, as the case may be, a detailed statement of the work done and the costs incurred including the dates of any site visits and the period to which the statement relates; and the fee, which shall be recoverable only as a civil debt, shall become payable one month after the statement has been sent or given.

Implementation of emergency plans

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

- (a) a radiation emergency occurs, or

(b) an event occurs which could reasonably be expected to lead to a radiation emergency,

and shall notify such occurrence to the Executive without delay.

(2) Where the Executive has arranged for the preparation of an emergency plan pursuant to regulation 9, it shall take reasonable steps to ensure that the emergency plan, or such parts of it as are necessary, is put into effect without delay when informed by the operator that—

(a) a radiation emergency has occurred; or

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

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

(a) as soon as is reasonably practicable, make (or in relation to a carrier ensure that there has been made) a provisional assessment of the circumstances and consequences of such an emergency and for this purpose shall consult—

(i) in the case of the operator, the emergency services, the Executive, the Health and Social Services Board, the Department of the Environment and such other persons, bodies or authorities as have functions under the operator's emergency plan or the off-site emergency plan; and

(ii) in the case of the carrier, the consignor, the Department of the Environment and any emergency services and Health and Social Services Board who were involved in the response to the emergency and such other persons, bodies or authorities as have functions under the carrier's emergency plan;

(b) as soon as is practicable and in any event within 12 months or such longer time as the Executive may agree, make (or in relation to a carrier ensure that there has been made) a full assessment of the consequences of that emergency and the effectiveness of the emergency plans put into effect as a result of that emergency; and

(c) within 28 days of the completion of the assessment under subparagraph (b) make a report of the findings of the assessment and retain that report or a copy thereof for at least 50 years from the date upon which the report was completed.

(4) The operator or carrier shall provide to the Executive within 28 days of the making of the report under paragraph (3)(c) a copy of that report.

Emergency exposures

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

(a) identify those employees who may be subject to emergency exposures;

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

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

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

(4) In any case where in the opinion of the Executive the dose levels for emergency exposure notified pursuant to paragraph (2) or (3) are too high,

the operator or carrier shall, if so directed by the Executive, substitute such other dose level or levels as the Executive may consider appropriate.

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

- (a) that no employee of his under 18 years of age, no trainee under 18 years of age and no female employee who is pregnant or breastfeeding is subject to an emergency exposure;
- (b) that no other employee of his is subject to an emergency exposure unless—
 - (i) that employee has agreed to undergo such exposure;
 - (ii) the requirements of paragraph (1)(a) to (f) have been complied with in respect of that employee; and
 - (iii) that employee has been permitted to be so by an employee authorised for that purpose under paragraph (1)(g); and
- (c) that no employee of his involved in implementing an emergency plan is exposed to a dose of radiation in excess of the dose level determined in accordance with paragraphs (2), (3) or (4).

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

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

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

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

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

(10) In the event of a report made pursuant to regulation 13(3) relating to the circumstances of an emergency exposure and the action taken as a result of that exposure, an employer shall keep such report (or a copy thereof) until the person to whom the report relates has or would have attained the age of

75 years but in any event for at least 50 years from the termination of the work which involved any emergency exposure.

Disapplication of dose limits

15. In the event of a radiation emergency, regulation 11 of the 2000 Regulations shall not apply to intervention.

Prior information to the public

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

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

(b) make that information publicly available.

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

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

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

(a) at regular intervals but, in any case, not less than once in three years; and

(b) whenever significant changes to the emergency measures, action and authorities referred to in paragraphs 3, 4 and 5 of Schedule 9 take place.

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

(a) at intervals not exceeding three years; and

(b) if it is revised pursuant to paragraph (4), as soon as reasonably practicable after the revision.

(6) Where a report made pursuant to regulation 6 relates to an assessment which identifies any reasonably foreseeable radiation emergency, the operator or carrier, as the case may be, shall make such report available to the public as soon as is reasonably practicable after it has been sent to the Executive

under that regulation (except that, with the approval of the Executive, the operator or carrier need not make available any parts of such reports for reasons of industrial, commercial or personal confidentiality, public security or national defence).

Duty of Executive to supply information to the public in the event of a radiation emergency

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

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

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

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

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

Modifications relating to the Ministry of Defence etc.

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

(a) “visiting forces” is a reference to visiting forces within the meaning of any provision of Part 1 of the Visiting Forces Act 1952(a); and

(b) “headquarters or organisation” is a reference to a headquarters or organisation designated for the purposes of the International Headquarters and Defence Organisations Act 1964(b).

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

(a) Her Majesty’s Forces;

(b) visiting forces;

(c) any member of a visiting force working in or attached to any headquarters or organisation; or

(a) 1952 c. 67

(b) 1964 c. 5

(d) any person engaged in work with ionising radiation for, or on behalf of, the Secretary of State for Defence,

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

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

Enforcement and offences

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

- (a) 18 to 23 (approval of codes of practice and enforcement);
- (b) 25 (provisions supplementary to Articles 23 and 24) and 26 (appeal against improvement or prohibition notice), so far as they relate to an improvement notice;
- (c) 28 (power to indemnify inspectors); and
- (d) 31 to 39 (provisions as to offences),

of the Health and Safety at Work (Northern Ireland) Order 1978 shall apply to that provision as if that provision had been made under Article 17 of that Order.

Transitional provisions

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

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

- (a) an operator or carrier who is required to send a report of assessment to the Executive under regulation 6(1) shall be deemed to have complied with the requirements of that paragraph if such report is sent to the Executive within 5 months of that date or within such longer time as the Executive may agree;
- (b) an operator who is required to prepare an operator's emergency plan under regulation 7(1) and a carrier who is required to prepare a carrier's emergency plan under regulation 8(1) shall be deemed to have complied with the requirements of that paragraph if that plan is prepared within 6 months of that date or within such longer time as the Executive may agree, and in such case paragraph (3) of regulation 7 or 8 respectively and regulation 9(10) shall not apply;
- (c) an operator who is required to provide information to the Executive in accordance with the requirements of paragraph (5) of regulation 9

shall be deemed to have complied with that paragraph if he provides the required information to the Executive within 6 months of that date or within such longer time as the Executive may agree;

- (d) an operator or carrier who is required to notify the Executive of the determined dose levels under regulation 14(2) shall be deemed to have complied with the requirements of that regulation if such notification is given to the Executive within 5 months of that date or within such longer time as the Executive may agree; and
- (e) subject to paragraph (3), an operator or carrier who is required to supply information to the public pursuant to paragraph (1) of regulation 16 shall be deemed to have complied with that paragraph if the information specified in Schedule 9 is supplied within a reasonable time after preparation of the off-site emergency plan or the carrier's emergency plan, as the case may be.

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

Amendment of Regulations

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

Revocation and saving

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

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

(2) Paragraph (3) of regulation 41 of the 2000 Regulations^(b) is revoked.

(3) To the extent that it applies in relation to the transport of radioactive substances by road, inland waterway, sea or air, regulation 26 (Special hazard assessment) of the Ionising Radiations Regulations (Northern Ireland)

(a) S.R. 1992 No. 515 as amended by S.R. 1999 No. 150, regulation 2 and the Schedule.

(b) S.R. 2000 No. 375

1985(a) (in this paragraph referred to as “the 1985 Regulations”) shall continue in operation and, in respect of any employer subject to the said regulation 26, the following provisions shall also continue in operation—

- (a) paragraphs (1) to (3), (4)(b) and (c) and (5) of regulation 27 (Contingency plans) with the modification that—
 - (i) in paragraph (1), the reference to regulation 25(1) of the 1985 Regulations shall be treated as a reference to regulation 7(1) or (2) of the 2000 Regulations;
 - (ii) in paragraph (1)(b), the reference to regulation 8(1) of and Schedule 6 to the 1985 Regulations shall be treated as a reference to regulation 16 of the 2000 Regulations;
 - (iii) in paragraph (4)(b), the reference to regulation 13(2) of the 1985 Regulations shall be treated as a reference to regulation 21(2) of the 2000 Regulations;
- (b) any other provisions of the 1985 Regulations in so far as is necessary to give effect to the provisions specified in this paragraph.

Sealed with the Official Seal of the Department of Enterprise, Trade and Investment on 20th December 2001.

(L.S.)

Michael J. Bohill
A Senior Officer of the Department of
Enterprise, Trade and Investment

(a) S.R. 1985 No. 273, revoked (subject to a saving) by regulation 41 of the Ionising Radiation Regulations (Northern Ireland) 2000

**Doses of Ionising Radiation within the meaning of
“Radiation Emergency”**

1. An effective dose of 5 mSv in the period of one year immediately following the radiation emergency.
2. Without prejudice to paragraph 1—
 - (a) an equivalent dose for the lens of the eye of 15 mSv in the period of one year immediately following the radiation emergency; and
 - (b) an equivalent dose for the skin of 50 mSv in the period of one year immediately following the radiation emergency over 1cm² area of skin, regardless of the area exposed.
3. In this Schedule —
 - (a) any reference to an effective dose means the sum of the effective dose to the whole body from external radiation and the committed effective dose from internal radiation;
 - (b) any reference to equivalent dose to a human tissue or organ includes the committed equivalent dose to that tissue or organ from internal radiation;
 - (c) “external radiation” means, in relation to a person, ionising radiation coming from outside the body of that person; and
 - (d) “internal radiation” means, in relation to a person, ionising radiation coming from inside the body of that person.

Specified Quantities of Radionuclides on Premises

PART I

TABLE OF RADIONUCLIDES

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Actinium		
Ac-224		2 10 ¹¹
Ac-225		3 10 ⁹
Ac-226		2 10 ¹⁰
Ac-227		4 10 ⁷
Ac-228		5 10 ¹¹
Aluminium		
Al-26		7 10 ¹⁰
Americium		
Am-237		4 10 ¹²
Am-238		6 10 ¹²
Am-239		2 10 ¹²
Am-240		4 10 ¹²
Am-241		3 10 ⁸
Am-242		1 10 ¹²
Am-242m		3 10 ⁸
Am-243		3 10 ⁸
Am-244		2 10 ¹²
Am-244m		2 10 ¹⁴
Am-245		2 10 ¹²
Am-246		1 10 ¹²
Am-246m		2 10 ¹²
Antimony		
Sb-115		2 10 ¹²
Sb-116		2 10 ¹²
Sb-116m		2 10 ¹²
Sb-117		1 10 ¹³
Sb-118m		7 10 ¹²
Sb-119		1 10 ¹³
Sb-120	(long lived isotope)	3 10 ¹²
Sb-120	(short lived isotope)	2 10 ¹²
Sb-122		2 10 ¹²
Sb-124		4 10 ¹¹
Sb-124m		4 10 ¹²
Sb-125		4 10 ¹¹
Sb-126		1 10 ¹²
Sb-126m		2 10 ¹²
Sb-127		2 10 ¹²
Sb-128	(long lived isotope)	2 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Sb-128	(short lived isotope)	1 10 ¹²
Sb-129		2 10 ¹²
Sb-130		1 10 ¹²
Sb-131		2 10 ¹²
Argon		
Ar-37	(gas)	4 10 ¹⁷
Ar-39	(gas)	2 10 ¹⁶
Ar-41	(gas)	4 10 ¹³
Arsenic		
As-69		7 10 ¹¹
As-70		1 10 ¹²
As-71		3 10 ¹²
As-72		9 10 ¹¹
As-73		8 10 ¹²
As-74		2 10 ¹²
As-76		9 10 ¹¹
As-77		2 10 ¹²
As-78		7 10 ¹¹
Astatine		
At-207		4 10 ¹²
At-211		2 10 ¹¹
Barium		
Ba-126		2 10 ¹³
Ba-128		1 10 ¹³
Ba-131		6 10 ¹²
Ba-131m		3 10 ¹²
Ba-133		4 10 ¹¹
Ba-133m		2 10 ¹²
Ba-135m		2 10 ¹²
Ba-139		1 10 ¹²
Ba-140		2 10 ¹²
Ba-141		1 10 ¹²
Ba-142		2 10 ¹²
Berkelium		
Bk-245		3 10 ¹²
Bk-246		6 10 ¹²
Bk-247		3 10 ⁸
Bk-249		2 10 ¹¹
Bk-250		2 10 ¹²
Beryllium		
Be-7		2 10 ¹³
Be-10		6 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Bismuth		
Bi-200		2 10 ¹²
Bi-201		2 10 ¹²
Bi-202		3 10 ¹²
Bi-203		4 10 ¹²
Bi-205		2 10 ¹²
Bi-206		2 10 ¹²
Bi-207		1 10 ¹¹
Bi-210		2 10 ¹¹
Bi-210m		6 10 ⁹
Bi-212		7 10 ¹¹
Bi-213		7 10 ¹¹
Bi-214		1 10 ¹²
Bromine		
Br-74		8 10 ¹¹
Br-74m		6 10 ¹¹
Br-75		2 10 ¹²
Br-76		1 10 ¹²
Br-77		4 10 ¹³
Br-80		1 10 ¹²
Br-80m		5 10 ¹²
Br-82		3 10 ¹²
Br-83		2 10 ¹²
Br-84		7 10 ¹¹
Cadmium		
Cd-104		1 10 ¹³
Cd-107		4 10 ¹²
Cd-109		2 10 ¹²
Cd-113		2 10 ¹¹
Cd-113m		1 10 ¹¹
Cd-115		2 10 ¹²
Cd-115m		2 10 ¹²
Cd-117		2 10 ¹²
Cd-117m		2 10 ¹²
Caesium		
Cs-125		2 10 ¹²
Cs-127		1 10 ¹³
Cs-129		2 10 ¹³
Cs-130		2 10 ¹²
Cs-131		6 10 ¹³
Cs-132		9 10 ¹²
Cs-134		7 10 ¹⁰
Cs-134m		4 10 ¹²
Cs-135		9 10 ¹¹
Cs-135m		8 10 ¹²
Cs-136		8 10 ¹¹

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

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Cobalt		
Co-55		2 10 ¹²
Co-56		2 10 ¹¹
Co-57		1 10 ¹²
Co-58		6 10 ¹¹
Co-58m		2 10 ¹³
Co-60		6 10 ¹⁰
Co-60m		7 10 ¹²
Co-61		2 10 ¹²
Co-62m		9 10 ¹¹
Copper		
Cu-60		1 10 ¹²
Cu-61		2 10 ¹²
Cu-64		4 10 ¹²
Cu-67		3 10 ¹²
Curium		
Cm-238		5 10 ¹²
Cm-240		7 10 ⁹
Cm-241		5 10 ¹¹
Cm-242		4 10 ⁹
Cm-243		4 10 ⁸
Cm-244		4 10 ⁸
Cm-245		2 10 ⁸
Cm-246		2 10 ⁸
Cm-247		3 10 ⁸
Cm-248		7 10 ⁷
Cm-249		2 10 ¹²
Cm-250		1 10 ⁷
Dysprosium		
Dy-155		1 10 ¹³
Dy-157		1 10 ¹⁴
Dy-159		8 10 ¹²
Dy-165		2 10 ¹²
Dy-166		3 10 ¹²
Einsteinium		
Es-250		1 10 ¹³
Es-251		6 10 ¹²
Es-253		8 10 ⁹
Es-254		2 10 ⁹
Es-254m		5 10 ¹⁰
Erbium		
Er-161		6 10 ¹²
Er-165		2 10 ¹⁴
Er-169		3 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Er-171		2 10 ¹²
Er-172		3 10 ¹²
Europium		
Eu-145		4 10 ¹²
Eu-146		3 10 ¹²
Eu-147		4 10 ¹²
Eu-148		4 10 ¹¹
Eu-149		8 10 ¹²
Eu-150	(long lived isotope)	1 10 ¹¹
Eu-150	(short lived isotope)	2 10 ¹²
Eu-152		1 10 ¹¹
Eu-152m		2 10 ¹²
Eu-154		1 10 ¹¹
Eu-155		2 10 ¹²
Eu-156		2 10 ¹²
Eu-157		2 10 ¹²
Eu-158		1 10 ¹²
Fermium		
Fm-252		7 10 ¹⁰
Fm-253		6 10 ¹⁰
Fm-254		3 10 ¹¹
Fm-255		9 10 ¹⁰
Fm-257		3 10 ⁹
Fluorine		
F-18		2 10 ¹²
Francium		
Fr-222		1 10 ¹²
Fr-223		2 10 ¹²
Gadolinium		
Gd-145		2 10 ¹²
Gd-146		2 10 ¹²
Gd-147		5 10 ¹²
Gd-148		9 10 ⁸
Gd-149		6 10 ¹²
Gd-151		5 10 ¹²
Gd-152		1 10 ⁹
Gd-153		2 10 ¹²
Gd-159		2 10 ¹²
Gallium		
Ga-65		1 10 ¹²
Ga-66		9 10 ¹¹
Ga-67		5 10 ¹²
Ga-68		2 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Ga-70		1 10 ¹²
Ga-72		2 10 ¹²
Ga-73		2 10 ¹²
Germanium		
Ge-66		3 10 ¹²
Ge-67		7 10 ¹¹
Ge-68		1 10 ¹²
Ge-69		2 10 ¹²
Ge-71		7 10 ¹⁴
Ge-75		2 10 ¹²
Ge-77		1 10 ¹²
Ge-78		2 10 ¹²
Gold		
Au-193		7 10 ¹²
Au-194		1 10 ¹³
Au-195		3 10 ¹²
Au-198		2 10 ¹²
Au-198m		2 10 ¹²
Au-199		3 10 ¹²
Au-200		1 10 ¹²
Au-200m		2 10 ¹²
Au-201		2 10 ¹²
Hafnium		
Hf-170		4 10 ¹²
Hf-172		5 10 ¹¹
Hf-173		6 10 ¹²
Hf-175		2 10 ¹²
Hf-177m		2 10 ¹²
Hf-178m		4 10 ¹⁰
Hf-179m		2 10 ¹²
Hf-180m		2 10 ¹²
Hf-181		1 10 ¹²
Hf-182		7 10 ¹⁰
Hf-182m		2 10 ¹²
Hf-183		2 10 ¹²
Hf-184		2 10 ¹²
Holmium		
Ho-155		2 10 ¹²
Ho-157		4 10 ¹²
Ho-159		6 10 ¹²
Ho-161		1 10 ¹³
Ho-162		5 10 ¹²
Ho-162m		4 10 ¹²
Ho-164		2 10 ¹²
Ho-164m		4 10 ¹²

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

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
I-128		1 10 ¹²
I-128	(elemental vapour)	2 10 ¹⁴
I-128	(methyl iodide vapour)	5 10 ¹⁴
I-129		1 10 ¹⁰
I-129	(elemental vapour)	2 10 ¹¹
I-129	(methyl iodide vapour)	2 10 ¹¹
I-130		3 10 ¹²
I-130	(elemental vapour)	5 10 ¹²
I-130	(methyl iodide vapour)	6 10 ¹²
I-131		9 10 ¹⁰
I-131	(elemental vapour)	6 10 ¹¹
I-131	(methyl iodide vapour)	7 10 ¹¹
I-132		2 10 ¹²
I-132	(elemental vapour)	2 10 ¹³
I-132	(methyl iodide vapour)	3 10 ¹³
I-132m		2 10 ¹²
I-132m	(elemental vapour)	4 10 ¹³
I-132m	(methyl iodide vapour)	5 10 ¹³
I-133		2 10 ¹²
I-133	(elemental vapour)	2 10 ¹²
I-133	(methyl iodide vapour)	3 10 ¹²
I-134		2 10 ¹²
I-134	(elemental vapour)	3 10 ¹³
I-134	(methyl iodide vapour)	4 10 ¹³
I-135		2 10 ¹²
I-135	(elemental vapour)	9 10 ¹²
I-135	(methyl iodide vapour)	1 10 ¹³
Iridium		
Ir-182		1 10 ¹²
Ir-184		2 10 ¹²
Ir-185		3 10 ¹²
Ir-186	(long lived isotope)	3 10 ¹²
Ir-186	(short lived isotope)	2 10 ¹²
Ir-187		6 10 ¹²
Ir-188		5 10 ¹²
Ir-189		9 10 ¹²
Ir-190		2 10 ¹²
Ir-190m	(long lived isotope)	3 10 ¹²
Ir-190m	(short lived isotope)	1 10 ¹³
Ir-192		6 10 ¹¹
Ir-192m		4 10 ¹¹
Ir-193m		4 10 ¹²
Ir-194		1 10 ¹²
Ir-194m		1 10 ¹¹
Ir-195		2 10 ¹²
Ir-195m		2 10 ¹²
Iron		
Fe-52		2 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Fe-55		8 10 ¹²
Fe-59		8 10 ¹¹
Fe-60		4 10 ¹⁰
Krypton		
Kr-74	(gas)	5 10 ¹³
Kr-76	(gas)	1 10 ¹⁴
Kr-77	(gas)	6 10 ¹³
Kr-79	(gas)	2 10 ¹⁴
Kr-81	(gas)	7 10 ¹⁵
Kr-81m	(gas)	5 10 ¹⁴
Kr-83m	(gas)	3 10 ¹⁶
Kr-85	(gas)	1 10 ¹⁶
Kr-85m	(gas)	4 10 ¹⁴
Kr-87	(gas)	7 10 ¹³
Kr-88	(gas)	3 10 ¹³
Lanthanum		
La-131		2 10 ¹²
La-132		2 10 ¹²
La-135		2 10 ¹⁴
La-137		2 10 ¹²
La-138		2 10 ¹¹
La-140		2 10 ¹²
La-141		1 10 ¹²
La-142		1 10 ¹²
La-143		7 10 ¹¹
Lead		
Pb-195m		2 10 ¹²
Pb-198		4 10 ¹²
Pb-199		6 10 ¹²
Pb-200		3 10 ¹²
Pb-201		8 10 ¹²
Pb-202		6 10 ¹¹
Pb-202m		4 10 ¹²
Pb-203		9 10 ¹²
Pb-205		1 10 ¹³
Pb-209		2 10 ¹²
Pb-210		3 10 ⁹
Pb-211		2 10 ¹²
Pb-212		1 10 ¹¹
Pb-214		1 10 ¹²
Lutetium		
Lu-169		6 10 ¹²
Lu-170		3 10 ¹²
Lu-171		4 10 ¹²
Lu-172		3 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Lu-173		2 10 ¹²
Lu-174		1 10 ¹²
Lu-174m		3 10 ¹²
Lu-176		3 10 ¹¹
Lu-176m		2 10 ¹²
Lu-177		3 10 ¹²
Lu-177m		3 10 ¹¹
Lu-178		1 10 ¹²
Lu-178m		1 10 ¹²
Lu-179		2 10 ¹²
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Magnesium		
Mg-28		5 10 ¹²
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Manganese		
Mn-51		1 10 ¹²
Mn-52		2 10 ¹²
Mn-52m		8 10 ¹¹
Mn-53		1 10 ¹⁴
Mn-54		3 10 ¹¹
Mn-56		1 10 ¹²
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Mendelevium		
Md-257		9 10 ¹¹
Md-258		4 10 ⁹
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Mercury		
Hg-193	(organic)	3 10 ¹²
Hg-193	(inorganic)	3 10 ¹²
Hg-193	(vapour)	2 10 ¹³
Hg-193m	(organic)	2 10 ¹²
Hg-193m	(inorganic)	2 10 ¹²
Hg-193m	(vapour)	6 10 ¹²
Hg-194	(organic)	3 10 ¹¹
Hg-194	(inorganic)	1 10 ¹²
Hg-194	(vapour)	6 10 ¹¹
Hg-195	(organic)	5 10 ¹²
Hg-195	(inorganic)	5 10 ¹²
Hg-195	(vapour)	1 10 ¹³
Hg-195m	(organic)	3 10 ¹²
Hg-195m	(inorganic)	3 10 ¹²
Hg-195m	(vapour)	3 10 ¹²
Hg-197	(organic)	7 10 ¹²
Hg-197	(inorganic)	7 10 ¹²
Hg-197	(vapour)	5 10 ¹²
Hg-197m	(organic)	2 10 ¹²
Hg-197m	(inorganic)	2 10 ¹²
Hg-197m	(vapour)	4 10 ¹²
Hg-199m	(organic)	2 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Hg-199m	(inorganic)	$2 \cdot 10^{12}$
Hg-199m	(vapour)	$1 \cdot 10^{14}$
Hg-203	(organic)	$3 \cdot 10^{12}$
Hg-203	(inorganic)	$3 \cdot 10^{12}$
Hg-203	(vapour)	$3 \cdot 10^{12}$
Molybdenum		
Mo-90		$2 \cdot 10^{12}$
Mo-93		$2 \cdot 10^{12}$
Mo-93m		$4 \cdot 10^{12}$
Mo-99		$2 \cdot 10^{12}$
Mo-101		$2 \cdot 10^{12}$
Neodymium		
Nd-136		$4 \cdot 10^{12}$
Nd-138		$5 \cdot 10^{13}$
Nd-139		$2 \cdot 10^{12}$
Nd-139m		$3 \cdot 10^{12}$
Nd-141		$2 \cdot 10^{13}$
Nd-147		$2 \cdot 10^{12}$
Nd-149		$2 \cdot 10^{12}$
Nd-151		$1 \cdot 10^{12}$
Neon		
Ne-19	(gas)	$6 \cdot 10^{13}$
Neptunium		
Np-232		$3 \cdot 10^{12}$
Np-233		$2 \cdot 10^{14}$
Np-234		$5 \cdot 10^{12}$
Np-235		$2 \cdot 10^{13}$
Np-236	(long lived isotope)	$3 \cdot 10^9$
Np-236	(short lived isotope)	$3 \cdot 10^{12}$
Np-237		$5 \cdot 10^8$
Np-238		$2 \cdot 10^{12}$
Np-239		$1 \cdot 10^{12}$
Np-240		$7 \cdot 10^{11}$
Nickel		
Ni-56		$4 \cdot 10^{12}$
Ni-56	(carbonyl vapour)	$1 \cdot 10^{13}$
Ni-57		$2 \cdot 10^{12}$
Ni-57	(carbonyl vapour)	$2 \cdot 10^{13}$
Ni-59		$4 \cdot 10^{13}$
Ni-59	(carbonyl vapour)	$2 \cdot 10^{13}$
Ni-63		$1 \cdot 10^{13}$
Ni-63	(carbonyl vapour)	$1 \cdot 10^{13}$
Ni-65		$1 \cdot 10^{12}$
Ni-65	(carbonyl vapour)	$4 \cdot 10^{13}$

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

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Pt-197		$2 \cdot 10^{12}$
Pt-197m		$2 \cdot 10^{12}$
Pt-199		$2 \cdot 10^{12}$
Pt-200		$2 \cdot 10^{12}$
Plutonium		
Pu-234		$1 \cdot 10^{12}$
Pu-235		$2 \cdot 10^{13}$
Pu-236		$6 \cdot 10^8$
Pu-237		$1 \cdot 10^{13}$
Pu-238		$2 \cdot 10^8$
Pu-239		$2 \cdot 10^8$
Pu-240		$2 \cdot 10^8$
Pu-241		$1 \cdot 10^{10}$
Pu-242		$2 \cdot 10^8$
Pu-243		$2 \cdot 10^{12}$
Pu-244		$2 \cdot 10^8$
Pu-245		$2 \cdot 10^{12}$
Pu-246		$2 \cdot 10^{12}$
Polonium		
Po-203		$3 \cdot 10^{12}$
Po-205		$7 \cdot 10^{12}$
Po-206		$1 \cdot 10^{11}$
Po-207		$8 \cdot 10^{12}$
Po-208		$2 \cdot 10^9$
Po-209		$2 \cdot 10^9$
Po-210		$4 \cdot 10^9$
Potassium		
K-40		$2 \cdot 10^{12}$
K-42		$7 \cdot 10^{11}$
K-43		$2 \cdot 10^{12}$
K-44		$6 \cdot 10^{11}$
K-45		$9 \cdot 10^{11}$
Praseodymium		
Pr-136		$1 \cdot 10^{12}$
Pr-137		$2 \cdot 10^{12}$
Pr-138m		$2 \cdot 10^{12}$
Pr-139		$7 \cdot 10^{12}$
Pr-142		$1 \cdot 10^{12}$
Pr-142m		$2 \cdot 10^{15}$
Pr-143		$2 \cdot 10^{12}$
Pr-144		$2 \cdot 10^{12}$
Pr-145		$1 \cdot 10^{12}$
Pr-147		$1 \cdot 10^{12}$

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Promethium		
Pm-141		1 10 ¹²
Pm-143		9 10 ¹¹
Pm-144		2 10 ¹¹
Pm-145		3 10 ¹²
Pm-146		2 10 ¹¹
Pm-147		4 10 ¹²
Pm-148		1 10 ¹²
Pm-148m		5 10 ¹¹
Pm-149		2 10 ¹²
Pm-150		1 10 ¹²
Pm-151		2 10 ¹²
Protactinium		
Pa-227		3 10 ¹¹
Pa-228		3 10 ¹¹
Pa-230		3 10 ¹⁰
Pa-231		2 10 ⁸
Pa-232		2 10 ¹²
Pa-233		2 10 ¹²
Pa-234		5 10 ¹¹
Radium		
Ra-223		3 10 ⁹
Ra-224		7 10 ⁹
Ra-225		3 10 ⁹
Ra-226		2 10 ⁹
Ra-227		2 10 ¹²
Ra-228		1 10 ⁹
Rhenium		
Re-177		2 10 ¹²
Re-178		2 10 ¹²
Re-181		3 10 ¹²
Re-182	(long lived isotope)	2 10 ¹²
Re-182	(short lived isotope)	4 10 ¹²
Re-184		1 10 ¹²
Re-184m		7 10 ¹¹
Re-186		2 10 ¹²
Re-186m		1 10 ¹²
Re-187		5 10 ¹⁴
Re-188		1 10 ¹²
Re-188m		3 10 ¹²
Re-189		2 10 ¹²
Rhodium		
Rh-99		4 10 ¹²
Rh-99m		9 10 ¹²
Rh-100		4 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Rh-101		7 10 ¹¹
Rh-101m		2 10 ¹³
Rh-102		1 10 ¹¹
Rh-102m		6 10 ¹¹
Rh-103m		3 10 ¹⁵
Rh-105		2 10 ¹²
Rh-106m		2 10 ¹²
Rh-107		2 10 ¹²
Rubidium		
Rb-79		1 10 ¹²
Rb-81		2 10 ¹²
Rb-81m		4 10 ¹²
Rb-82m		3 10 ¹²
Rb-83		1 10 ¹²
Rb-84		1 10 ¹²
Rb-86		2 10 ¹¹
Rb-87		4 10 ¹²
Rb-88		5 10 ¹¹
Rb-89		9 10 ¹¹
Ruthenium		
Ru-94		1 10 ¹⁴
Ru-94	(tetroxide vapour)	1 10 ¹⁴
Ru-97		3 10 ¹³
Ru-97	(tetroxide vapour)	1 10 ¹⁴
Ru-103		2 10 ¹²
Ru-103	(tetroxide vapour)	1 10 ¹³
Ru-105		2 10 ¹²
Ru-105	(tetroxide vapour)	6 10 ¹³
Ru-106		3 10 ¹¹
Ru-106	(tetroxide vapour)	8 10 ¹¹
Samarium		
Sm-141		1 10 ¹²
Sm-141m		2 10 ¹²
Sm-142		9 10 ¹²
Sm-145m		3 10 ¹²
Sm-146		2 10 ⁹
Sm-147		3 10 ⁹
Sm-151		6 10 ¹²
Sm-153		2 10 ¹²
Sm-155		2 10 ¹²
Sm-156		2 10 ¹²
Scandium		
Sc-43		2 10 ¹²
Sc-44		2 10 ¹²
Sc-44m		9 10 ¹²

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

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

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Te-123		6 10 ¹²
Te-123	(vapour)	2 10 ¹²
Te-123m		2 10 ¹²
Te-123m	(vapour)	5 10 ¹²
Te-125m		2 10 ¹²
Te-125m	(vapour)	8 10 ¹²
Te-127		2 10 ¹²
Te-127	(vapour)	2 10 ¹⁴
Te-127m		1 10 ¹²
Te-127m	(vapour)	2 10 ¹²
Te-129		2 10 ¹²
Te-129	(vapour)	4 10 ¹⁴
Te-129m		1 10 ¹²
Te-129m	(vapour)	3 10 ¹²
Te-131		1 10 ¹²
Te-131	(vapour)	1 10 ¹⁴
Te-131m		2 10 ¹²
Te-131m	(vapour)	5 10 ¹²
Te-132		3 10 ¹²
Te-132	(vapour)	2 10 ¹²
Te-133		1 10 ¹²
Te-133	(vapour)	7 10 ¹³
Te-133m		1 10 ¹²
Te-133m	(vapour)	2 10 ¹³
Te-134		3 10 ¹²
Te-134	(vapour)	7 10 ¹³
Terbium		
Tb-147		2 10 ¹²
Tb-149		2 10 ¹²
Tb-150		2 10 ¹²
Tb-151		4 10 ¹²
Tb-153		7 10 ¹²
Tb-154		4 10 ¹²
Tb-155		1 10 ¹³
Tb-156		3 10 ¹²
Tb-156m	(long lived isotope)	1 10 ¹³
Tb-156m	(short lived isotope)	4 10 ¹²
Tb-157		1 10 ¹³
Tb-158		2 10 ¹¹
Tb-160		5 10 ¹¹
Tb-161		2 10 ¹²
Thallium		
Tl-194		1 10 ¹³
Tl-194m		2 10 ¹²
Tl-195		4 10 ¹²
Tl-197		5 10 ¹²
Tl-198		7 10 ¹²
Tl-198m		2 10 ¹²

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Tl-199		6 10 ¹²
Tl-200		1 10 ¹³
Tl-201		7 10 ¹²
Tl-202		7 10 ¹²
Tl-204		2 10 ¹²
Thorium		
Th-226		4 10 ¹¹
Th-227		2 10 ⁹
Th-228		6 10 ⁸
Th-229		1 10 ⁸
Th-230		2 10 ⁸
Th-231		2 10 ¹²
Th-232		2 10 ⁸
Th-234		3 10 ¹²
Thulium		
Tm-162		2 10 ¹²
Tm-166		3 10 ¹²
Tm-167		4 10 ¹²
Tm-170		2 10 ¹²
Tm-171		1 10 ¹³
Tm-172		2 10 ¹²
Tm-173		2 10 ¹²
Tm-175		2 10 ¹²
Tin		
Sn-110		6 10 ¹³
Sn-111		2 10 ¹²
Sn-113		5 10 ¹²
Sn-117m		3 10 ¹²
Sn-119m		5 10 ¹²
Sn-121		3 10 ¹²
Sn-121m		4 10 ¹²
Sn-123		2 10 ¹²
Sn-123m		2 10 ¹²
Sn-125		1 10 ¹²
Sn-126		5 10 ¹¹
Sn-127		2 10 ¹²
Sn-128		2 10 ¹²
Titanium		
Ti-44		2 10 ¹¹
Ti-45		2 10 ¹²
Tungsten		
W-176		5 10 ¹²
W-177		3 10 ¹²
W-178		6 10 ¹³

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
W-179		1 10 ¹³
W-181		1 10 ¹³
W-185		4 10 ¹²
W-187		2 10 ¹²
W-188		3 10 ¹²
Uranium		
U-230		2 10 ⁹
U-231		7 10 ¹²
U-232		6 10 ⁸
U-233		3 10 ⁹
U-234		3 10 ⁹
U-235		3 10 ⁹
U-236		3 10 ⁹
U-237		2 10 ¹²
U-238		3 10 ⁹
U-239		2 10 ¹²
U-240		2 10 ¹²
Vanadium		
V-47		1 10 ¹²
V-48		1 10 ¹²
V-49		2 10 ¹⁴
Xenon		
Xe-120	(gas)	1 10 ¹⁴
Xe-121	(gas)	3 10 ¹³
Xe-122	(gas)	1 10 ¹⁵
Xe-123	(gas)	9 10 ¹³
Xe-125	(gas)	2 10 ¹⁴
Xe-127	(gas)	2 10 ¹⁴
Xe-129m	(gas)	2 10 ¹⁵
Xe-131	(gas)	4 10 ¹⁵
Xe-133	(gas)	1 10 ¹⁵
Xe-133m	(gas)	2 10 ¹⁵
Xe-135	(gas)	2 10 ¹⁴
Xe-135m	(gas)	1 10 ¹⁴
Xe-138	(gas)	5 10 ¹³
Ytterbium		
Yb-162		1 10 ¹³
Yb-166		8 10 ¹²
Yb-167		4 10 ¹²
Yb-169		3 10 ¹²
Yb-175		4 10 ¹²
Yb-177		2 10 ¹²
Yb-178		2 10 ¹²

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

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

PART II

QUANTITY RATIOS FOR MORE THAN ONE RADIONUCLIDE

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

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

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

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. |

Specified Quantities for the Transport of Radionuclides

PART I

TABLE OF RADIONUCLIDES

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Actinium		
Ac-225	(see note 1)	6 10 ⁹
Ac-227	(see note 1)	9 10 ⁷
Ac-228		5 10 ¹¹
Aluminium		
Al-26		1 10 ¹¹
Americium		
Am-241		1 10 ⁹
Am-242m	(see note 1)	1 10 ⁹
Am-243	(see note 1)	1 10 ⁹
Antimony		
Sb-122		4 10 ¹¹
Sb-124		6 10 ¹¹
Sb-125		1 10 ¹²
Sb-126		4 10 ¹¹
Argon		
Ar-37		4 10 ¹³
Ar-39		2 10 ¹³
Ar-41		3 10 ¹¹
Arsenic		
As-72		3 10 ¹¹
As-73		4 10 ¹³
As-74		9 10 ¹¹
As-76		3 10 ¹¹
As-77		7 10 ¹¹
Astatine		
At-211	(see note 1)	5 10 ¹¹
Barium		
Ba-131	(see note 1)	2 10 ¹²
Ba-133		3 10 ¹²
Ba-133m		6 10 ¹¹
Ba-140	(see note 1)	3 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Berkelium		
Bk-247		8 10 ⁸
Bk-249	(see note 1)	3 10 ¹¹
Beryllium		
Be-7		2 10 ¹³
Be-10		6 10 ¹¹
Bismuth		
Bi-205		7 10 ¹¹
Bi-206		3 10 ¹¹
Bi-207		7 10 ¹¹
Bi-210		6 10 ¹¹
Bi-210m	(see note 1)	2 10 ¹⁰
Bi-212	(see note 1)	6 10 ¹¹
Bromine		
Br-76		4 10 ¹¹
Br-77		3 10 ¹²
Br-82		4 10 ¹¹
Cadmium		
Cd-109		2 10 ¹²
Cd-113m		5 10 ¹¹
Cd-115	(see note 1)	4 10 ¹¹
Cd-115m		5 10 ¹¹
Caesium		
Cs-129		4 10 ¹²
Cs-131		3 10 ¹³
Cs-132		1 10 ¹²
Cs-134		7 10 ¹¹
Cs-134m		6 10 ¹¹
Cs-135		1 10 ¹²
Cs-136		5 10 ¹¹
Cs-137	(see note 1)	6 10 ¹¹
Calcium		
Ca-41		unlimited
Ca-45		1 10 ¹²
Ca-47	(see note 1)	3 10 ¹¹
Californium		
Cf-248		6 10 ⁹
Cf-249		8 10 ⁸
Cf-250		2 10 ⁹
Cf-251		7 10 ⁸
Cf-252		3 10 ⁹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Cf-253 Cf-254	(see note 1)	4 10 ¹⁰ 1 10 ⁹
Carbon		
C-11 C-14		6 10 ¹¹ 3 10 ¹²
Cerium		
Ce-139 Ce-141 Ce-143 Ce-144	(see note 1)	2 10 ¹² 6 10 ¹¹ 6 10 ¹¹ 2 10 ¹¹
Chlorine		
Cl-36 Cl-38		6 10 ¹¹ 2 10 ¹¹
Chromium		
Cr-51		3 10 ¹³
Cobalt		
Co-55 Co-56 Co-57 Co-58 Co-58m Co-60		5 10 ¹¹ 3 10 ¹¹ 1 10 ¹³ 1 10 ¹² 4 10 ¹³ 4 10 ¹¹
Copper		
Cu-64 Cu-67		1 10 ¹² 7 10 ¹¹
Curium		
Cm-240 Cm-241 Cm-242 Cm-243 Cm-244 Cm-245 Cm-246 Cm-247 Cm-248	(see note 1)	2 10 ¹⁰ 1 10 ¹² 1 10 ¹⁰ 1 10 ⁹ 2 10 ⁹ 9 10 ⁸ 9 10 ⁸ 1 10 ⁹ 3 10 ⁸
Dysprosium		
Dy-159 Dy-165 Dy-166	(see note 1)	2 10 ¹³ 6 10 ¹¹ 3 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Erbium		
Er-169		1 10 ¹²
Er-171		5 10 ¹¹
Europium		
Eu-147		2 10 ¹²
Eu-148		5 10 ¹¹
Eu-149		2 10 ¹³
Eu-150	(long lived isotope)	7 10 ¹¹
Eu-150	(short lived isotope)	7 10 ¹¹
Eu-152		1 10 ¹²
Eu-152m		8 10 ¹¹
Eu-154		6 10 ¹¹
Eu-155		3 10 ¹²
Eu-156		7 10 ¹¹
Fluorine		
F-18		6 10 ¹¹
Gadolinium		
Gd-146	(see note 1)	5 10 ¹¹
Gd-148		2 10 ⁹
Gd-153		9 10 ¹²
Gd-159		6 10 ¹¹
Gallium		
Ga-67		3 10 ¹²
Ga-68		5 10 ¹¹
Ga-72		4 10 ¹¹
Germanium		
Ge-68	(see note 1)	5 10 ¹¹
Ge-71		4 10 ¹³
Ge-77		3 10 ¹¹
Gold		
Au-193		2 10 ¹²
Au-194		1 10 ¹²
Au-195		6 10 ¹²
Au-198		6 10 ¹¹
Au-199		6 10 ¹¹
Hafnium		
Hf-172	(see note 1)	6 10 ¹¹
Hf-175		3 10 ¹²
Hf-181		5 10 ¹¹
Hf-182		unlimited

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Holmium		
Ho-166		4 10 ¹¹
Ho-166m		5 10 ¹¹
Hydrogen		
H-3		4 10 ¹³
Indium		
In-111		3 10 ¹²
In-113m		2 10 ¹²
In-114m	(see note 1)	5 10 ¹¹
In-115m		1 10 ¹²
Iodine		
I-123		3 10 ¹²
I-124		1 10 ¹²
I-125		3 10 ¹²
I-126		1 10 ¹²
I-129		unlimited
I-131		7 10 ¹¹
I-132		4 10 ¹¹
I-133		6 10 ¹¹
I-134		3 10 ¹¹
I-135	(see note 1)	6 10 ¹¹
Iridium		
Ir-189	(see note 1)	1 10 ¹³
Ir-190		7 10 ¹¹
Ir-192		6 10 ¹¹
Ir-194		3 10 ¹¹
Iron		
Fe-52	(see note 1)	3 10 ¹¹
Fe-55		4 10 ¹³
Fe-59		9 10 ¹¹
Fe-60	(see note 1)	2 10 ¹¹
Krypton		
Kr-81		4 10 ¹³
Kr-85		1 10 ¹³
Kr-85m		3 10 ¹²
Kr-87		2 10 ¹¹
Lanthanum		
La-137		6 10 ¹²
La-140		4 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Lead		
Pb-201		1 10 ¹²
Pb-202		2 10 ¹³
Pb-203		3 10 ¹²
Pb-205		unlimited
Pb-210	(see note 1)	5 10 ¹⁰
Pb-212	(see note 1)	2 10 ¹¹
Lutetium		
Lu-172		6 10 ¹¹
Lu-173		8 10 ¹²
Lu-174		9 10 ¹²
Lu-174m		1 10 ¹³
Lu-177		7 10 ¹¹
Magnesium		
Mg-28	(see note 1)	3 10 ¹¹
Manganese		
Mn-52		3 10 ¹¹
Mn-53		unlimited
Mn-54		1 10 ¹²
Mn-56		3 10 ¹¹
Mercury		
Hg-194	(see note 1)	1 10 ¹²
Hg-195m	(see note 1)	7 10 ¹¹
Hg-197		1 10 ¹³
Hg-197m		4 10 ¹¹
Hg-203		1 10 ¹²
Molybdenum		
Mo-93		2 10 ¹³
Mo-99	(see note 1)	6 10 ¹¹
Neodymium		
Nd-147		6 10 ¹¹
Nd-149		5 10 ¹¹
Neptunium		
Np-235		4 10 ¹³
Np-236	(long lived isotope)	2 10 ¹⁰
Np-236	(short lived isotope)	2 10 ¹²
Np-237		2 10 ⁹
Np-239		4 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Nickel		
Ni-59		unlimited
Ni-63		$3 \cdot 10^{13}$
Ni-65		$4 \cdot 10^{11}$
Niobium		
Nb-93m		$3 \cdot 10^{13}$
Nb-94		$7 \cdot 10^{11}$
Nb-95		$1 \cdot 10^{12}$
Nb-97		$6 \cdot 10^{11}$
Nitrogen		
N-13		$6 \cdot 10^{11}$
Osmium		
Os-185		$1 \cdot 10^{12}$
Os-191		$2 \cdot 10^{12}$
Os-191m		$3 \cdot 10^{13}$
Os-193		$6 \cdot 10^{11}$
Os-194	(see note 1)	$3 \cdot 10^{11}$
Palladium		
Pd-103	(see note 1)	$4 \cdot 10^{13}$
Pd-107		unlimited
Pd-109		$5 \cdot 10^{11}$
Phosphorus		
P-32		$5 \cdot 10^{11}$
P-33		$1 \cdot 10^{12}$
Platinum		
Pt-188	(see note 1)	$8 \cdot 10^{11}$
Pt-191		$3 \cdot 10^{12}$
Pt-193		$4 \cdot 10^{13}$
Pt-193m		$5 \cdot 10^{11}$
Pt-195m		$5 \cdot 10^{11}$
Pt-197		$6 \cdot 10^{11}$
Pt-197m		$6 \cdot 10^{11}$
Plutonium		
Pu-236		$3 \cdot 10^9$
Pu-237		$2 \cdot 10^{13}$
Pu-238		$1 \cdot 10^9$
Pu-239		$1 \cdot 10^9$
Pu-240		$1 \cdot 10^9$
Pu-241	(see note 1)	$6 \cdot 10^{10}$
Pu-242		$1 \cdot 10^9$
Pu-244	(see note 1)	$1 \cdot 10^9$

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Polonium		
Po-210		2 10 ¹⁰
Potassium		
K-40		9 10 ¹¹
K-42		2 10 ¹¹
K-43		6 10 ¹¹
Praseodymium		
Pr-142		4 10 ¹¹
Pr-143		6 10 ¹¹
Promethium		
Pm-143		3 10 ¹²
Pm-144		7 10 ¹¹
Pm-145		1 10 ¹³
Pm-147		2 10 ¹²
Pm-148m	(see note 1)	7 10 ¹¹
Pm-149		6 10 ¹¹
Pm-151		6 10 ¹¹
Protactinium		
Pa-230	(see note 1)	7 10 ¹⁰
Pa-231		4 10 ⁸
Pa-233		7 10 ¹¹
Radium		
Ra-223	(see note 1)	7 10 ⁹
Ra-224	(see note 1)	2 10 ¹⁰
Ra-225	(see note 1)	4 10 ⁹
Ra-226	(see note 1)	3 10 ⁹
Ra-228	(see note 1)	2 10 ¹⁰
Radon		
Rn-222	(see note 1)	4 10 ⁹
Rhenium		
Re-184		1 10 ¹²
Re-184m		1 10 ¹²
Re-186		6 10 ¹¹
Re-187		unlimited
Re-188		4 10 ¹¹
Re-189	(see note 1)	6 10 ¹¹
Re-natural		unlimited

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Rhodium		
Rh-99		2 10 ¹²
Rh-101		3 10 ¹²
Rh-102		5 10 ¹¹
Rh-102m		2 10 ¹²
Rh-103m		4 10 ¹³
Rh-105		8 10 ¹¹
Rubidium		
Rb-81		8 10 ¹¹
Rb-83	(see note 1)	2 10 ¹²
Rb-84		1 10 ¹²
Rb-86		5 10 ¹¹
Rb-87		unlimited
Rb-natural		unlimited
Ruthenium		
Ru-97		5 10 ¹²
Ru-103	(see note 1)	2 10 ¹²
Ru-105		6 10 ¹¹
Ru-106	(see note 1)	2 10 ¹¹
Samarium		
Sm-145		1 10 ¹³
Sm-147		unlimited
Sm-151		1 10 ¹³
Sm-153		6 10 ¹¹
Scandium		
Sc-44		5 10 ¹¹
Sc-46		5 10 ¹¹
Sc-47		7 10 ¹¹
Sc-48		3 10 ¹¹
Selenium		
Se-75		3 10 ¹²
Se-79		2 10 ¹²
Silicon		
Si-31		6 10 ¹¹
Si-32		5 10 ¹¹
Silver		
Ag-105		2 10 ¹²
Ag-108m	(see note 1)	7 10 ¹¹
Ag-110m	(see note 1)	4 10 ¹¹
Ag-111		6 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Sodium		
Na-22		5 10 ¹¹
Na-24		2 10 ¹¹
Strontium		
Sr-82	(see note 1)	2 10 ¹¹
Sr-85		2 10 ¹²
Sr-85m		5 10 ¹²
Sr-87m		3 10 ¹²
Sr-89		6 10 ¹¹
Sr-90	(see note 1)	3 10 ¹¹
Sr-91	(see note 1)	3 10 ¹¹
Sr-92	(see note 1)	3 10 ¹¹
Sulphur		
S-35		3 10 ¹²
Tantalum		
Ta-178	(long lived isotope)	8 10 ¹¹
Ta-179		3 10 ¹³
Ta-182		5 10 ¹¹
Technetium		
Tc-95m	(see note 1)	2 10 ¹²
Tc-96		4 10 ¹¹
Tc-96m	(see note 1)	4 10 ¹¹
Tc-97		unlimited
Tc-97m		1 10 ¹²
Tc-98		7 10 ¹¹
Tc-99		9 10 ¹¹
Tc-99m		4 10 ¹²
Tellurium		
Te-121		2 10 ¹²
Te-121m		3 10 ¹²
Te-123m		1 10 ¹²
Te-125m		9 10 ¹¹
Te-127		7 10 ¹¹
Te-127m	(see note 1)	5 10 ¹¹
Te-129		6 10 ¹¹
Te-129m	(see note 1)	4 10 ¹¹
Te-131m	(see note 1)	5 10 ¹¹
Te-132	(see note 1)	4 10 ¹¹
Terbium		
Tb-157		4 10 ¹³
Tb-158		1 10 ¹²
Tb-160		6 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Thallium		
Tl-200		9 10 ¹¹
Tl-201		4 10 ¹²
Tl-202		2 10 ¹²
Tl-204		7 10 ¹¹
Thorium		
Th-227		5 10 ⁹
Th-228	(see note 1)	1 10 ⁹
Th-229		5 10 ⁸
Th-230		1 10 ⁹
Th-231		2 10 ¹⁰
Th-232		unlimited
Th-234	(see note 1)	3 10 ¹¹
Th-natural		unlimited
Thulium		
Tm-167		8 10 ¹¹
Tm-170		6 10 ¹¹
Tm-171		4 10 ¹³
Tin		
Sn-113	(see note 1)	2 10 ¹²
Sn-117m		4 10 ¹¹
Sn-119m		3 10 ¹³
Sn-121m	(see note 1)	9 10 ¹¹
Sn-123		6 10 ¹¹
Sn-125		4 10 ¹¹
Sn-126	(see note 1)	4 10 ¹¹
Titanium		
Ti-44	(see note 1)	4 10 ¹¹
Tungsten		
W-178	(see note 1)	5 10 ¹²
W-181		3 10 ¹³
W-185		8 10 ¹¹
W-187		6 10 ¹¹
W-188	(see note 1)	3 10 ¹¹
Uranium		
U-230	(fast lung absorption, see notes 1 and 2)	1 10 ¹¹
U-230	(medium lung absorption, see notes 1 and 3)	4 10 ⁹
U-230	(slow lung absorption, see notes 1 and 4)	3 10 ⁹
U-232	(fast lung absorption, see note 2)	1 10 ¹⁰

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
U-232	(medium lung absorption, see note 3)	7 10 ⁹
U-232	(slow lung absorption, see note 4)	1 10 ⁹
U-233	(fast lung absorption, see note 2)	9 10 ¹⁰
U-233	(medium lung absorption, see note 3)	2 10 ¹⁰
U-233	(slow lung absorption, see note 4)	6 10 ⁹
U-234	(fast lung absorption, see note 2)	9 10 ¹⁰
U-234		2 10 ¹⁰
U-234	(medium lung absorption, see note 3)	6 10 ⁹
U-235	(slow lung absorption, see note 4)	unlimited
U-236	(all lung absorption types, see notes 1, 2, 3 and 4)	unlimited
U-236	(fast lung absorption, see note 2)	2 10 ¹⁰
U-236	(medium lung absorption, see note 3)	6 10 ⁹
U-238	(slow lung absorption, see note 4)	unlimited
U-natural	(all lung absorption types, see notes 2, 3 and 4)	unlimited
U (enriched to 20% or less)		unlimited
U-depleted	(see note 5)	unlimited
Vanadium		
V-48		4 10 ¹¹
V-49		4 10 ¹³
Xenon		
Xe-122	(see note 1)	4 10 ¹¹
Xe-123		7 10 ¹¹
Xe-127		2 10 ¹²
Xe-131m		4 10 ¹³
Xe-133		1 10 ¹³
Xe-135		2 10 ¹²
Ytterbium		
Yb-169		1 10 ¹²
Yb-175		9 10 ¹¹
Yttrium		
Y-87	(see note 1)	1 10 ¹²
Y-88		4 10 ¹¹
Y-90		3 10 ¹¹
Y-91		6 10 ¹¹
Y-91m		2 10 ¹²
Y-92		2 10 ¹¹
Y-93		3 10 ¹¹
Zinc		
Zn-65		2 10 ¹²
Zn-69		6 10 ¹¹
Zn-69m	(see note 1)	6 10 ¹¹

<i>Radionuclide name, symbol</i>	<i>Radionuclide form</i>	<i>Quantity (Bq)</i>
Zirconium		
Zr-88		3 10 ¹²
Zr-93		unlimited
Zr-95	(see note 1)	8 10 ¹¹
Zr-97	(see note 1)	4 10 ¹¹
Other radionuclides not listed above where only beta or gamma emitting nuclides are known to be present	(see note 6)	2 10 ¹⁰
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 ⁷

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 UF₆, UO₂F₂ and UO₂(NO₃)₂ in both normal and accident condition of transport.

Note 3: These values apply only to compounds of uranium that take the chemical form of O₃, UF₄, UCL₄ and hexavalent compounds other than those specified in both normal and accident conditions of transport.

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

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

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

PART II

QUANTITY RATIOS FOR MORE THAN ONE RADIONUCLIDE

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

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

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

Particulars to be Included in an Assessment Report

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

- (a) the name and address of the operator or carrier;
- (b) the postal address of the premises where the radioactive substance will be processed, manufactured, used or stored, or where the facilities for processing, manufacture, use or storage exist or, in the case of transport, the postal address of the transport undertaking;
- (c) the date on which it is anticipated that the work with ionising radiation will commence or, if it has already commenced, a statement to that effect;
- (d) a general description of the premises or place including the geographical location, meteorological, geological, hydrographic conditions and, where material, the history of the premises, except that in the case of transport a general description shall be given of either—
 - (i) the starting and end points of the journeys and transhipment points, or
 - (ii) the criteria to be used for route selection;
- (e) in the case of an assessment by an operator, a description of any radioactive substance on the premises which is likely to exceed any quantity or mass specified in Schedule 2 or Schedule 3 as the case may be, which description shall where practicable include details of the radionuclides present and their likely maximum quantities;
- (f) in the case of an assessment by a carrier, a description of any radioactive substance which is likely to exceed any quantity or mass specified in Schedule 4 or Schedule 3 as the case may be, which description shall where practicable include details of the radionuclides present and their likely maximum quantities;
- (g) except in the case of an assessment relating to transport, a plan of the premises in question and a map of the environs to a scale large enough to enable the premises and any features which could affect the general risk in an emergency to be identified;
- (h) a diagram and description of any single plant or enclosed system containing more than the quantity or mass of any radioactive substance specified in Schedule 2 or Schedule 3, as the case may be, or, in the case of the transport of more than the quantity or mass of any radioactive substance specified in Schedule 4 or Schedule 3, as the case may be, the nature of the containment for the radioactive substance, the type of vehicle and the means of securing the load within or on the vehicle;
- (i) those factors which could precipitate a major release of any radioactive substance and the measures to be taken to prevent or control such release and information showing the maximum quantity of radioactive substance which, in the event of a major failure of containment, would be released to the atmosphere including, in respect of premises, the identification of plant and other activities anywhere on the premises which could precipitate such release;
- (j) those factors which could precipitate a smaller but continuing release of any radioactive substance and the measures to be taken to prevent or control such releases to atmosphere;

- (k) those factors which could give rise to an incident involving the initiation of an unintended self-sustaining nuclear chain reaction or the loss of control of an intended self-sustaining nuclear chain reaction and, in either case, the measures to be taken to prevent or control any such incident;
- (l) information concerning the management systems and staffing arrangements by which the radioactive substance is controlled and by which the procedures are controlled;
- (m) except in the case of an assessment relating to transport, information about the size and distribution of the population in the vicinity of premises to which the report relates;
- (n) an assessment of the area which is likely to be affected by the dispersal of any radioactive substance as a result of any radiation emergency and the period of time over which such dispersal is likely to take place;
- (o) an assessment of the likely exposures to ionising radiation of any person or class of persons as a result of any radiation emergency; and
- (p) an assessment of the necessity for an emergency plan to be prepared by the operator or carrier.

Further Particulars that the Executive may require

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

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

Information to be included in Emergency Plans

PART I

INFORMATION TO BE INCLUDED IN AN OPERATOR'S EMERGENCY PLAN

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

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

PART II

INFORMATION TO BE INCLUDED IN A CARRIER'S EMERGENCY PLAN

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

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

PART III

INFORMATION TO BE INCLUDED IN AN OFF-SITE EMERGENCY PLAN

The information referred to in regulation 9(3) is as follows:—

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

SCHEDULE 8 Regulations 7(4) and (5); 8(5)
and (6); and 9(11) and (12)

Principles and purposes of intervention

PART I

PRINCIPLES TO WHICH EMERGENCY PLANS SHALL HAVE REGARD

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

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

PART II

PURPOSES OF INTERVENTION

The purposes of intervention referred to in regulations 7(5), 8(6) and regulation 9(12) are—

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

Prior information to be supplied and made publicly available

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

Information to be supplied in the event of a Radiation Emergency

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

Amendment of Regulations*Fire Certificates (Special Premises) Regulations (Northern Ireland) 1991*

1. For paragraph 13 of Schedule 1 to the Fire Certificates (Special Premises) Regulations (Northern Ireland) 1991**(a)** there shall be substituted—

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

Ionising Radiations Regulations (Northern Ireland) 2000

2. The 2000 Regulations shall be amended in accordance with paragraphs 3 to 7.

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

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

“Enforcement

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

- (a) 18 to 23 (approval of codes of practice and enforcement);
- (b) 25 (provisions supplementary to Articles 23 and 24) and 26 (appeal against improvement or prohibition notice), so far as they relate to an improvement notice;
- (c) 28 (power to indemnify inspectors); and
- (d) 31 to 39 (provisions as to offences), of the Health and Safety at Work (Northern Ireland) Order 1978 shall apply to that provision as if that provision had been made under Article 17 of that Order.”.

5. After paragraph (6) of regulation 36 there shall be inserted the following paragraph—

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

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

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

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland) 1997

8. In Schedule 7 of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland) 1997**(b)**—

(a) S.R. 1991 No. 446

(b) S.R. 1997 No. 455

- (a) in Column 1 for the words “Ionising Radiations Regulations (Northern Ireland) 1985” there shall be substituted “Ionising Radiations Regulations (Northern Ireland) 2000”;
- (b) in Column 1 after the final entry there shall be added: “Radiation (Emergency Preparedness and Public Information) Regulations (Northern Ireland) 2001.”;
- (c) in Column 2 for the words “S.R. 1985 No. 273” there shall be substituted “S.R. 2000 No. 375”; and
- (d) in Column 2 after the final entry there shall be added: “S.R. 2001 No. 436.”.

EXPLANATORY NOTE

(This note is not part of the Regulations.)

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

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

The Regulations—

- (a) impose a duty on the operator and carrier to make an assessment as to hazard identification and risk evaluation and, where the assessment reveals a radiation risk, to take all reasonably practicable steps to prevent a radiation accident or limit the consequences should such an accident occur (*regulation 4*);
- (b) impose a duty on the operator and carrier to send the Executive a report of an assessment containing specified matters at specified times and empower the Executive to require a detailed assessment of such further particulars as it may reasonably require (*regulation 6 and Schedules 5 and 6*);
- (c) impose a duty on the operator and carrier to make a further assessment following a major change to the work with ionising radiation or within 3 years of the date of the last assessment, unless there has been no change of circumstances which would affect the last report of the assessment, and send the Executive a report of that further assessment (*regulations 5 and 6*);
- (d) where an assessment reveals a reasonably foreseeable radiation emergency arising, impose a duty on the operator or carrier (as the case may be) and, in the case of an operator, the Executive, to prepare, or in the case of the Executive, to arrange the preparation of, emergency plans (*regulations 7, 8 and 9 and Schedules 7 and 8*);
- (e) require operators, carriers and the Executive to review, revise and test emergency plans at suitable intervals not exceeding 3 years (*regulation 10*);
- (f) make provision as to consultation and co-operation by operators, carriers, employers and the Executive (*regulation 11*);

- (g) make provision as to charging by the Executive for performing its functions under the Regulations in relation to emergency plans (*regulation 12*);
- (h) in the event of the occurrence of a radiation emergency or of an event which could reasonably be expected to lead to such an emergency, make provision as to the implementation of emergency plans, and, in the event of the occurrence of a radiation emergency, the making of both provisional and final assessments as to the circumstances and consequences of the emergency (*regulation 13*);
- (i) where an emergency plan provides for the possibility of an employee receiving an emergency exposure, impose a duty on the employer to undertake specified arrangements for employees who may be subject to exposures, such as dose assessments, medical surveillance and the determination of appropriate dose levels, and impose further duties on employers in the event that an emergency plan is implemented (*regulation 14*);
- (j) impose requirements on operators and carriers, where an operator or carrier carries out work with ionising radiation which could give rise to a reasonably foreseeable radiation emergency, and on the Executive, to supply specified information to the public (*regulations 16 and 17 and Schedules 9 and 10*);
- (k) empower the Secretary of State for Defence to issue certificates of exemption to persons from specified classes in the interests of national security (*regulation 18*);
- (l) make certain amendments to the Ionising Radiations Regulations (Northern Ireland) 1985, the Fire Certificates (Special Premises) Regulations (Northern Ireland) 1991, the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland) 1997 and the Ionising Radiations Regulations (Northern Ireland) 2000 and, subject to savings, revoke the Public Information for Radiation Emergencies Regulations (Northern Ireland) 1992 (*regulations 21 and 22*); and
- (m) contain transitional provisions (*regulation 20*).

In Great Britain, the corresponding Regulations are the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (S.I. 2001/2975). The Great Britain Health and Safety Executive has prepared a regulatory impact assessment in relation to those Regulations and a copy of that assessment together with a Northern Ireland Supplement prepared by the Health and Safety Executive for Northern Ireland is held at the offices of that Executive at 83 Ladas Drive, Belfast BT6 9FR from where a copy may be obtained on request.

A person who contravenes the Regulations is guilty of an offence under Article 31 of the Health and Safety at Work (Northern Ireland) Order 1978 and is liable, on summary conviction, to a fine not exceeding the statutory maximum (currently £5,000) or, on conviction on indictment, to a fine.

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