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Work with Ionising Radiation

The Radiation (Emergency Preparedness and Public Information) Regulations 2019

Approved Code of Practice and Guidance

[Pre-consultation draft subject to change]

This draft of the Approved Code of Practice and Guidance is based on Draft 24 of REPPIR 2019

VERSION 3.1

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Approved Code of Practice

This Code has been approved by the Health and Safety Executive, with the consent of the Secretary of State. It gives practical information on how to comply with the law. If you follow this code you will be doing enough to comply with the law in respect of those specific matters on which the Code gives advice. You may use alternative methods to those set out in the Code in order to comply with the law.

However, the Code has a special legal status. If you are prosecuted for breach of health and safety law, and it is proved that you did not follow the relevant provisions of the Code, you will need to show that you have complied with the law in some other way or a Court will find you at fault.

Guidance

The Regulations and Approved Code of Practice (ACOP) are accompanied by guidance. Following the guidance is not compulsory and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

Presentation

The ACOP text is set out in bold, the accompanying guidance is in normal type, and the text of the Regulations is in italics. Coloured borders also indicate each section clearly.

Contents

Introduction

About this Publication

1. This publication has been produced to set out the Regulations, Approved Code of Practice (ACOP) and guidance on the requirements of the Radiation (Emergency Preparedness and Public Information) Regulations 2019. Its aim is to establish a framework for the protection of the public and workers from and in the event of radiation emergencies that originate from premises. It also provides advice to those who are involved in planning communication strategies.

2. This publication is intended for use by duty holders. The format is designed to clearly distinguish between the Regulations, the ACOP and the guidance. It should be read in conjunction with and supplemented by other available guidance including the National Nuclear Emergency Planning and Response Guidance (NNEPRG).

Reasons for change

3. The 2013 Basic Safety Standards Directive[1] (referred to as BSSD within this publication) brings five directives:
    - Basic Safety Standards Directive 96/29/ European Atomic Energy Community (Euratom);
    - Medical Exposures Directive 97/43/Euratom;
    - Outside Workers Directive 90/641/Euratom;
    - Control of high-activity sealed radioactive sources and orphan sources 2003/122/Euratom; and
    - Public Information Directive 89/618/Euratom,

    and an EU commission recommendation (Radon Commission Recommendation 90/143/Euratom) into one Directive. It reflects important lessons learned from the Fukushima Daiichi incident, as well as the recent standards agreed at the International Atomic Energy Agency (IAEA) and International Commission on Radiological Protection (ICRP).

4. The BSSD lays down requirements for protection against the dangers arising from exposure to ionising radiation. The aims of the Directive are to ensure:
    - minimum standards for protection against ionising radiation are introduced across all Member States;
    - duty holders minimise so far as is reasonably practicable, the risks from ionising radiation to which workers, the public and others may be exposed; and
    - risks from ionising radiation are controlled.

5. On 21st May 2019, the Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR) replaced REPPIR 2001 and are the primary means through which the nuclear emergency preparedness and response elements of the BSSD are transposed into UK law.

6. REPPIR 2019 is made under the Health and Safety at Work etc. Act 1974[2] (the 1974 Act).

Changes introduced by REPPIR 2019

7. The significant changes are summarised below and have been widely consulted on. They include:
    - Removal of interpretations, schedules and references associated with transport activities. The Carriage of Dangerous Goods Regulations 2009, as amended in 2019 (CDG), implements the BSSD requirements for emergency arrangements for the transport of radioactive material. However, Regulation 22 relates to emergencies (however they may arise) which includes reference to transport emergencies;
    - Modification of the definition of radiation emergency and removal of reference to ‘radiation accidents’;
    - Introduction of the term emergency worker;
    - Compared to the thresholds in REPPIR 2001, Schedule 1 includes additional radionuclides, revised scenarios and new modelling assumptions. The masses of fissile material in Schedule 2 are derived from their potential to produce a criticality accident; these values are unchanged from the corresponding Schedule 3 values in REPPIR 2001.
    - The previous exemption under REPPIR 2001 Regulation 3(4) (g) (see below) are not included in REPPIR 2019 and so the provisions of REPPIR 2019 now apply:

(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.

- Removal of references to 'reasonably foreseeable' radiation emergency and strengthening of the requirements for operators to assess all hazards arising from work undertaken which have the potential to cause a radiation emergency;
- Introduction of a revised risk assessment framework and consequence assessment methodology;
- Changes to the requirements for hazard evaluation and consequences assessment;
- A shift of responsibility for determining the detailed emergency planning zone to the local authority;
- Introduction of outline planning zones;
- Introduction of a proportionate and graded approach to planning for radiation emergencies;
- Removal of the requirement to separately determine prior information areas and a shift in the responsibility for the distribution of prior information to the local authority;
- Strengthening of the requirement for all local authorities to have in place arrangements to obtain and supply information to the public in the event of a radiation emergency, including those relating to transport of nuclear or radioactive material.
- Limitation of the disapplication of dose limits to emergency workers;
- Introduction of reference levels; and
- Introduction of the requirement to consult a Radiation Protection Adviser (RPA) on specific matters.

Scope of the revised Regulations

8. Regulation 3 of REPPIR sets out the scope of application of the Regulations. REPPIR places duties on operators and local authorities to plan for and manage the consequences from radiation emergencies arising from work with ionising radiation. These duties are placed on premises on which there is a radioactive substance containing more than the quantity of any radionuclide set out in Schedule 1, or, in the case of fissile material, more than the mass of the fissile material, as set out in Schedule 2.

9. If radioactive substances are handled and stored, even temporarily, at ports and airports, the places where they are stored are regarded as premises and REPPIR 2019 will apply if sufficient quantities are involved.

10. REPPIR regulation 22 (Duty of local authority to supply information to the public in the event of a radiation emergency) is applicable to ALL local authorities, irrespective of the rest of REPPIR.

11. Regulation 25 of REPPIR (Modifications relating to the Ministry of Defence) allows the Secretary of State for Defence to exempt specified personnel from all or any of the requirements or prohibitions imposed by REPPIR.

12. Duty holders under REPPIR 2001 and those who were excluded from REPPIR 2001 may not be excluded from REPPIR 2019 as thresholds for quantities of radionuclides and mass of fissile material have, in some instances, reduced. Duty holders should determine whether REPPIR applies, which regulations they need to comply with and ensure compliance.

13. These Regulations apply in Great Britain. Northern Ireland publishes separate regulations.

14. Throughout the process described in REPPIR of identifying hazards through to developing an emergency plan, accepted international good practice including international standards and guidance should be considered.

15. For a nuclear licensed site regulated under the Nuclear Installations Act 1965 (NIA), some of the requirements of REPPIR are already addressed by existing nuclear site licence conditions (eg the licensee implementing the emergency plan is covered by the emergency arrangements). REPPIR will not replace existing nuclear site licence conditions but compliance with the conditions should satisfy equivalent provisions in REPPIR.

16. There are some direct links between REPPIR and the 2017 Regulations, for example, regulation 18 of REPPIR on emergency exposures, and regulations 22, 24 and 25 of the 2017 Regulations on dose assessment, dose recording, dosimetry for accidents and medical surveillance. The terminology used in REPPIR is closely aligned to that in the 2017 Regulations. The 2017 Regulations use the term radiation accident which refers to any accident where immediate action would be required to prevent or reduce the exposure to ionising radiation

of employees or any other persons. A radiation emergency as defined in REPPIR is an event relating to serious consequences and is therefore a subset of radiation accidents.

17. Emergency arrangements made under REPPIR need to dovetail with those framework arrangements made under the Civil Contingencies Act (CCA).

18. REPPIR does not apply in the case of security events, however, emergency plans made under REPPIR should work together with plans made to provide protection against security events.

Hazard evaluation and consequence assessment

19. Regulation 4 provides that the operator must carry out an evaluation of the hazards arising from the work undertaken on the premises to determine whether they have the potential to cause a radiation emergency. Where they have that potential, regulation 4 requires operators to undertake protective action.

20. Regulation 5 provides that, where an operator has identified the potential for a radiation emergency pursuant to its evaluation, the operator must make a further assessment in accordance with Schedule 3 to evaluate a full range of consequences of such a radiation emergency.

21. Regulation 6 provides that, where the operator proposes a material change in its work with ionising radiation, or where a material change occurs, the operator must undertake review of its evaluation in accordance with regulation 4 and either make a further assessment in accordance with regulation 5 or make a declaration that the change of circumstances which triggered the review would not affect the last evaluation.

22. Regulation 7 requires the operator to send a consequences report to the local authority, which includes a proposed minimum geographical extent from the premises for emergency planning, and must offer an opportunity to discuss those consequences with the local authority.

Emergency planning areas

23. In order to plan for emergencies, it is necessary to identify the areas for which planning is required. Regulation 8 places a duty on the local authority to determine the detailed emergency planning zone taking into account the operator's proposal and other factors specific to the local authority's area.

24. The determination of outline planning zones on certain sites is set out in Regulation 9. Outline planning supplements detailed planning providing mitigation against unforeseen events. Outline planning builds on existing planning capabilities providing preparedness for low probability events up to and including unforeseen events.

Emergency plans

25. Regulation 10 provides that the operator is responsible for preparing an adequate emergency plan where the evaluation under regulation 4 shows that a radiation emergency may arise. Regulation 11 provides that, where there is either a detailed emergency planning zone, an outline planning zone, or both, the local authority must prepare an adequate off-site emergency plan to mitigate the consequences of a radiation emergency outside the operator's premises. Regulation 12 makes provision for the review, revision and testing of both the operator's emergency plan and the local authority's off-site emergency plan. At least once every three years, the operator's emergency plan and the off-site emergency plan must be reviewed and tested. If any findings that could affect the emergency response are identified during testing or review, which are relevant to the arrangements set out in the emergency plan, the plan must be revised.

26. An emergency plan is a document, or set of documents, that explains how a radiation emergency; or an event which might lead to a radiation emergency will be managed. It describes roles and responsibilities and may be supplemented by more detailed documents such as detailed event specific guidance. Emergency plans should be produced with the aim of keeping the radiation exposure of workers and the public that might occur in such events, as low as reasonably practicable. A proportionate and graded approach to planning will ensure that the emergency management system is able to effectively respond to the impact of a wide range of radiation emergencies. The operator's emergency plan and the off-site emergency plan should be complementary where both exist and dovetail to offer protection to the public in the event a full range of radiation emergencies.

27. An emergency plan should specify responses for the phases of a radiation emergency. The first few hours after the emergency starts is the 'critical' phase during which the effectiveness of the response can have the greatest effect. This is when key decisions, which will greatly affect the success of any protective action, should be made within a short period of time and when those responsible will be under the most pressure. Therefore, emergency plans should contain detail on the protective action which can be put in place to enable people who might have a role in emergency response to work in a timely and effective manner. The emergency plans should also specify the action to be taken to ensure a smooth transition to the recovery phase. The recovery phase should begin at the earliest opportunity following the onset of an emergency, running alongside the response. Elements of recovery should therefore be included in the plan to ensure a smooth transition and the plan should dovetail with recovery plans.

28. The operator's emergency plan is the responsibility of the operator and the off-site emergency plan is the responsibility of the lead local authority. As duty holders, each has the duty to ensure that plans are prepared and are adequate and fit for purpose.

29. Regulation 21 requires the local authority, in cooperation with the operator, to ensure that prior information is provided to the public in the detailed emergency planning zone where appropriate and is made accessible to the public in an outline planning zone. Regulation 22 requires information to be provided to the public in the event of an emergency. Regulation 22 applies to all local authorities whether or not they have premises in their area to which REPPIR applies.

Co-operation and consultation

30. Regulation 13 provides for cooperation between the operator and the local authority in fulfilling their duties to prepare emergency plans. There is guidance to assist in ensuring that the off-site plan and the operators plan dovetail with one another. The ACOP and guidance describes the arrangements that should be agreed, recorded and put in place between the local authority and the operator to ensure that there are open communication channels during an emergency.

31. Regulation 14 provides for cooperation between local authorities in the making and testing of off-site emergency plans. This regulation provides for the case where a lead local authority requires assistance from another local authority to make and test its off-site emergency plan if, for example, protective action is required for persons situated in the jurisdiction of that other local authority.

32. Regulation 15 provides for cooperation between operators and other employers on the same premises. It requires operators and employers on their premises that work with radioactive material to work together to ensure that the operator can fulfil its duties under the Regulations. Similarly, the regulation requires local authorities and employers with duties under the off-site emergency plan to work together to establish and maintain a suitable and sufficient plan. To do this the regulation puts duties on all organisations.

33. All organisations with a role in responding to a radiation emergency should be involved, as appropriate, in the preparation of emergency plans. Nominated representatives of these organisations should be invited to attend a multi-agency forum or group to develop plans and participate in tests.

34. Regulation 16 provides that a local authority may charge the operator reasonable costs for performing its core duties under REPPIR.

35. Regulation 24 also requires that every employer engaged with work with ionising radiation must consult a suitable RPA with regard to preparedness and response in emergency exposure situations.

Implementation

36. Regulation 17 sets out when operators and local authorities should implement their emergency plans and who should be informed about that implementation. A radiation emergency begins when the decision is taken by the operator to make a declaration of such and inform the local authority of its need to begin implementation of its off-site emergency plan. Timely implementation of emergency response is a key determinant of averting the worst-case outcome of a radiation emergency.

Emergency exposures

37. Regulation 18 provides that training and equipment should be provided to employees by their employer where there is the possibility of that employee receiving an emergency exposure of ionising radiation and makes further provision for employees where an emergency plan is put into place. Regulation 19 disapplies regulation 12 of the Ionising Radiations Regulations 2017 to an emergency worker who is engaged in preventing or mitigating the consequences of a radiation emergency.

38. Emergency exposures are exposures incurred by emergency workers, who take action to bring help to endangered people, prevent exposure of a large number of people, prevent harm to the environment or save valuable property, plant or goods. Such exposures are permitted to exceed statutory dose limits but only for pre-identified authorised personnel who have received appropriate information and training and are appropriately equipped.

39. Regulation 18 extends reference to the term "emergency worker", in certain circumstances to include persons or organisations who assist in the management of a radiation emergency on a voluntary basis. A volunteer from a voluntary organisation may be classed as an emergency worker if they have a defined role in the emergency plan and are given appropriate training. Although only the courts can give an authoritative interpretation of law, in considering the application of these Regulations and ACOP to volunteers working under another's direction, account should be taken of section 3 of the Health and Safety at Work Act 1974 (HSWA) which places general duties of employers and self-employed persons other than their employees.

40. Regulation 20 provides that the operator's emergency plans and the local authority's off-site emergency plans must prioritise reducing doses to emergency workers below 100mSv, or in exceptional circumstances below 500 mSv. Reference levels are recorded in emergency plans (and notified to the regulator under regulation 18). When the response to a radiation emergency is underway, reference levels may be revised or introduced for specific tasks. Specific reference levels may also be determined by the local authority upon advice from the person coordinating the off-site response to that emergency. In exceptional circumstances, the reference level may be set in excess of 100 mSv, but not exceeding 500 mSv.

[1] Council Directive 2013/59/EURATOM of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom *Official Journal of the European Union* (17.1.2014), No L13, 1-73.

[1] Health and Safety at Work etc Act Ch 37 The Stationary Office 1974 ISBN 0 10 543774

2019 No. 0000

HEALTH AND SAFETY

The Radiation (Emergency Preparedness and Public Information) Regulations 2019

Made - - - -	***
Laid before Parliament	***
Coming into force - -	*22nd May 2019*

The Secretary of State makes these Regulations in exercise of the powers conferred by sections 15(1) and (1B), (2), (3)(a), (4), (5), 18(2)(za), and 43(2) and (4) of, and paragraphs 6, 8(1), 11, 13(2), 14, 15, 16, and 20 of Schedule 3 to, the Health and Safety at Work etc. Act 1974([1]) ("the 1974 Act").

The Secretary of State makes these Regulations independently of any proposals made by the Health and Safety Executive, as provided by section 50(1)(b) of the 1974 Act having consulted, in accordance with section 50(1AA)([2]) of that Act, the Executive, the Office for Nuclear Regulation and such other persons as appeared to the Secretary of State to be appropriate.

([1]) 1974 c. 37. Section 15(1) was substituted by paragraph 6 of Schedule 15 to the Employment Protection Act 1975 (c. 71) and amended by S.I. 2002/794. Section 15(1B) was inserted by, and (2) and (3)(c) amended by, paragraph 5 of Schedule 12 to the Energy Act 2013 (c. 32). Section 15(4)(a) was amended by S.I. 2008/960. Section 18(2)(za) was inserted by paragraph 6 of Schedule 12 to the Energy Act 2013. Section 43(6) was substituted by paragraph 12 of Schedule 15 to the Employment Protection Act 1975 and amended by S.I. 2002/794.

([2]) Section 50 was amended by paragraph 11 of Schedule 12 to the Energy Act 2013 and article 16 of S.I. 2008/960.

Regulation 1	**Citation, commencement and extent**
Regulation 1	*(1) These Regulations may be cited as the Radiation (Emergency Preparedness and Public Information) Regulations 2019 and come into force on the 22nd May 2019.* *(2) These Regulations do not extend to Northern Ireland.*

Regulation 2	**Interpretation**
Regulation 2(1)	*(1) In these Regulations, unless the context otherwise requires—* *"the 2017 Regulations" means the Ionising Radiations Regulations 2017([3]);* *"the Agency" in relation to premises or a plan relating to premises—* *a) in England, means the Environment Agency,* *b) in Wales, means Natural Resources Body for Wales, and* *c) in Scotland, means the Scottish Environment Protection Agency;* *"approved dosimetry service" means an approved dosimetry service within the meaning of the 2017 Regulations and which is approved for the purpose of regulation 22 of those Regulations;* *"authorised defence site" has the meaning given by regulation 2(1) of the Health and Safety (Enforcing Authority) Regulations 1998([4]);* *"Category 1 responder" has the meaning set out in Parts 1, 2 and 2A of Schedule 1 to the Civil Contingencies Act 2004([5]);* *"Category 2 responder" has the meaning set out in Parts 3, 4 and 5 of Schedule 1 to the Civil Contingencies Act 2004([6])* *"consequences report" has the meaning set out in regulation 7(1);*

([3]) S.I. 2017/1075.

([4]) S.I. 1998/494. The reference to authorised defence site was introduced by paragraph 72 of Part 3 of Schedule 3 to S.I. 2014/469.

([5]) 2004 c. 36. Paragraph 1A was inserted by article 2 of S.I. 2011/1233. Parts 1 and 2 of Schedule 1 have also been amended by paragraph 27 of Schedule 1 to the National Health Service (Consequential Provisions) Act 2006 (c. 43), section 312 of and Part 8 of Schedule 22 to the Marine and Coastal Access Act 2009 (c. 23), paragraph 132 of Schedule 5, paragraph 16 of Schedule 7 and paragraph 100 of Part 2 of Schedule 14 to the Health and Social Care Act 2012 (c. 7), article 2 of S.I. 2008/3012, paragraph 429 of Part 1 of Schedule 2 to S.I. 2013/755, and paragraph 1 of Part 1 of Schedule 3 to S.S.I. 2013/119. Part 2A of Schedule 1 was inserted by article 41 of S.I. 2018/644.

([6]) Parts 3 and 4 of Schedule 1 have been amended by paragraph 132 of Schedule 5 to the Health and Social Care Act 2012, paragraph 16 of Schedule 9 to the Civil Aviation Act 2012 (c.19), paragraph 81 of Part 5 of Schedule 12 to the Energy Act 2013, paragraph 152 of Part 2 of Schedule 1 to the Infrastructure Act 2015 (c. 7), article 2 of S.I. 2005/2043, paragraph 4 of Part 1 of Schedule 1 to S.I. 2005/3050, paragraph 6 of Part 1 of Schedule 1 to S.I. 2016/645, and article 41 of S.I. 2018/644. Part 5 of Schedule 1 was inserted by article 41 of S.I. 2018/644.

	"detailed emergency planning zone" means a zone determined in accordance with regulation 8 and covered by the local authority's off-site emergency plan; *"dose" means, in relation to ionising radiation, any dose or sum of dose quantities to which an individual is exposed as a result of a radiation emergency;* *"dose assessment" means the dose assessment made and recorded by an approved dosimetry service in accordance with regulation 22 of the 2017 Regulations;* *"dose record" means the record made and maintained in respect of an employee by the approved dosimetry service in accordance with regulation 22 of the 2017 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 other persons or save a valuable installation or goods, whereby one of the individual dose limits referred to in paragraphs 1 and 2 of Part 1 of Schedule 3 to the 2017 Regulations could be exceeded;*
Guidance 2(1)	1 The dose limits in the 2017 Regulations referred to in the definition of emergency exposure are those applicable to employees of 18 years of age or above. Emergency exposures are exposures which exceed these dose limits and are incurred by emergency workers.
Regulation 2(1)	*"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, and* *b) where appropriate, Her Majesty's Coastguard;* *"emergency worker" means any person who has a defined responding role in an operator's emergency plan or a local authority's off-site emergency plan, and who might be exposed to radiation as a result of a potential or actual radiation emergency;*
Guidance 2(1)	2 An emergency worker is someone who is likely to be exposed to radiation while taking action in response to an emergency and has a defined role in an emergency plan. A volunteer from a voluntary organisation may be classed as an emergency worker if they have a defined role in the emergency plan and have been given appropriate training, however, a member of the public volunteering their services on the day of an emergency would not. People providing assistance to the handling of the radiation emergency but unlikely to be exposed to radiation arising from the radiation emergency (i.e. people located remote to the site) are not considered to be emergency workers.
Regulation 2(1)	*"existing exposure situation" means an exposure situation which does not call or no longer calls for the implementation of any protective action from an emergency plan;*
Guidance 2(1)	3 When the state is returned to an existing exposure situation the situation is no longer in an emergency phase and has transitioned to the recovery phase or beyond.
Regulation 2(1)	*"health authority" means—* *(a) in relation to England, a clinical commissioning group established under section 14D of the National Health Service Act 2006*([7])*,* *(b) in relation to Wales, means a local health board established under section 11 of the National Health Service (Wales) Act 2006(a), and* *(c) in relation to Scotland, a health board established under section 2 of the National Health Service (Scotland) Act 1978*([8])*;*

([7]) 2006 c. 41. Section 14D was inserted by section 25 of the Health and Social Care Act 2012
([8]) 2006 c. 42.

	"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, and* *(b) docks, unloading quays, jetties, warehouses or similar structures, whether floating or not;*
Regulation 2(1)	*"ionising radiation" means the energy transferred in the form of particles or electromagnetic waves of a wavelength of 100 nanometres or less or a frequency of 3 x 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;* *"local authority" means in relation to—* *(a) London, the London Fire Commissioner,* *(b) an area where there is a Metropolitan County Fire and Rescue Authority, that authority,* *(c) the Isles of Scilly, the Council of the Isles of Scilly,* *(d) an area in the rest of England, the county council for that area, or, where there is no county council for that area, the district council for that area,* *(e) an area in Scotland, the council for the local government area, and* *(f) an area in Wales, the county council or the county borough council for that area*;
Guidance 2(1)	4 Local authorities have duties in connection with determining the detailed emergency planning zone (regulation 8), the preparation, review, revision, testing and implementation of off-site emergency plans (regulations 11, 12 and 17) and in making arrangements to supply information prior to and in the event of an radiation emergency (regulations 21 and 22). 5 In England, the local authority will be the relevant County Council, Unitary Authority or Metropolitan Fire & Rescue Service for Metropolitan District areas. In London, the local authority duty is discharged by the London Fire Commissioner on behalf of the London Mayor. In Scotland and Wales, the local authority will be the relevant council. 6 Where the ACOP and guidance refers to a "lead local authority", this is the local authority as defined in regulation 7(3) and in which the relevant premises resides.
Regulation 2(1)	*"medical surveillance" means medical surveillance carried out in accordance with the 2017 Regulations;* *"new nuclear build site" has the meaning given by regulation 2A of the Health and Safety (Enforcing Authority) Regulations 1998[(9)];* *"non-dispersible source" means a sealed source or a radioactive substance which in either case, it is determined that by virtue of its physical and chemical form cannot cause a radiation emergency but does not include any radioactive substance that is or has been a component of a nuclear reactor;*
Guidance 2(1)	7 A non-dispersible source may be any radioactive source that can be shown, by physical testing and/or by assessment, to retain the radioactive material following fire damage, mechanical or chemical trauma or from a combination of these factors and any others that are representative of the effects of any non-routine situation or event. 8 Operators who work solely with radioactive substances that have physical and chemical properties that render them incapable of significant dispersal during any non-routine situation or event can carry out a non-dispersibility assessment to make the

(9) Regulation 2A was inserted by paragraph 73 of Part 3 of Schedule 3 to S.I. 2014/469.

	case that further duties under these Regulations are not required. See the ACOP and guidance for regulation 3 for details of how the assessment should be carried out. **Radioactive materials that cannot be considered as non-dispersible** 9 The following cannot be considered as 'non-dispersible' and are outside the scope of regulation 3(5)(a) of these Regulations: • a nuclear fuel element or the remains of a nuclear fuel element following degradation or processing, • defueled reactor vessels, nor their component parts, or • radioactive waste, either in its raw state, after processing or after immobilisation.
Regulation 2(1)	*"nuclear site licence" has the meaning assigned to it by section 1(1) of the Nuclear Installations Act 1965(**c**);* *"nuclear warship site" has the meaning given by regulation 2B of the Health and Safety (Enforcing Authority) Regulations 1998([10]);* *"off-site emergency plan" is to be interpreted in accordance with regulation 11;* *"operator" has the meaning set out in paragraph (2);* *"operator's emergency plan" are to be interpreted in accordance with regulation 10;* *"outline planning zone" means a zone determined in accordance with regulation 9 and covered by the local authority's off-site emergency plan;* *"premises" means—* *(a) the whole of an area under the control of an operator where radioactive substances are present in one or more installations, and for this purpose two or more areas under the control of the operator and separated only by a road, railway or inland waterway shall be treated as one whole area, or* *(b) where radioactive substances are present on a licensed site, that licensed site, or* (c) *where a radioactive substance forms an integral part of a vessel and is used in connection with the operation of that vessel, includes when that vessel is at fixed point moorings or alongside berths, save that such a vessel is to be deemed 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;*

([10]) Regulation 2B was inserted by paragraph 73 of Part 3 of Schedule 3 to S.I. 2014/469.

Guidance 2(1)	10 Premises constitute one or more installations, such as buildings or facilities where radioactive substances are produced, used, handled or stored. Such buildings or facilities may be served by, for example, railway sidings within nuclear licensed sites, or jetties/quays at ports, and where such railway sidings or jetties/quays are considered as part of those particular installations. Container parks at ports would also count as installations or premises in their own right. **Hospitals and universities** 11 Hospital and university campuses are single premises. Separate facilities in which work with ionising radiation is undertaken on such campuses under the overall control of the hospital or university administration, such as independently-funded research units, are installations within those premises. Only separate facilities that are physically located on the campus but are completely outside the control of the hospital or university administration, such as a completely independent science park with its own separate administration, should be considered as separate premises. Individual hospital or university buildings that are not located on a campus are separate premises, except where two or more buildings are co-located (separated only by a right of way such as a road), where such co-located buildings would together form a single premises. **Industrial complexes** 12 An industrial complex under the control of one person is a single premises, and would cover all facilities run by all employers on the complex. Only facilities which are on the industrial complex but which are completely outside the control of the industrial complex administration should be considered as separate premises. **Ports and airports** 13 At ports and airports, all co-located areas within the port or airport (separated only by, for example, a road or railway) under the control of the same person together form one premises. A particular person may, therefore, have more than one premises within a port or airport if the areas under the control of that person are remote from one another (eg transit sheds). 14 Once Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR) quantities (see Schedules 1 and 2) of radioactive substances have been unloaded from a ship or aircraft onto the quayside or tarmac they should be treated as part of the premises and the person in control of the premises (usually on which they are handled and stored) is responsible for any relevant REPPIR assessments and emergency plans. Therefore, the interface between transport and premises is the point at which the radioactive substance has been unloaded, or loaded. 15 When the radioactive substances are moved (eg by fork-lift truck) from the point of unloading to a storage site, if the quayside/tarmac and storage site are controlled by the same person, they would constitute one premises and would both need to be covered by the same assessment and emergency plan. 16 If the quayside/tarmac was controlled by another person, REPPIR would apply to both operators for the two separate premises. If the quayside/tarmac was a public place or a road, the Carriage of Dangerous Goods Regulations 2009, as amended in 2019 (CDG) would apply until the radioactive material was unloaded at the storage site. 17 Whatever radioactive substances above REPPIR threshold quantities are stored, even if these substances are stored for very short periods (as is often the case at airports), the place where they are stored is a premises to which REPPIR applies. There is no exemption for 'intermediate temporary storage', as in the Control of Major Accident Hazards

	Regulations 2015 (COMAH). 18 Vessels that are powered by nuclear reactors are to be treated as separate premises when at fixed point moorings such as buoys or alongside berths, unless they are moored at a nuclear licensed site or Ministry of Defence (MOD)-controlled premises in which case they are part of those premises. For emergency planning purposes at non-licensed commercial docks, it is the geographical identity of a particular vessel at a particular mooring or berth that is the key factor. For example, a vessel at a berth constitutes a premises. If that same vessel moves to a different geographical location, then this constitutes a different premises. The assessment for a particular vessel needs to underpin the off-site emergency plan for that vessel at a particular mooring or berth, and the off-site emergency plan needs to be in place before the vessel arrives at that mooring or berth. 19 Ships and aircraft loading and unloading radioactive substances would count as transport and be covered by MCA (Maritime and Coastguard Agency) and CAA (Civil Aviation Authority) legislation.
Regulation 2(1)	*"protective action" means an action or actions taken in order to prevent or reduce the exposure of emergency workers, members of the public, the environment or the contamination of property from ionising radiation in the event of a radiation emergency, and includes the provision of appropriate information to the public in accordance with regulations 21 and 22;*
Guidance 2(1)	20 This is action that is taken to prevent or reduce radiation exposure of workers, public, environment and contamination of property in the event of a radiation emergency. 21 Protective action includes: (a) Mitigatory action is immediate action taken by the operator or other party, in relation to a radiological hazard on site, to: (i) Reduce, and where possible prevent, the potential for conditions to develop that would result in exposure or a release of radioactive material requiring emergency response action on the site or off the site; (ii) Mitigate source conditions that may result in exposure or a release of radioactive material that require, or are likely to require, urgent or longer term protective actions on the site or off the site; and (iii) Prevent escalation of an emergency and to return the facility to a safe and stable state. (b) Urgent protective action is aimed at reducing exposure to people prior to and during the early phase of a radiation emergency. It includes sheltering-in-place; administration of stable iodine; evacuation; and restrictions on food and water supplies. Some of this action may be taken on a precautionary basis. In addition, other urgent protective action such as personal decontamination, medical intervention and reassurance monitoring may be required at an individual level and on a case-by-case basis, according to the prevailing circumstances. (c) Longer term protective action is aimed at reducing exposure to people during the intermediate and long term phase resulting from a radiation emergency (such as transition to an existing exposure situation). This action includes continuing restrictions on food and water supplies; temporary and permanent relocation; and recovery action. Recovery action provides protection from longer term exposures from contamination of the environment and food supplies. Some longer term protective action, such as follow-up health surveillance may be taken on a precautionary basis.

Regulation 2(1)	*"radiation emergency" means a non-routine situation or event arising from work with ionising radiation that necessitates prompt action to mitigate the serious consequences—* *(a) of a hazard resulting from that situation or event;* *(b) of a perceived risk arising from such a hazard; or* *(c) to any one or more of—* *(i) human life;* *(ii) health and safety;* *(iii) quality of life;* *(iv) property;* *(v) the environment;*
Guidance 2(1)	22 The term radiation emergency is central to the interpretation of the main requirements of REPPIR as it encompasses all events which could potentially lead to an emergency for which the response necessitates the level of planning that REPPIR commands. 23 A non-routine situation or event could be as a consequence of a deviation in normal activity of persons, equipment, systems or facilities, or due to an external factor. Examples of initiating events are plant and equipment failures, breakdown of administrative arrangements, human error, extreme weather or seismic activity. 24 For the purposes of REPPIR, all events that may result in an annual effective radiation dose of 1mSv or more to one or more person(s) off-site over a period of one year following the event are considered to be a radiation emergency (in addition to perceived risks). **Serious Consequences** 25 The definition of a radiation emergency covers serious consequences that might arise from releases of radiation including consequences to human life, health and safety, quality of life, property and the environment. There are no serious radiological consequences at the REPPIR threshold of an annual effective radiation dose of 1mSv over a period of one year following the radiation emergency and therefore this dose is bounding. The impact table (Appendix 2, Figure 3) provides descriptions of the impact at different dose levels against all the factors identified in the definition of a radiation emergency. 26 In the impact table (Appendix 2, Figure 3), the rows denote impact and the columns denote descriptors. Impacts are categorised as being either limited, minor, moderate, significant or catastrophic. Descriptors are the factors which would be impacted by a radiation emergency as defined and include human life, health and safety, quality of life, property and the environment. The impact table provides qualitative descriptions of what the impact would be in the context of each of these factors. For example, a catastrophic impact on property is described as the asset value being completely lost. Dose exposure ranges are identified which relate to each of the impact levels identified. 27 By using this radiation dose threshold based on radiological consequences, other types of serious consequences (eg. to human life, health and safety, quality of life, property and the environment) do not require further explicit assessment. Since assessment using this low exposure threshold will ensure that all events with serious consequences will be identified for the purpose of the hazard evaluation, events below this threshold will not be a radiation emergency. Further assessment of the additional factors identified in the definition is not necessary as any situation that would require prompt action from considerations of human life, health and safety, quality of life, property, and the environment is bound by the radiological consequences. 28 REPPIR requires a more detailed level of hazard evaluation (or risk assessment) and

	planning for non-routine events than the 2017 Regulations and other health and safety regulations. This is because of the potentially serious consequences of certain events occurring whilst working with large amounts of radioactive material (i.e. quantities or masses of radionuclides greater than those in Schedule 1 or Schedule 2). Therefore a radiation emergency, as defined in REPPIR, encompasses only those events that give rise to serious consequences. For the purposes of REPPIR, the effects of ionising radiation must have a bearing on the overall consequences. **Prompt Mitigatory Action** 29 Any initiating event that leads to a radiation emergency will require prompt action to be taken to mitigate the consequences. The need for prompt mitigatory action is key to the definition and therefore consideration is only necessary of those events that require specific steps to be taken as soon as is reasonably practicable and that have the purpose of mitigating the serious consequences. For example, prompt action would usually need to be taken to mitigate hazards such as fires, explosions, radiation releases or irradiation events, which could all potentially have serious consequences. **Perceived Risk** 30 Prompt mitigatory action could also be required to respond to a perceived risk arising from a hazard on any premises. An example of a perceived risk could emanate from an explosion heard by persons off-site at a distance from a site but where there is no release or exposure to radiation. In this case, the operator should determine whether the situation constituted a radiation emergency based on expert knowledge of the plant, prior hazard evaluation and the evolving situation and to determine if and what urgent protective action is to be taken. The operator should also consider the likelihood of any serious consequences from the perceived risk, i.e. could persons off-site take action that could cause detrimental harm to themselves or others? Any action taken by persons off-site may be due to a lack of knowledge of the risk. For example, the population living in the environs of a nuclear site could be alarmed due to their knowledge of the site and make an incorrect assumption that there has been a release of radiation. Social media has the potential to promulgate concern in a very short period which could result in self-evacuation causing disruption, panic and harm to people. Meanwhile the operator may consider that there would be no serious consequences directly from the event on the site, however prompt action may be required to communicate the risk from the explosion to the local population, to provide reassurance and to make clear what action the population should or should not take. 31 Conversely, assumptions made by the local population on hearing an explosion from a hospital with a nuclear medicine facility will likely not cause concern of a release of radiation. In this and similar cases, the perceived risk need not be considered, although some communication with the public might be necessary. 32 For defence nuclear sites and operational berths, public perception could vary. Defence nuclear sites will have similar public perception of the hazard and consequence to civil nuclear sites, whereas for those operational berths where nuclear submarines visits are infrequent, public perception of the hazard and consequence may be lower. **Action to mitigate the serious consequences to the environment** 33 Prompt actions with regard to the environment, such as preventing or minimising contamination or movement of land, water, air, plants and animals, are those relating to long-term human health protection.
Regulation 2(1)	*"radiation protection adviser" means radiation protection adviser within the meaning of the 2017 Regulations and who is recognised as such for the purpose of regulation 14 of*

	those Regulations; *"radioactive substance" means any substance which contains one or more radionuclides whose activity cannot be disregarded for the purposes of radiation protection;* *"reference level" is to be interpreted in accordance with regulation 20;* *"regulator" means—* *(a) the Health and Safety Executive; or* *(b) the Office for Nuclear Regulation in the event the premises is—* *(i) a licensed site;* *(ii) an authorised defence site);* *(iii) a nuclear new build site; or* *(iv) nuclear warship site;* *(c) but in the event that an agreement has been reached between the Health and Safety Executive and the Office for Nuclear Regulation to transfer responsibility in respect of specific premises, the person to whom that responsibility was transferred;* *"sealed source" means a source containing any radioactive substance whose structure is such as to prevent dispersion of radioactive substances into the environment;*
Guidance 2(1)	34 Sealed source is relevant to the definition of non-dispersible source (see paragraphs 7-9 on the definition of 'non-dispersible source'.)
Regulation 2(1)	*"work with ionising radiation" means work involving the production, processing, handling, use, holding, storage 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.*
Regulation 2(2)	*2. 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 or business or other undertaking carried on by that person, in control of the operation of premises, and* *(b) in relation to a licensed site, a person to whom a nuclear site licence has been granted,* *and any duty imposed by these Regulations on the operator extends only in relation to those premises.*
Guidance 2(2)	35 The operator is the person or organisation in control of the premises. At ports and airports, the premises usually include the storage site and sometimes also include the quayside or tarmac onto which the radioactive substances are unloaded and any intervening areas (see paragraphs 10-19 on the definition of 'premises' - ports and airports - in regulation 2(1)). At ports, the person in control of these premises is usually either the berth operator or the harbour authority, but in this document they will be referred to as the berth operator. At airports, this person is usually known as the transit shed operator and will be referred to as such. 36 Where duties under these Regulations are imposed on an operator for the first time, that operator is referred to as a 'new operator' in this ACOP and guidance.

Regulation 2(3)	*(3) In these Regulations—* *(a) any reference to an effective dose means the sum of the effective dose to the whole body from external ionising radiation and the committed effective dose from internal ionising radiation; and* *(b) any reference to equivalent dose to a human tissue or organ includes the committed equivalent dose to that tissue or organ from internal ionising radiation.*
Guidance 2(3)	37 These Regulations deal with acute doses to emergency workers and doses accrued during one year immediately following the start of a radiation emergency for other persons. The dose comprises the sum of direct external radiation and internal radiation (eg from inhaling airborne radioactive substances or ingesting contaminated food and drink).
Regulation 2(4-5)	*(4) In these Regulations, unless the context otherwise requires, any reference to—* *(a) an employer includes a reference to a self-employed person and any duty imposed by these Regulations on an employer in respect of its employee extends to a self-employed person in respect of that self-employed person,* *(b) exposure to ionising radiation is a reference to exposure to ionising radiation arising from work with ionising radiation.* *(5) In these Regulations, references to "local authority", unless the context otherwise requires, are to the local authority in which the premises are situated, and references to "lead local authority", where more than one local authority is involved, are to that local authority.*

Regulation 3 Application

Guidance 3	38 REPPIR applies to premises where work involves quantities of radionuclides that exceed those in Schedule 1, or exceed the masses of fissile material in Schedule 2 unless the operator can demonstrate that the quantity present would not allow an annual effective dose greater than 1mSv to a member of the public following a radiation emergency. REPPIR does not apply to the transportation of radioactive materials where the similar requirements for emergency planning are contained in CDG. 39 In broad terms, an annual effective dose in excess of 1 mSv to a member of the public cannot occur where the work on a premises involves quantities of a single radionuclide that are, in total, less than or equal to the relevant value in Schedule 1. However, where work on the premises involves more than one radionuclide, each with a total quantity less than the corresponding values in Schedule 1, an annual effective dose in excess of 1 mSv to a member of the public cannot occur only where the quantity ratio of these radionuclides, calculated in accordance with Schedule 2, is less than one. Only in situations where the quantities of a radionuclide or ratio of multiple radionuclides exceed these values may there be the potential for greater doses to occur. 40 The radionuclides and quantities in Schedule 1 have been derived by Public Health England (PHE) modelling the consequences of a worst-case release (100% release of the radioactive material present) and a conservative 12 month occupancy accident scenario involving the release of radioactive substances from a premises (see PHE report *XXXXX*).[XX] 41 For some operators, for example nuclear sites, including those undergoing decommissioning, their work with ionising radiation will rarely be below the activity

	quantities for the radionuclides listed in Schedule 1. 42 The masses of fissile material in Schedule 2 are derived from their potential to produce a criticality accident. 43 Some radioactive materials in quantities greater than Schedule 1 are exempt under regulation 3(5). Such exemption is on the basis that, by the nature of their containment or low specific activity concentration, they comply with the principle that, in broad terms, an annual effective dose to a member of the public in excess of 1 mSv cannot occur.
Regulation 3(1-4)	*(1) Subject to paragraphs (2) and (5) and with the exception of regulation 22, these Regulations apply to any work with ionising radiation which involves having on any premises , or providing for there to be on any premises, a radioactive substance containing more than the quantity specified in relation to that radionuclide in Schedule 1 or, in the case of fissile material, more than the mass of that material specified in Schedule 2.* *(2) These Regulations do not apply to work falling within paragraph (1) where the operator can demonstrate that the quantity present on the premises would not allow, in a radiation emergency situation, an annual effective dose to persons off-site of greater than 1 mSv.* *(3) Where a radionuclide is not specified in Schedule 1—* *(a) an operator must carry out an assessment to determine whether the quantity present on the premises allows an annual effective dose greater than that specified in paragraph (2); and* *(b) if that assessment demonstrates that an annual effective dose greater* *(b) than that specified in paragraph (2) is allowable, then these Regulations apply.* *(4) For the purposes of paragraph (1), a quantity specified in Schedule 1 is to 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 1 of Schedule 1; or* *(b) where more than one radionuclide is involved, the quantity ratio calculated in accordance with Part 2 of Schedule 1 exceeds one.*
Guidance 3(1-4)	**Application to premises** 44 REPPIR apply to work with ionising radiation where the quantity of any radionuclide on the premises exceeds a specified quantity in becquerels in Part I of Schedule 1. Where there is more than one radionuclide on the premises, REPPIR apply to those premises if the quantity ratio, calculated in accordance with the equation in Part 2 of Schedule 1, is greater than one. The quantities are those present on the premises, including any planned increases in quantities in the facilities provided. These quantities may be different from those authorised under The Environmental Permitting (England and Wales) (Amendment) Regulations 2018[1] and The Environmental Authorisations (Scotland) Regulations 2018 (EASR)[2]. 45 REPPIR also apply to premises where the mass of any fissile material on the premises exceeds a specified quantity in grams in Schedule 2. This application relates to the potential criticality of the fissile material. 46 In the case of radionuclides not specified in Schedule 1, the operator must carry out an assessment to determine whether the quantity present on the premises could result in an annual effective dose to a member of the public greater than 1 mSv. This assessment should follow the methodology used and published[#x] by PHE to calculate the values listed in Schedule 1. 47 In relation to premises, all the radioactive substances in all the installations (except

the sources and radioactive substances exempted by regulation 3(5)) must be considered when calculating the quantity ratio across the whole premises. If the quantity ratio exceeds one, then REPPIR apply. If the quantity ratio is less than or equal to one, then REPPIR does not apply. The sources and radioactive substances exempted by regulation 3(5) can be excluded from the calculation since it is not credible that these would significantly contribute to an annual effective dose to members of the public.

48 Although there may be greater activity or mass of radioactive materials on a premises than in Schedule 1 or 2 respectively, where the operator can demonstrate that the radiological consequences from an event on site will result in an effective dose over one year of less than 1 mSv then these Regulations do not apply. The guidance under regulations 4, 5, and 7 will assist the operator in making the case for demonstrating compliance with regulation 3(2) and records of this should be maintained in accordance with regulation 23.

49 If premises change ownership the new operator would have to consider the application of regulation 3 to their work activity.

Application to transport

50 REPPIR does not specifically apply to the transport of radioactive materials. (For road, rail and inland waterway, the CDG apply. For air, the International Air Transport Association (IATA) International Dangerous Goods Regulations apply. For sea, the International Maritime Dangerous Goods (IMDG) Code applies). However:

(a) movement of radioactive materials through public places by other means, such as pipelines are included in REPPIR.
(b) the requirement to provide information to the public in the event of an emergency in regulation 22applies to any emergency which does or could have the same impact as a radiation emergency, however that emergency may arise, and therefore includes transport emergencies.

51 A public place includes public rights of way and other premises or places to which at the time in question the public have or are permitted to have access, whether on payment or otherwise. To decide whether a place is a public place, the test is whether the place in question is one where members of the public might be found and over which they might be expected to be passing or using for the purposes of access. Where use of the place is tolerated by the proprietor, that place is a public place. For hospitals, ports and airports, there may be areas within its boundary which are public places and those which are not.

52 Berth and transit shed operators at ports and airports, where radioactive materials may or may not be unloaded, are considered operators under REPPIR if they handle or store non-exempt quantities of radionuclides or masses of fissile material greater than those indicated in Schedules 1 or 2, even on a temporary basis.

Application to uranium

53 Uranium commonly occurs as either natural, enriched, or depleted uranium. These terms refer to the proportion of the isotopes ^{238}U, ^{235}U, and ^{234}U in the material. Natural uranium, that is uranium as it is extracted from its ore, consists mostly of the ^{238}U isotope, with the ^{235}U and ^{234}U isotopes respectively comprising approximately 0.72% and 0.006% of natural uranium by mass. Enriched uranium is prepared for its fissile properties and, as a result, is enriched to various degrees in the isotopes ^{235}U and ^{234}U. The process of uranium enrichment progressively removes the isotope ^{238}U from the others, so that a by-product of the process is uranium depleted in ^{235}U (and ^{234}U); this is known as depleted uranium and consists almost entirely of ^{238}U. The percentage of ^{235}U in depleted uranium is approximately 0.25-0.30%, with ^{234}U being present only as a trace (about 0.002%).

54 Application of REPPIR to enriched uranium will be determined by its mass, as set out in Schedule 2.

	55 For natural and depleted uranium, the quantity that determines the application of REPPIR should be taken from Schedule 1. For natural occurring uranium on a premises, the quantity specified in Schedule 1 for ^{235}U and ^{234}U is 3 GBq. Based on a specific activity of 25.4 Bq mg^{-1}, this corresponds to a mass of approximately 120 kg. For depleted uranium on a premises, the quantity specified in Schedule 1 is 4 GBq. Based on a specific activity of 14.88 Bq mg^{-1}, this corresponds to a mass of approximately 270 kg. As newly separated (ie extracted from its ore) uranium 'ages', the activity concentration of its radioactive progeny increases and so these have to be taken into account when deciding upon the application of REPPIR (using the quantity ratio - see Part 2 of Schedule 1). However, most progeny take many years to achieve significant activities and so in many circumstances are disregarded for the purpose of REPPIR application decision-making. 56 In the case of uranium ore, all progeny will be in activity equilibrium (so-called secular equilibrium) with the uranium 'parent' and will have to be taken into account when deciding upon the application of REPPIR.
Regulation 3(5)	*(5) These Regulations do not apply in respect of—* *(a) any non-dispersible source;* *(b) any radioactive substance which has an activity concentration of not more than 100Bqg^{-1};* *(c) any radioactive substance conforming to the specifications for special form radioactive material set out in sub-section 2.7.2.3.3. of the UN Model Recommendations on the Transport of Dangerous Goods: Model Regulations ("UN Model Regulations")* ([11]), *as revised or reissued from time to time* *(d) any radioactive substance which is in a package which complies with the requirements for a Type B(U) package, a Type B(M) package or a Type C package as set out in subsections 6.4.8, 6.4.9 or 6.4.10 of the UN Model Regulations respectively.*
Guidance 3(5)	57 REPPIR does not apply to the particular radioactive sources and substances (a-c) since it is highly unlikely that a radiation emergency could occur involving such sources and substances. Operators need not take account of these when calculating the quantity ratio to establish whether REPPIR apply to their premises. Assessments to identify hazards and evaluate risks from such sources will instead be undertaken under the 2017 Regulations and the Management of Health and Safety at Work Regulations (MHSWR). 58 Even though REPPIR does not apply to these sources and substances there are still requirements to prevent radiation accidents (as defined in the 2017 Regulations), limit consequences of radiation accidents, draw up contingency plans, and rehearse contingency plans at suitable intervals under the 2017 Regulations. **Sealed sources manufactured to Special Form** 59 Special form radioactive material, as defined in the ADR2019 (ADR is a European Agreement Concerning the International Carriage of Dangerous Goods by Road) and invoked by CDG, is exempt under regulation 3(5)(c) due to the certified robustness of their encapsulation that prevents dispersion under internationally defined test conditions. Where special form certification is no longer valid due to the certification period having expired, then these sources should be considered as 'sealed sources' below and assessed as non-dispersible sources. Where special form certification has been withdrawn by the

([11]) The Model Recommendations can be found at https://www.unece.org/trans/danger/publi/unrec/rev19/19files_e.html or can be inspected at the offices of the Department of Business, Energy and Industrial Strategy at 1 Victoria Street, London, SW1H 0ET.

relevant competent authority then the reasons for withdrawal are relevant to whether the source may still be considered as a sealed source for the purposes of non-dispersibility assessment described below. Sources that cannot or can no longer be shown to be special form radioactive material and do not meet the requirements for non-dispersibility, cannot claim exemption from REPPIR.

Non-dispersible sources

60 Non-dispersible sources (see definition of 'non-dispersible source' in regulation 2(1)), as demonstrated by the operator, are exempt under regulation 3(5)(a) due to the robustness of their design that prevents dispersion under internationally defined test conditions (sealed sources) or conditions assessed by the operator (sources not considered as sealed).

61 Operators who consider that a radioactive substance that they are using is non-dispersible should complete an assessment under MHSWR to confirm that this is the case.

Making a case to demonstrate that a source is non-dispersible under Regulation 3(5)(a).

Sealed sources manufactured to International Organisation for Standardisation (ISO) 2919 standards

62 A sealed source whose fabrication is compliant with the current ISO2919 standard for the manufacture of sealed sources [which contains sealed source performance tests for the protection against the release of radioactive material] may be considered to be non-dispersible with respect to these Regulations under the following conditions:

(a) Manufacture of the sealed source complies with the general requirements detailed in ISO2919;

(b) The source fabrication meets the classification and performance requirements in ISO2919 that are appropriate to demonstrate non-dispersibility of the radioactive materials contained for category of usage of that source.

(c) Where one is specified by the manufacturer, it is within its recommended working life*, or where it is beyond its recommended working life and the manufacturer is able to confirm that it is not aware of experience of encapsulation failing for that particular design of sealed source; and

(d) The source has undergone routine maintenance, inspection and testing, and the environmental conditions in which the source has been kept since manufacture have been maintained in accordance with the manufacturer's instructions.

* The recommended working life is the period of time within which the manufacturer expects the source to meet its stated performance requirements under design conditions of environment and usage. Recommended working life is often referred to by an equivalent term by different manufacturers but for the purposes of REPPIR, has the same meaning.

Other Non-Dispersible Sources

63 For sealed sources that are not special form radioactive material or sealed sources that do not meet the requirements of paragraph 62 referring to ISO standards above, the operator should make a case to show that in situations or events that challenge its integrity, that there will be no dispersion of radioactive substances.

	64 Similarly, for sources not considered as sealed sources (eg. un-encapsulated sources) that might nevertheless be considered to be non-dispersible, the operator should make a case to show that in situations or events that challenge its integrity, that there will be no dispersion of radioactive substances. **Making the Case for Non-Dispersibility** 65 To make the case for non-dispersibility, the operator should first decide which non-routine situations or events should be considered that might affect the integrity of the source or radioactive material. These events or situations can be grouped according to their impacts, for example, events/situations that involve fire, chemical or physical trauma or a combination of these. 66 Operators should firstly consider which of these impacts is possible on their premises; for example, if there are no circumstances by which a source or radioactive material might come into contact with a corrosive atmosphere or a corrosive substance, then these impacts need not be considered. Similarly, an operator should consider the feasible extent of potential impacts; for example the maximum likely temperature of a fire due to the materials held on the premises. 67 The operator should then carry out an assessment to determine dispersibility using the flow diagram in Appendix 1, Figure 1, taking into consideration those impacts. 68 Overall it should be the robustness and/or chemical inertness of the source or radioactive substances that forms the basis of the case rather than the exposure risk that results from a 'dispersive' event such as a fire, although this is a relevant factor. As a general rule, only solid, non-combustible radioactive substances or radioactive substances that are encapsulated in solid, non-combustible materials should normally be considered worth assessing for their non-dispersibility. 69 Specialist assistance should be sought to complete the assessment either from the source manufacturer or an appropriately qualified person in the case that the operator does not have sufficient expertise. 70 A record of the assessment should be retained for the period in which the operator has the non-dispersible source on their premises. Operators should review their assessment at least every three years. **Radioactive substances not more than 100 Bq g^{-1}** 71 REPPIR do not apply to any radioactive substance on a premises which has an activity concentration of less than 100 Bq g^{-1}. These radioactive substances are generally naturally occurring low specific activity materials such as zircon sands. **Radioactive substances in Type B(U), B(M) or C transport packages** 72 REPPIR do not apply to any radioactive substance on a premises which are contained in these types of transport packages. However, if the radioactive materials are removed from the package at any time, for example to be used, tested or inspected, then the dis-application no longer applies.

Regulation 4 Hazard evaluation

Guidance	73 Identifying hazards, evaluating risks, and preventing accidents from occurring

4	through appropriate control measures are fundamental to all health and safety legislation, and these requirements are included in REPPIR. Preventing radiation emergencies requires a comprehensive legal framework to manage the control of exposure to ionising radiation, through a range of engineering and administrative controls, and this is provided by the 2017 Regulations which also apply to all work activities covered by REPPIR. The main purpose of REPPIR, however, is that if these control measures fail and a radiation emergency occurs, then emergency arrangements are in place which will mitigate the consequences of the emergency. 74 Regulation 4 requires the operator to carry out an evaluation to identify the hazards and assess the risks from the work with ionising radiation that they propose to carry out which have the potential to cause a radiation emergency. Having identified these hazards and risks, the operator is then required to make arrangements to prevent any radiation emergency and to limit the consequences of any such emergency that occurs.
Regulation 4(1-2)	*(1) The operator of any premises to which these Regulations apply must make a written evaluation before any work with ionising radiation is carried out for the first time at those premises.* *(2) The evaluation required under paragraph (1) must be sufficient to identify all hazards arising from the work undertaken which have the potential to cause a radiation emergency.*
ACOP 4(1-2)	**75 The hazard evaluation should determine:** **(a) the potential consequences of each radiation emergency in terms of the maximum effective dose to persons off-site assuming no protective actions are implemented, and** **(b) the likelihood of the consequence occurring.** **76 Evaluating a low likelihood for a radiation emergency to occur should not be used as a reason for discounting the hazard from having the potential to cause a radiation emergency. Operators should consider the possibilities for radiation emergencies with extremely low likelihoods but potentially severe or very severe consequences.**
Guidance 4(1-2)	**Requirement for a written hazard evaluation** 77 Where Regulations 4(1) and 4(5) require that an operator undertakes a hazard evaluation before any work with ionising radiation is carried out for the first time or in relation to the continuation of any work with ionising radiation after the coming into force of these Regulations, it is referring to: (a) existing and new operators who plan to first start work with radioactive materials to which these Regulations apply; (b) operators who take on responsibility for existing premises to which these Regulations apply and therefore have such responsibility for the first time; (c) operators that wish to increase their inventories to amounts that will become above the thresholds in Schedules 1 or 2 (i.e. new premises in REPPIR) for the first time; and (d) operators that were undertaking work to which these Regulations apply prior to these Regulations coming into force, noting the transitional provision in regulation 28; **Identifying hazards with the potential to cause a radiation emergency** 78 Regulation 4(2) requires all operators to identify the hazards[4] that have the potential to cause a radiation emergency, including direct radiation and criticality accidents. This requirement covers events of very low probability that may not have been considered within the design of the installation up to and including unforeseen events. [#4 In Regulation 4(2), the term "hazard" is being used to refer to the non-routine situation or

initiating event that has the potential to cause a radiation emergency.]

79 The process for identifying potential radiation emergencies should be systematic, auditable and comprehensive, and should include:

(a) significant inventories of radioactive material and also any radioactive sources that have not been exempted on grounds of being non-dispersible sources under Regulation 3(5) that may be lost or damaged;
(b) planned operating modes and configurations, including shutdown states, decommissioning operations, and any other activities with the potential to cause a radiation emergency;
(c) chemical and other internal hazards, man-made and natural external hazards, internal faults from plant failures and human error, and faults resulting from interactions with other activities on the premises.

80 The evaluation should cover all potential radiation emergencies. These range from a non-routine situation or an event, including a perceived risk, but which may not result in any radioactive release, up to events associated with very large radioactive releases (see the guidance on the definition of 'radiation emergency' for regulation 2(1)). The evaluation should take account of both chronic and acute consequences following an accidental release of radioactive substances.

81 The evaluation should include possible plant and equipment failures, breakdown of administrative arrangements, and human error. The extent and detail of the evaluation should reflect the likelihood and severity of the potential radiation emergency, and the findings should be recorded. The evaluation should use appropriate techniques for hazard identification and risk assessment. For operators with complex premises or those which contain large radioactive inventories with the potential for serious consequences this may include the need for Failure Modes and Effects Analysis (FMEA), Hazard Operability Analysis (HAZOP), Hazard Assessment Methodology (HAZAM), fault tree and event tree analysis, Quantified Risk Assessment (QRA), and Probabilistic Safety Analysis (PSA). This is likely to be the case for operators of nuclear premises licenced under the Nuclear Installation s Act 1965 (NIA).

82 Consideration of the ways in which the installation or equipment could fail or be damaged should not be limited to activities resulting from the work itself (such as failures of equipment), but also to internal hazards that occur within the premises/installation/system (such as fire, explosions, pressure part failure, flooding, dropped loads) and external events that originate from outside the premises (such as earthquakes, severe weather and aircraft crashes). The operator's evaluation needs to identify those hazards that are relevant to their premises; for example, a tsunami would not need to be considered if the installation is located far inland.

83 Rigorous application of risk assessment frameworks required under HSWA, the 2017 Regulations, MHSWR, and NIA should ensure that the predicted risks from fault sequences leading to significant radiological consequences are very low. Nevertheless, it is important that operators consider possibilities such as the risk assessment may be incorrect or incomplete; the true severity of an external hazard may exceed that considered in the analysis; or a safety measure could be circumvented or fail in some unpredicted way. This is especially true for operators of premises with large radioactive inventories or complex installations where the radioactive inventory is not passively stored. The insights gained from such analysis are important for planning for the possibility of very severe radiation emergencies and are used to inform the response activities that would be needed were such an emergency to occur.

84 Fault states, scenarios and sequences beyond the design basis of the installation that have the potential to lead to a very severe radiation emergency should be analysed. The analysis should through a systematic approach, analyse beyond design basis states and scenarios arising from the circumstances listed in the previous paragraph. In line with the requirement to consider unforeseen events, states and scenarios should not be dismissed from the analysis on the basis of likelihood alone. The analysis should not be concerned

with what was the cause of the severe radiation emergency, but should instead adopt a "cause agnostic" approach that focuses on what are the consequences of such severe radiation emergencies and the implications for outline emergency planning purposes.

85 Undertaking such analysis is not proportionate for all types of facilities and premises, as not all of them present radioactive inventories of sufficient magnitude to warrant this. However, such analysis is beneficial for facilities presenting the highest hazards, such as operating reactors, spent fuel storage installations and installations storing significant quantities of nuclear matter.

86 For some operators, potentially including those that operate non-nuclear premises, it may not be necessary or proportionate to perform a full scope hazard evaluation providing the operator can demonstrate that the unmitigated radiological consequences from a bounding hazard analysis case are limited as discussed in the following sections.

Evaluating the likelihood of each radiation emergency

87 Evaluating the likelihood of potential radiation emergencies is important in relation to ensuring a proportionate overall approach to emergency planning. It provides valuable context in relation to operator's decisions on the extent and complexity of their evaluations (Regulation 4(2)), the reasonably practicable steps required to prevent and limit the consequences (Regulation 4(4)), is an essential input into the consequence assessment (Regulation 5(1)), and the consequence report (regulation 7(1)) and the contents of the operator's emergency plan (regulation 10). However, given the requirement within REPPIR to consider events of very low probability that may not have been considered within the design of the installation, up to and including unforeseen events, evaluating a low likelihood of a hazard occurring should not be used as a reason for discounting the hazard from having the potential to cause a radiation emergency.

88 For each initiating event, potential fault sequences representing how the accident progresses should be developed and their potential consequences analysed. Initiating events leading to fault sequences protected by the same safety systems and equipment, and resulting in similar consequences, should be grouped, and their associated sequence frequencies summed. These summed sequence frequencies for the consequence to occur are the ones to be input into the REPPIR risk framework presented in the ACOP (Appendix 2, Figure 2) for Regulation 5(1). The source term selected to represent the group of sequences should be the most limiting one in terms of the radiological dose. The timescales taken for a release to occur should also be the most limiting. It is important that the frequencies of similar sequences should be summed together and not subdivided as this could otherwise potentially evade the requirements for a detailed emergency planning zone identified in the risk framework presented in the ACOP (Appendix 2, Figure 2) for Regulation 5(1).

89 Best-estimate methods and data should be used as far as possible within the hazard evaluation for determining likelihood of the initiating events. Installation-specific reliability data should be used as far as possible for the calculation of the probabilities. However where installation-specific data is not available, use of generic reliability data may be acceptable provided its applicability is justified and the data sources selected are used in a consistent and systematic manner. Where neither installation-specific nor generic reliability data is available, use of expert judgement may be acceptable, provided that the basis for the judgement is justified and documented, and careful consideration given to the impact of these judgements on the results when input in to the risk framework presented in the ACOP (Appendix 2, Figure 2) for Regulation 5(1).

90 For some operators it may not be necessary to quantify the likelihood of a radiation emergency in terms of a numerical probability providing the operator can demonstrate that the unmitigated radiological consequences from a bounding hazard analysis case are limited as discussed in paragraphs xx-xx. Instead a qualitative approach may be adopted in which events are allocated to qualitative categories based on expert judgement. The basis for such judgements needs to be justified and documented and careful consideration

needs to be given to the impact of these judgements when input in to the risk framework presented in the ACOP (Appendix 2, Figure 2) for Regulation 5(1). For the purposes of REPPIR six suitable qualitative descriptors based upon the national risk framework that may be applied are: "very high", "high", "medium", "low", "very low" and "events not considered in the design". These are presented in the risk framework in Appendix 2, Figure 2 together with the equivalent quantitative descriptors from the national risk framework which considers the likelihood of the event occurring within the next five years.

Evaluating the consequences of each radiation emergency

91 The operator will need to identify, through this evaluation, what the consequences would be if an identified radiation emergency occurred. Transient analysis or other analyses should be carried out as appropriate to provide adequate understanding of the behaviour of the installation under fault conditions. In particular, the evaluation should determine the nature, form and quantity of radioactive material that would be released (the source term or terms[5]). These source terms should be retained as they directly feed the consequence assessment required by Regulation 5(1) and Schedule 3. [#5 See Schedule 3 for definition of a 'source term'.]

92 For fault sequences that lead to a release of radioactive material or to exposure to direct radiation, an initial radiological consequence analysis should be performed to determine the maximum effective dose to a person outside the premises. In the case of a radioactive release it should be assumed that the person is directly downwind of an airborne release at the distance of greatest dose or as a result of exposure to direct radiation at the location off-site which gives the greatest dose. No protective actions should be assumed. An instantaneous release should be assumed and the dose should be assessed for a period of up to at least a year to ensure a conservative assessment.

93 These radiological consequence assessments are used to directly feed into the risk framework presented in Appendix 2, Figure 2 of the ACOP for Regulation 5(1). This information may be taken directly from existing risk assessments for the 2017 Regulations or safety cases produced under NIA if they are suitable and sufficient and available for the purpose. These radiological consequence assessments should be input into the risk framework together with the associated likelihood for the radiation emergency. This will determine the representative range of radiation emergencies to be used, and the associated source terms to be input into the consequence assessment required under Regulation 5(1) and Schedule 3. This information will in turn be used to determine the recommended distances for detailed and outline planning where applicable.

94 The hazard evaluation should consider the potential for events that could affect several facilities and activities concurrently, as well as consideration of the interactions between the facilities and activities, such as through either a common cause or through a domino effect. Thus, depending on the nature of the premises in question, the evaluation may identify a number of different events ranging from individual failures on a single installation (leading to single source term) to the multiple failures resulting from, for example, seismic events which damage several facilities (leading to several different source terms).

95 The hazard evaluation should also identify non-radiation related hazards to people on-site and off-site that are associated with the installation or activity and that may impair the effectiveness of or change the protective action to be taken. This may include the potential for hazards associated with explosion, fire, chemical releases, severe weather, and persons self-evacuating.

96 For some operators it may be possible for the operator to consider the unmitigated radiological consequences from a single bounding hazard analysis case providing it can be demonstrated that the consequences are limited. Such an assessment should consider a bounding radiation emergency in which, for example, a fire hazard results in the release

	of the entire radiological inventory within the premises and demonstrate that the consequences lie in the lower region of the risk framework (Appendix 2, Figure 2) where only outline planning is required and for which contingency planning under the 2017 Regulations would be sufficient. **Radiation Emergencies due to a perceived risk arising from a hazard** 97 For radiation emergencies due to a perceived risk arising from a hazard, operators should consider what the perception of any identified non-routine situation or event would be, including but not limited to members of the public off-site. For example, a non-routine situation or event may appear abnormal to off-site observers. Although the evaluation may show that off-site consequences do not exceed an effective dose over the first year of 1 mSv (without urgent protective action being assumed), the indication of an abnormal condition may mean that some off-site protective action, such as informing local emergency services of the nature of the event may need to be taken to avoid, for example, action amongst the local population being taken as a result of the perceived risk. An example of this is a fire that does not affect significant quantities of radioactive material, but results in palls of smoke and the attendance of local emergency services. However, due to the off-site consequences not exceeding 1 mSv there is no need to consider such an event within the consequence assessment performed under Regulation 5(1). There is no need to do an explicit hazard evaluation for these events. Instead, it is important to recognise this potential and ensure that emergency plans lead decision makers to recognise the symptoms and communicate with stakeholders in a timely manner to prevent escalation of the perceived risk. **Radiation Emergencies resulting in serious consequences to human life, health and safety, quality of life, property and the environment** 98 In practice the radiological dose consequence assessments evaluated above can be used as a surrogate for determining whether a hazard can cause a radiation emergency resulting in serious consequences to human life, health and safety, quality of life, property and the environment based upon the risk framework descriptors (Appendix 2, Figure 2) and the impact table (Appendix 2, Figure 3) presented in the ACOP for Regulation 5(1). The impact shows that each of the serious consequences that define a radiation emergency are effectively bounded by the 1 mSv effective dose over a year ensuring that hazards that can lead to these serious consequences should be accounted for in the hazard evaluation performed under Regulation 4(2). **Recording the written evaluation** 99 The written evaluation is expected to be kept for the period of its applicability and at least for 3 years from the date on which it was made.
Regulation 4(3)	*(3) Where the evaluation required under paragraph (1) does not reveal any hazards having the potential to cause a radiation emergency, reasons for such a conclusion should be set out in that evaluation.*
ACOP 4(3)	**100 The justification for such a conclusion should be based upon the limited radiological consequences of any hazard being less than 1 mSv effective dose over the period of a year and not upon arguments associated with the low likelihood of the event.**
Guidance 4(3)	101 The evaluation performed under Regulation 4(2) will show whether a hazard has the potential to cause a radiation emergency. For most large nuclear operations, this is likely to be the case. However, for static, non-nuclear operations, it may well be that a radiation emergency is not possible.

	102 When considering whether a radiation emergency is possible, any urgent protective action (such as the administration of 'stable iodine' tablets) should be disregarded, although longer term recovery action may be taken into account. 103 The value of the quantity of any radioactive substance in Schedule 1 is that which, if it were released in a radiation emergency on premises with no protective action implemented, could result in members of the public receiving effective doses of ionising radiation of, or in excess of, 1 mSv during the first year after the event. However, the operator's assessment may be able to justify adjusting some of the parameters assumed by PHE analysis underpinning the development of Schedule 1 with site specific information and conclude that the doses will not be in excess of 1 mSv. For example, off-site doses would depend on how much of the radioactive substance could be released at one time and it may be that fractions of the total quantity of radioactivity are kept at discrete locations around the premises (each fraction containing less than the quantity of radioactive substance in Schedule 1), and would not be released together. 104 The physical form of the radioactive substance is another key factor in whether a radiation accident is likely to lead to a radiation emergency. If the radioactive substance is a gas, then all of the material is likely to be released following an accident. If the radioactive substance is a liquid or dispersible solid, then only part of the material might be released during an accident. If the radioactive substance is a non-dispersible solid, then only a small part of the total quantity is likely to be released during an accident, even if that accident is a fire. If the quantity of radioactive substance likely to be released is greater than that in Schedule 1, the incident would fulfil the criteria for a potential radiation emergency. The types of questions that need to be answered are essentially the same as those that arise when a radioactive substance is being assessed for non-dispersibility - Appendix 1 is therefore relevant. 105 Once the decision has been made as to the likely fraction of activity that would be released, the dose consequences for members of the public in the year following an atmospheric release, such as may arise as a result of a fire, can be estimated from the values tabulated in Schedules 1. These values reflect conservative release and occupancy scenarios (Schedule 1).
Regulation 4(4)	*(4) Where the evaluation required under paragraph (1) does reveal the potential for a radiation emergency to occur, the operator must take all reasonably practicable steps to—* *(a) prevent the occurrence of a radiation emergency; and* *(b) limit the consequences of any such emergency which does occur.*
Guidance 4(4)	**Preventing radiation emergencies and limiting their consequences** 106 Where the evaluation identifies a hazard which may cause a radiation emergency, this regulation requires the operator to take all reasonably practical measures to prevent the hazard manifesting itself in the first place by, for example, limiting or eliminating holdings of radioactive materials. Where these measures cannot completely rule out the possibility of a radiation emergency occurring, then all reasonably practicable measures should be taken to reduce its consequences. 107 Steps to prevent radiation emergencies and limit their consequences are likely to comprise of a combination of measures relating to the physical design and control of the plant and equipment, processes and operating limitations, availability of back-up equipment and supplies to be used when an emergency occurs, and management structures and systems. 108 Measures to minimise the possibility of plant and equipment failures may include incorporating plant and equipment with high technical specifications, reliability

	requirements, and, where appropriate, seismic qualification. Measures to limit the consequences of any failures may include defence in depth incorporating redundancy and diversity where appropriate, physical layout of the installation and locations of occupied areas, additional shielding, installation of emergency detection mechanisms, and provision of extra containment. These are introduced most cost effectively at the design stage. 109 The success of administrative arrangements for prevention and mitigation can be maximised by considering the needs of employees and by providing adequate documented procedures, maintenance and testing regimes, monitoring systems, training, staffing arrangements and supervision for both routine operations and during a radiation emergency. Some operators will also need to consider specific arrangements to recognise and manage events that may be considered as extremely unlikely but have significant consequences. 110 The extent of the measures taken to reduce and mitigate the risks will reflect the likelihood and severity of the potential radiation emergency. 111 The operator may need to seek appropriate advice on topics such as engineering, fault analysis, radiological consequence assessment, radiological protection, and human factors when making arrangements to prevent potential radiation emergencies and to limit the consequences which may occur. 112 Operators need to clearly demonstrate what measures have been taken. Some operators will have extant requirements to do this, for example in the safety cases required of nuclear operators by the site licence conditions under the NIA.
Regulation 4(5-6)	*(5) The evaluation required by paragraph (1) also applies to the continuation of any work with ionising radiation carried out by an operator after the coming into force of these Regulations.* *(6) The requirements of this regulation are without prejudice to the requirements of regulation 3 (risk assessment) of the Management of Health and Safety at Work Regulations 1999* ([12]) *and to regulation 8 of the 2017 Regulations.*
Guidance 4(6)	113 The 2017 Regulations regulation 8(1-4) requires all relevant employers to undertake a thorough risk assessment of all hazards with the potential to cause a radiation accident, identify the risks, and take all reasonably practicable steps to prevent such accidents and limit their consequences. Some of the requirements of REPPIR are already addressed by these existing risk assessments prepared under the 2017 Regulations. Likewise, for a nuclear operator, some of the requirements of these Regulations are already covered by existing nuclear site licence conditions under NIA. These include requirements relating to hazard identification and risk evaluation covered by safety cases. The operator's NIA safety cases will therefore be a significant source of information for the purposes of these Regulations. In such circumstances, requirements met under the 2017 Regulations or NIA should satisfy equivalent requirements under REPPIR and it will not be necessary to duplicate information. Instead the relevant documents may be cross referenced within the evaluation report.
Regulation 4(7)	*(7) The operator must provide the regulator with details of the evaluation made under paragraph (1) within 28 days of the date on which it is made.*
ACOP 4(7)	**114 The written evaluation report required under Regulation 4(1) should include a description of (with supporting references to the details, as appropriate) of the following particulars:**

([12]) S.I. 1999/3242. Regulation 3 was amended by S.I. 2005/1541, S.S.I. 2006/457, S.I. 2015/21 and S.I. 2015/1637.

	(a) the name and address of the operator; **(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;** **(c) the date 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.** **(e) a description and details of any radioactive substance on the premises which is likely to exceed any quantity or mass specified in Schedule 1 or Schedule 2;** **(f) a plan of the premises in question and a map of the environs;** **(g) 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 1 or Schedule 2, and the nature of the containment for the radioactive substance;** **(h) a description of the hazards identified;** **(i) the potential for the hazard and its associated consequences to occur;** **(j) the associated source terms;** **(k) the off-site radiological doses;** **(l) those factors which could precipitate a significant release of any radioactive substance and the protective action to be taken to prevent such a release;** **(m) those factors which could precipitate a smaller but continuing release of any radioactive substance and the protective action to be taken to mitigate such releases;** **(n) 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 protective action to be taken to prevent any such incident;** **(o) information concerning the management systems and staffing arrangements by which the radioactive substance is controlled and by which the procedures are controlled.** **115 Sufficient records should be kept of the results of the evaluation, including in cases where it is concluded there is no potential for a radiation emergency, to allow for external verification.**
Guidance 4(7)	116 All operators must send a report of their hazard evaluation to the relevant regulator (see regulation 2) within 28 days of completing the evaluation. 117 The assessment report should contain the details required from (a) to (k) as described. The reports submitted should contain sufficient information and cross references for the relevant regulator to be able to confirm the conclusions reached. The documentation should also have been subject to appropriate document control procedures before issue. As noted in the guidance for Regulation 4(5), where the requirements complied with under the 2017 Regulations or NIA satisfy equivalent requirements under REPPIR it will not be necessary to duplicate information. Instead the relevant documents may be cross referenced within the evaluation report.

Regulation 5 Consequence assessment

Guidance 5	118 Regulation 5 requires that a full range of hazards identified as having the potential to cause a radiation emergency under Regulation 4 are assessed in a standardised way.

	The REPPIR risk framework presented in Appendix 2, Figure 2 is to be used to select a representative range of radiation emergencies, together with their associated source terms, which are then to be used to perform consequence assessments in accordance with Schedule 3. 119 The results of these consequence assessments are to be used to determine the recommended minimum area for the detailed emergency planning zone, the requirements for urgent protective action, and where applicable the recommended minimum area for the outline planning zone. Relevant results from this would then be captured in a consequence report under Regulation 7.
Regulation 5(1-2)	*(1) Where the evaluation undertaken under regulation 4 reveals the potential for a radiation emergency to occur, the operator must make an assessment, in accordance with Schedule 3, to consider and evaluate a full range of possible consequences of the identified radiation emergencies, both on the premises and outside the premises, including the geographical extent of those consequences and any variable factors which have the potential to affect the severity of those consequences.* *(2) The assessment required by this regulation must be completed within two months after the day on which the hazard evaluation required by regulation 4 is completed.*
ACOP 5(1-2)	**120 The operator should adopt the following process for the consequences assessment:** **a) use the outputs of the hazard evaluation to assess a full range of potential radiation emergencies identified against the REPPIR risk framework presented in Appendix 2, Figure 2;** **b) determine a representative range of source terms;** **c) undertake the consequence assessment for these source terms in accordance with Schedule 3; and** **d) perform a sensitivity study where the predicted likelihood of a radiation emergency lies in the outline planning region of the REPPIR risk framework but close to the boundary of the detailed planning region. The sensitivity study should assess what the implications are of increasing the likelihood by one order of magnitude to determine whether a small change in the likelihood assumption leads to a disproportionate increase in radiological consequence due to a severe radiation emergency moving from the outline planning region into the detail planning region.** **121 The representative range of source terms should:** **a) include a number of the most bounding cases within the detailed emergency planning zone and the outline planning zone of the REPPIR risk framework (Appendix 2, Figure 2); and** **b) sufficient number of source terms to enable the operator to demonstrate in a transparent way how it has determined the recommended minimum planning areas for detailed and outline planning and the recommended distances for sheltering, evacuation and the administration of stable iodine tablets.**
Guidance 5(1-2)	**Selecting a representative range of radiation emergencies** 122 Following evaluation of hazards performed under regulation 4(2), the operator should have identified a full range of radiation emergencies possible at the premises together with the likelihood for each radiation emergency to occur and its associated consequence in terms of a source term and an effective dose (the latter taken from either an the 2017 Regulations risk assessment or a safety case produced in response to NIA). The next step of the assessment process is for the operator to assess these potential

radiation emergencies using the REPPIR risk framework presented in Appendix 2, Figure 2.

123 The REPPIR risk framework is a risk matrix based upon the national risk register of civil emergencies with axes for impact and likelihood for a radiation emergency. It provides a graded approach for sentencing radiation emergencies gradually transitioning from requiring regulatory action to prohibit or curtail an activity as well as detailed and outline emergency planning through to requiring detailed and outline emergency planning, then only requiring outline emergency planning; and finally not requiring any emergency planning.

124 The impact axis of the REPPIR risk framework corresponds to the national risk framework and has five qualitative descriptors that are:

- limited,
- minor,
- moderate,
- significant, and
- catastrophic.

125 These qualitative descriptors correspond to effective dose for the most exposed person outside the premises. These are

- 1 mSv and below,
- 1 mSv to 10 mSv,
- 10 mSv to 100 mSv,
- 100 mSv to 1000 mSv, and
- 1000 mSv and above.

126 As noted earlier the likelihood axis has six qualitative descriptors that are:

- very high,
- high,
- medium,
- low,
- very low, and
- low probability events not considered in the design.

127 These correspond to the equivalent quantitative descriptors which are taken directly from the national risk framework which consider the likelihood of the event occurring within the next five years. These are:

- 1 in 2 or higher,
- 1 in 20 to 1 in 2,
- 1 in 200 to 1 in 20,
- 1 in 2000 to 1 in 200,
- 1 in 20,000 to 1 in 2,000, and
- less than 1 in 20,000.

128 The final descriptor covers events potentially not considered within the design and extends out to cover unforeseen events.

129 The value of 1 in 20,000 in a five year period represents the lowest likelihood considered in the national risk framework and so it is taken to be appropriate to use this as the lowest likelihood for which detailed emergency planning should be required and the point at which outline emergency planning (or even no emergency planning in the case of low consequence events) is sufficient. However, it is recognised that there are always uncertainties associated with the estimation of such low likelihood events. For this reason, the operator needs to perform a sensitivity study to see what the implications would be if the predicted likelihood of a radiation emergency that lies in the outline planning region is increased by one order of magnitude to see if this moves it into the detailed planning region and so as to demonstrate there is no disproportionate increase in the consequences.

130 The operator should assess a full range of potential radiation emergencies identified

against the REPPIR risk framework presented in Appendix 2, Figure 2 to select a representative range of radiation emergencies. A number of the most bounding cases should be selected for the consequence assessment in accordance with the requirements of Schedule 3.

131 The exact number of source terms required to provide a representative range of radiation emergencies will vary and depends upon the nature and complexity of the premises and the range of hazards that are possible, and so cannot be prescribed. However, the number of source terms required should be based upon the overall objective of providing the local authority with sufficient information to develop its off-site plan. For example, where the premises includes a range of facilities with differing radiological inventories such as major spent fuel storage and reprocessing installations, at least one bounding source term should be provided for each major installation for input into the REPPIR risk framework.

132 For an operating gas-cooled reactor it may be sufficient to provide source terms for just the reactor and the fuel handling route (including the spent fuel storage installation). However, the range of source terms may need to consider a range of reactor faults such as depressurisation faults and faults that lead to the lifting and reseating of a safety relief valve and/or the consequential depressurisation of the reactor such as boiler tube failure faults, reactivity faults, gag faults, and dropped fuel faults. In contrast a single source term may be appropriate for non-nuclear operators.

133 In the case of an operating light-water reactor, faults associated with containment by-pass or loss of coolant accidents with leakage from containment may need to be considered. It is recognised that modern light-water reactors are designed with the intention of eliminating radioactive releases within the design basis. Nevertheless, given the large hazard potential associated with operating power reactors there is the expectation that a minimum area for detailed emergency planning will be nominated by the operator consistent with international standards and guidance produced by the IAEA. [Ref IAEA General Safety Requirement GSR part 7, IAEA Specific Safety Requirement SSR-2/1 and IAEA Safety Guide GS-G-2.1].

134 The key criteria in determining the number of source terms required is that it should be sufficient to enable the operator to demonstrate in a transparent way how it has determined the recommended minimum planning areas for detailed and outline planning and the recommended distances for sheltering, evacuation and the administration of stable iodine tablets. It is also important that when determining the list of source terms, the operator also identifies the timescales associated with the release of each source term as this will also inform the requirements of the local authority off-site emergency plan.

Performing the consequence assessment

135 Having obtained a range of representative source terms using the REPPIR risk framework the operators should assess these source terms in a standardised way. It should be noted that both radiation emergencies that lead to exposure to direct radiation and radiation emergencies that lead to the release of radioactive material should be assessed. However, in the case of radiation emergencies that cause a release of radioactive material, the assumptions set out in Schedule 3 must be used in the radiological consequence assessment. The extent and detail of the consequence assessment should reflect the likelihood and severity of the potential consequences of the radiation emergency. The complexity of the assessment can be much simpler for low likelihood and/or low consequence events.

136 The requirements in Schedule 3 for the consequence assessment include consideration of the range of potential source terms and weather conditions, the different persons that may be exposed and the effective and equivalent doses they may receive, the pathways for exposure, and the distances within which urgent protective action may be warranted for the different source terms when assessed against the relevant ERL. ERLs are published by PHE. [Reference to be inserted XX.] Further guidance on the

assumptions to be used to meet the requirements of Schedule 3 including the means of determining the DEPZ are provided in the ACOP and guidance for Schedule 3.

137 The assessment of effective doses for persons on the premises under regulation 5(1), will be for relevant groups of employees on the premises that should include, as a minimum, the operator's and their contractors emergency workers, emergency workers attending from outside the premises such as emergency services with a defined role in the operator's emergency plan, and other employees.

138 The assessment of effective doses for persons outside the premises under regulation 5(1), will be for relevant groups of persons outside the premises that will include members of the public and emergency workers with a defined role in the off-site emergency plan.

139 Although the effective doses assessed in paragraphs 137 and 138 are not required to be contained in the consequence report made under regulation 7, this information is essential to emergency planning requirements under regulations 18 and 20 so should be shared, as appropriate, with relevant organisations under regulations13 and 15.

Consideration of uncertainties in the consequence assessment

140 Radiological analyses should include any direct radiation and any inhalation, absorption and ingestion of radioactive material and should also take account of the physical and chemical form of the radioactive material released.

141 Variable factors which have the potential to affect the severity of those consequences relate primarily to weather related conditions, for example, wind speed and direction, raining or dry. Unless specific factors apply, apart from the uncertainties in source terms, and weather variables, consideration of additional uncertainty in the dose assessment such as occupancy/ habits/ inhalation rates (representative averages for the UK are sufficient), dose per unit intake, are unwarranted for emergency planning purposes.

Recording the consequence assessment

142 Operators need to demonstrate, when requested, that the consequences of the full range of radiation emergencies have been assessed and understood, and may be asked for these during routine inspections or in the event of a radiation emergency.

143 Where the consequence assessment forms part of the risk assessment required under MHSWR, for operators with more than five employees, MHSWR requires the significant findings of the risk assessment to be recorded, kept up to date, and discussed with affected persons. The record should show a clear and transparent process, resulting in an auditable and demonstrable trail for how the information in the on-site emergency plan and the Consequence Report has been established.

144 The process and record of the findings of the assessment should be sufficient for the relevant regulator to be able to confirm the conclusions reached and be subject to the operator's administrative document control.

145 If the hazard evaluation or consequence assessment leads the regulator to conclude that the consequence assessment is not adequate or is insufficient, and there may be a risk of a radiation emergency arising from the work activities, the regulator may require a further assessment to be carried out. This further assessment may for example be expected to address uncertainties in the methodologies used and the impact of those uncertainties on the effectiveness of protective action taken to prevent and control any potential radiation emergency.

Regulation 6 Review of hazard evaluation and consequence assessment

Guidance 6

146 Regulation 6 requires operators to review, and revise where necessary, their evaluation and assessment made under regulation 4 and 5 whenever a material change to the work with ionising radiation is planned, or is recognised to have consequentially taken place, and periodically within 3 years of the date of the last assessment. This assessment will identify any new hazards, or changes to the hazards already identified, that have the potential to cause a radiation emergency, and the consequences should the radiation emergency occur.

147 Planned material changes usually occur as management decisions to change existing work or introduce new work with ionising radiations. Consequential material changes usually occur either in unplanned circumstances, such as changes to quantities or the physical form of radioactive materials in complex processes, or separate to the actual work with ionising radiation, such as changes in the way hazards and/or consequences are identified or evaluated.

148 The purpose of this review is to ensure that the hazard evaluation and consequence assessment continue to accurately reflect the activities being undertaken on the premises.

149 Operators should therefore consider the possible impact of any proposed modification to their facility, to the inventories held, or to the working practices undertaken to determine whether these *could* cause a material change. Where this is considered to be the case, the hazard evaluation and consequence assessment must be revised to ensure this continues to accurately reflect the risk from the work with ionising radiation on the premises.

150 Operators should also remain aware of any external developments that may affect the consequence assessment, such as the latest confirmed scientific evidence in respect of, for example, the effects of ionising radiation on humans (including introduction of revised radiation weighting factors), or transfer of radionuclides in the environment. It is the operators' responsibility to ensure that the hazard evaluation and consequence assessment reflect current national and international standards.

151 The requirements for the retention of the written evaluation and assessment made under regulations 4 and 5 continue to apply.

Regulation 6(1-4)

(1) Where the operator proposes a material change, or where a material change occurs, in the work with ionising radiation to which an operator was required to make an evaluation pursuant to regulation 4(1), the operator must make a further assessment to take account of that change.

(2) For such time as the work with ionising radiation in respect of which an evaluation made pursuant to regulation 4(1) continues, the operator must, within 3 years of the date of the completion of the last evaluation (whether made in accordance with regulation 4(1) or this paragraph), or longer, if agreed by the regulator, either—

(a)make a further evaluation; or

b) if there is no change of circumstances which would affect the last consequences report required by regulation 7, make a declaration to that effect.

(3) Where a declaration is made in accordance with paragraph (2)(b), a copy of that declaration must be provided to the local authority and to the regulator, within 28 days of the making of the declaration.

	(4) The further evaluation required by this regulation must comply with the provisions of regulation 4(2) to (4), and regulation 5, where applicable.
ACOP 6(1-4)	**152 Operators should consider a 'material change' as a change in their work with ionising radiation which has the potential to change the nature or scope of the hazards associated with the work in a way that may require amendments to:** **(a) the operator's arrangements for the prevention of radiation emergencies or mitigation of the consequences of radiation emergencies;** **(b) the operator's emergency plan; or** **(c) the local authority's off-site emergency plan.** **153 A record of the further assessment and evaluation made under 6(1) and 6(2)(a) should either take the form of updates to the previous hazard evaluation details and consequence records sent to the regulator under regulations 4(6) and 7(7) respectively, or provide new such records for the premises.** **154 The declaration under 6(2)(b) should be a formal statement that there has been no change in circumstances which would affect the previous hazard evaluation details and last consequences assessment required by regulations 4(6) and 7(7), and also that the previous consequence report under regulation 7(3) continues to apply.**
Guidance 6(1-4)	155 Operators should have written arrangements by which the impact of any modifications to the facility, working arrangements, operating parameters or external impacts are identified and considered. 156 If there is a material change in the work with ionising radiation it will be necessary for the operator to assess the impact of the change on their previous evaluation and assessment. For the purposes of REPPIR, such changes include, for example: (a) cessation of that work; (b) use of different radioactive substances; (c) use of different quantities of the same radioactive substances; (d) the decay of high-activity sealed sources to below the levels in Schedule 1; (e) use of different masses of fissile material; (f) changes in the physical form of the radioactive substances in use; (g) use of new or different technologies; (h) modifications to existing plant and/or technologies; (i) changes in safety management or safety-critical administrative procedures; (j) changes to values or application of international or national radionuclide dose coefficients; (k) identification of new hazards (internal and external hazards) to those previously identified; (l) Identification of different likelihoods of initiating events and/or the consequences; (m) new or different interpretations or assessment methodologies of existing hazards; (n) new environmental modelling or dose assessment techniques/ information; (o) the potential impact of any future proposed changes at or around the premises,

	such as significant additional building developments that may impact on the operator's assessment of the geographical extent of the consequences in regulation 5(1). For example, new urban developments in areas where there were not any before and hence no protective actions were recommended. The operator should be aware of such changes through liaison arrangements with the local authority. 157 In relation to the significant, progressive and sometimes continuous process of material changes during the decommissioning of nuclear facilities and premises, the operator may agree with the regulator a series of decommissioning hold points under this regulation whereby changes are considered to be material changes and further assessment is required. 158 Where reviews have been carried out it is important to ensure the revised evaluation and assessment have been recorded. Where a review identifies changes to the evaluation of the hazards, likelihood of occurrence, or assessment of the consequences, recording of these should be made either by updating the initial hazard evaluation and consequence records or suitably recording the additional findings. 159 Unless the operator judges they are needed more frequently, periodic reviews of evaluations and assessments must take place within 3 years of the date of the last evaluation and assessment respectively. 160 The written records, updates or statement made should be kept for the period of their applicability and for at least 3 years from the date on which they were made. If updates or statement pertaining to the previous records are produced, the previous records should also be retained for at least a further 3 years.

Regulation 7	**Consequences report**
Guidance 7	161 Regulation 7 requires the operator to prepare a consequence report presenting the conclusions of the consequence assessment performed under Regulation 5(1) and to send it to the local authority and the regulator. The consequence report should include a proposed minimum area for detailed emergency planning. It also requires the operator to discuss the results of the consequence analysis with the local authority and to provide a copy of the details of the assessment to the regulator.
Regulation 7(1-2)	*(1) Where the operator has made an assessment pursuant to regulation 5(1) or a review in accordance with regulation 6(1) or 6(2), unless regulation 6(2)(b) applies, the operator must prepare a report setting out the consequences identified by that assessment, called a consequences report, as soon as reasonably practicable on completion of the assessment.*
Guidance 7(1-2)	162 Further guidance on the requirement under Regulation 7(2) to set out in the consequences report any minimum geographical area from the premises that should be covered by the local authority's off-site emergency plan is provided below in Schedule 4 and its associated guidance.
Regulation 7(2-5)	*(2) The operator must send the consequences report to the local authority—* *(a) before the start of any of the work with ionising radiation to which the assessment relates;* or

	(b) where the report is as the result of a review in accordance with regulation 6, as soon as practicable after completion of the report. *(3) A consequences report must include the particulars set out in Schedule 4.* *(4) Following receipt of the consequences report by the local authority, the operator must, within a reasonable period of time, offer a meeting to the local authority to discuss the consequences report.* *(5) The operator must comply with any reasonable request for information made by a local authority, following receipt of the consequences report, required by the local authority to enable it to prepare the off-site emergency plan which it is required to prepare under regulation 11, within 28 days of the date on which that information was requested.*
Guidance 7(6-7)	163 Guidance on the need for co-operation between the operator and the local authority is provided in the guidance for Regulation 13.
Regulation 7(7)	*(7) The operator must provide the regulator with details of the assessment made under regulation 5 and the consequences report within 28 days of the date on which the consequences report is sent to the local authority.*
ACOP 7(7)	**164 The details of the assessment to be provided to the regulator should include the following particulars, where they are relevant:** **(a) the name and address of the operator;** **(b) the results of the assessment against the risk framework;** **(c) details of the atmospheric dispersion analysis;** **(d) the results of the radiological consequence assessment used to determine the recommended minimum area for detailed emergency planning;** **(e) the results of the radiological consequence assessment used to determine the recommended minimum geographical area for outline emergency planning where required to perform the determination required under 9(1)(b), or in the case of civil nuclear operators covered under Regulation 9(1)(a) for comparison against the default distance specified in Schedule 5 for the purposes of proposing a change under Regulation 9(2;** **(f) an assessment of the area likely to be affected by the dispersal of any radioactive substance and the period of time the dispersal is likely to take place;** **(g) an assessment of the likely exposures to ionising radiation of any person or class of persons as a result of any radiation emergency; and** (h) **an assessment of the necessity for an emergency plan to be prepared by the operator.**
Guidance 7(7)	165 All operators must send a copy of the assessment report to the relevant regulator (see regulation 2) within 28 days of completing the assessment. The operator may choose to combine the assessment report with the report of the hazard evaluation prepared under Regulation 4(6). 166 The assessment report should contain the details required from (a) to (h) as described. The reports submitted should contain sufficient information and cross references for the relevant regulator to be able to confirm the conclusions reached. 167 The documentation should also have been subject to appropriate document control procedures before issue. As noted in the guidance for Regulation 4(5), where the requirements complied with under the 2017 Regulations or NIA satisfy equivalent

	requirements under REPPIR it will not be necessary to duplicate information. Instead the relevant documents may be cross referenced within the copy of the report of the assessment.

Regulation 8 Detailed emergency planning zones

Regulation 8(1)	*(1) The local authority must determine the detailed emergency planning zone on the basis of the operator's recommendation made under (paragraph 2) of Schedule 4 and may extend that area in consideration of.* *(a) local geographic, demographic and practical implementation issues;* *(b) the need to avoid, where practicable, the bisection of local communities; and* *(c) the inclusion of vulnerable groups immediately adjacent to the area proposed by the operator.*
ACOP 8(1)	**168 The detailed emergency planning zone should provide an effective response to a range of radiation emergencies. It should be based on the minimum geographical extent proposed by the operator in the consequences report and should:** **(a) be of sufficient extent to enable an adequate response to a range of emergencies; and** **(b) reflect the benefits and detriments of protective action by considering an appropriate balance between dose aversion and implementing protective action in a radiation emergency across too wide an area which could divert important resource from the affected areas which require the most attention.** **169 In defining the boundary of a detailed emergency planning zone, the use of practical geographic features may be beneficial for ease of implementing the local authority's off-site emergency plan. Physical features such as roads, rivers, railways or footpaths should be considered as well as parish or postcode boundaries, particularly where these features and concepts correspond with other local authority emergency planning arrangements.**
Guidance 8(1)	170 The detailed emergency planning zone is a defined zone around premises within which emergency arrangements are planned in detail and can be readily implemented providing prompt protection to those who are likely to be affected by any radiation emergency. These arrangements should be identified in the off-site plan as per Schedule 6, Part 2, Chapter 1. 171 The zone should be set as the minimum area the operator considers should be covered by the local authority's off-site plan as per regulation 7(2) as well as by the local authority applying local geographic, demographic and practical implementation issues. 172 The operator has a duty as per regulation 7(2) to set out any minimum geographical extent which it considers should be covered by the local authority's off-site plan. The local authority is not expected to have the technical expertise to be able to verify the technical basis for the minimum extent set by the operator. 173 The zone will be determined by the local authority based on their knowledge of the local area and understanding of emergency planning in that area. The determination of the zone should consider properties which may fall beyond a natural boundary but it would be necessary to enter the detailed emergency planning zone to evacuate.

	174 An adequate response should meet the requirements in the Regulations to mitigate a radiation emergency and have the capability available to ensure this happens without unnecessary delay. If it is considered by the operator that the local authority has increased the detailed emergency planning zone excessively such that the increase is detrimental to the effectiveness of the off-site plan, this should be discussed with the local authority. If a resolution cannot be reached, this should be reported to the regulator. 175 Protective action does not need to be applied equally across the detailed emergency planning zone. It may be appropriate for some protective action to be applied closer to the premises that are not necessary at greater distances. 176 Vulnerable groups include those that are less able to help themselves in the circumstances of an emergency and can include schools, hospitals, care homes, people with mobility difficulties, mental health issues, hearing and visual impaired etc. Those who cannot readily shelter (eg caravan and mobile home dwellers, campers, walkers, farmers, outdoor visitor attractions, etc.) are also considered to be vulnerable. 177 Other site specific factors should be considered on a case-by-case basis. These might include developments being undertaken on or around the site. Consideration should also be given as to whether or not the detailed emergency planning zone should include any adjacent or nearby premises working with ionising radiation to which these Regulations apply. 178 To determine the boundary of the detailed emergency planning zone, the local authority may adopt an approach as follows: a) review the consequences report provided by the operator; b) consider the radiological implications for the public located around the specific site and the most appropriate means of protection of them in relation to the types of radiation emergency identified by the operator and likely exposure pathways. c) produce proposed detailed emergency planning zone maps based on the consequences report, current planning arrangements and local geographic, demographic and practical implementation issues identified; and d) liaise with relevant organisations to identify any issues or improvements to the detailed emergency planning area boundary/boundaries (for example emergency responders, experts in emergencies and responses, regulators, PHE, operator, adjacent local authorities). Existing local forums and liaison committees already set up to discuss emergency arrangements could be utilised for this purpose. 179 Where information which may be sensitive (eg. commercially or for security reason) is provided to the local authority by the operator to inform the determination, any appropriate security requirements with respect to handling of this information should be followed.
Regulation 8 (2)	*(2) However, the local authority and operator may agree that, in relation to the premises, other arrangements are in place which sufficiently mitigate the consequences of the radiation emergency, and that no detailed emergency planning zone is necessary.*
Guidance 8(2)	180 Operators who have duties under other legislation (such as COMAH) may have arrangements in place which satisfy the requirements of regulation 8(1). In order to justify current arrangements are sufficient, the operator should demonstrate that they have complied with the requirements of Regulation 4(4).
Regulation 8(3)	*(3) The local authority must inform the operator and the regulator, within two months of having received the consequences report under regulation 7, of the determination made under paragraph (1).*

ACOP 8(3)	**181 The information provided to the operator and the regulator by the local authority of the determination of the detailed emergency planning zone should include:** **(a) a description of the area;** **(b) a map showing the extent of the area; and** **(c) suitable basis for the determination including any pockets of detailed planning within the outline planning zone as per Schedule 6, Part 2, Chapter 2, 3(b)(ii).**
Guidance 8(3)	182 The local authority should also inform other relevant parties of the determination as appropriate. This may include, for example, the Defence Nuclear Safety Regulator, Government department, Welsh Government, Scottish Government, Nuclear Decommissioning Authority, Food Standards Agency, MCA, PHE, Harbour Master, the Agency and any others). 183 Upon receipt of the consequence report from an operator, the local authority has two months within which to complete their determination of the detailed emergency planning zone. For new operators within the scope of these Regulations, premises which may have a detailed emergency planning zone for the first time, and premises where a revised consequence report recommends a change to the geographical extent of the zone, operators should engage with the local authority as early as possible in the process, and where possible, significantly prior to sending the completed consequence report. 184 The local authority will have 6 months from the point of setting a detailed emergency planning zone to develop and implement arrangements to bring into effect an emergency plan in the event of a radiation emergency as per regulation 11(4).
Regulation 8(4)	*(4) Where the local authority and the operator have agreed that no detailed emergency planning zone is necessary in accordance with paragraph (2), the local authority must inform the regulator as soon as reasonably practicable.*
Guidance 8(4)	185 The decision that there is no requirement for a detailed emergency planning zone should be reported to the regulator and suitable justification for the decision should be provided. 186 The regulator must be informed of this decision within two months of the local authority having been sent the consequences report under regulation 7.
Regulation 8(5)	*(5) On receipt of the local authority's confirmation of the detailed emergency planning zone, the operator must record the detailed emergency planning zone as finalised.*
Guidance 8(5)	187 The operator may record the finalisation of the detailed emergency planning zone in the consequences report or using another means as appropriate.
Regulation 8(6)	*(6) The local authority may re-determine the detailed emergency planning zone -* *(a) if there is a change in the local area which necessitates such a re-determination; or* (b) *if the local authority deems it appropriate as a consequence of the operator's consequences report made after an evaluation in accordance with regulation 6(1) or 6(2)(a).*
ACOP 8(6)	**188 In order to understand if there has been a change in the local area which necessitates a re-determination, the local authority should consider planning applications within or immediately adjacent to the detailed emergency planning**

	zone taking into account their potential impact on the effectiveness of the emergency plan. **189 Re-determination of the detailed emergency planning zone should follow the approach set out under regulation 8(1)-(5).**
Guidance 8(6)	190 A change in the local area may include: (a) a significant planning development within or immediately adjacent to the local area which may impact on those factors in regulation 8(1) considered by the local authority when determining the detailed emergency planning zone ; (b) changes to the distribution of or addition of new vulnerable groups; (c) changes to the infrastructure facilitating an emergency plan (e.g. new roads); or (d) changes effecting the responders facilitating an emergency plan (e.g. new or closed fire station, new or closed hospital, reduced services such as closing an A&E department). 191 Receipt of the consequences report from the operator made after an evaluation in accordance with regulation 6(1) or 6(2)(a) may also prompt a review of the detailed emergency planning zone.
Regulation 8(7)	*(7) If the local authority re-determines the detailed emergency planning zone in accordance with (paragraph 6), it must inform the operator and regulator as soon as reasonably practicable.*
Guidance 8 (7)	192 Re-determination of the detailed emergency planning zone should follow the approach set out under Reg 8(1)-(5) above and the supporting ACOP and guidance. 193 The local authority should inform the operator and regulator as soon as reasonably practicable when consideration is being given to re-determining the detailed emergency planning zone to ensure they are aware of any pending changes.

Regulation 9 Outline planning zone

Regulation 9(1)	*(1) The outline planning zone must be determined as follows—* *(a) in relation to a site for which the Office for Nuclear Regulation is the regulator, except for—* *(i) an authorised defence site,* *(ii) a nuclear site, or* *(iii) a site which is a licensed site where that license has been granted either to the Secretary of State for Defence or to another person in relation to activities carried out by that person on behalf of the Secretary of State for Defence,* *in accordance with Schedule 5.* *(b) in relation to a site for which the Health and Safety Executive is the regulator, by the local authority following discussion with the operator;* *(c) in relation to any other site, including the sites listed at sub-paragraph (a)(i) to (iii), by the Secretary of State.*

Guidance 9(1)	194 Outline planning builds on the arrangements and capabilities within existing emergency plans to provide commensurate planning for low probability events up to and including unforeseen events. Where a site has a detailed emergency planning zone as per regulation 8(1), outline planning operates at distances beyond the detailed emergency planning zone but can also be undertaken within the detailed emergency planning zone (i.e. in the case that some protective action may not be required in the detailed emergency planning zone except for severe accidents). Where a site does not have a detailed emergency planning zone and an outline planning zone is required, outline planning operates from the site boundary. 195 The determination of an outline planning zone should assist the local authority in planning for extremely unlikely but more severe events. The central aim of the outline planning zone is to support the decision making of emergency responders in the event that detailed or generic arrangements are not sufficient. Outline planning is therefore about identifying what protective action may be needed at a high level and where those capabilities could be obtained from and the anticipated time frame over which they will become available, rather than having them in place ready to mobilise without delay. 196 There may be pockets of detailed planning within the outline planning zone as described in Schedule 6, Part 2, Chapter 2, 3(b)(ii). 197 There may be some cases where a detailed emergency planning zone is required but no outline planning zone is necessary. This could occur, for example, where the impact of a severe accident is close to the site and the nature of the event means that it does not warrant emergency arrangements being in place at greater distances (eg. criticality). 198 For all civil nuclear, defence and HSE regulated sites, the operator's description of the geographical extent for the outline planning zone should be a circular radial distance (km) with the centre point clearly indicated. For premises with multiple facilities located around a site and potentially a number of centre points, the operator should describe one overall radial extent that encompasses all facilities. 199 The extent of the outline planning zone must be recorded in the off-site emergency plan under Schedule 6, Part 2, Chapter 3 (5). **Civil Nuclear Sites** 200 In relation to a site falling within paragraph (1)(a), premises are categorised in Schedule 5. These premises have default distances from the site which should have outline planning as part of the local authority off-site emergency plan under regulation 11. 201 Categories have been set based on scientific modelling covering less likely and more severe events using the assessment approach set out in Schedule 3 and considering certain factors including: (a) international comparisons for outline planning; (b) the practical ability for a site and local authority to plan and respond effectively at greater distances; and (c) the need for proportionate planning, given that these events are extremely unlikely. 202 If an operator of a site falling within paragraph (1)(a) believes that they should have an outline planning zone but there is no default planning distance specified in Schedule 5, the operator can propose an outline planning zone distance to the regulator and the Secretary of State as per regulation 9(2). Such a proposal might be as a result of the findings of the consequence assessment undertaken by the operator as required in regulation 5(1).

	203 The appropriate distance for outline planning taken from Schedule 5 must be set out by the operator in the consequences report under Schedule 4, Part 2(a). **HSE regulated sites** 204 In relation to a site falling within paragraph (1)(b), the requirement for an outline planning zone will be assessed by the local authority in conjunction with the operator. Where the premises presents a potential for an annual effective dose greater than 1 mSv to a member of the public following a radiation emergency, a discussion as to whether or not outline planning is required should take place between the local authority, the operator and any other responding organisations as appropriate. This discussion should be prompted by receipt of the consequences report by the local authority as required by regulation 7(3). 205 As the intent of outline planning is to build on existing emergency plans taking into account the consequences of the worst case radiation emergency identified by the operator, consideration should be given to the content and scope of existing emergency plans and whether existing arrangements and capabilities (eg. for the 2017 Regulations, COMAH, Civil Contingencies Act (CCA)) are sufficient. 206 It may be possible to justify that no outline planning zone is required as per 9(3). Consideration should be given as to how existing arrangements could be used or adapted for a radiation emergency. If more planning is required, the local authority should identify an appropriate outline planning distance based on the release scenario identified, existing planning arrangements and a proportionate response. 207 The discussions and conclusion should be recorded in such a way that allows for external verification. **Defence nuclear sites** 208 For the determination of outline planning zones as per (1)(c), the extent of the outline planning zones will be determined by the Secretary of State for Defence. 209 Distances are based on the scientific modelling of less likely, more severe events using the assessment approach set out in Schedule 3. The appropriate distance for outline planning will be provided to the operator by the Secretary of State for Defence and must be set out by the operator in the consequences report under Schedule 4, Part 2(a).
Regulation 9(2)	*(2) The regulator and the Secretary of State may agree, in relation to a site falling within paragraph (1)(a), that the site has an outline planning zone which is greater or smaller than that determined in accordance with Schedule 5.*
Guidance 9(2)	210 This decision should be made by the regulator and the Secretary of State on receipt of a written justification of the proposed change to the outline planning zone specified in Schedule 5 from the operator. 211 Where an operator believes that a default distance should be varied, they should analyse the less likely, more severe emergencies for a site and their consequences. This assessment will need to be carried out in an equivalent manner to how they were arrived at by applying the standardised consequences assessment approach set out in Regulation 5 (and its supporting ACOP and guidance) to less likely, more severe events, including unforeseen events.

	212 In consultation with the local authority, the operator will also need to consider all of the following: • international comparisons for outline planning; • the practical ability for a site and local authority to plan and respond effectively at greater distances; and • the need for proportionate planning, given that these events are extremely unlikely. 213 Sites identified in paragraph (1)(a) may move between categories. This may occur for example if the site changes its activities in some way or is decommissioned and the risk is reduced. Such a change is a material change requiring compliance with regulation 6(1). 214 Until agreement has been reached between the regulator and the Secretary of State about the appropriateness of a proposed outline planning zone distance that differs from the default distances in Schedule 5, the operator should comply with the default distance applicable to their site. 215 When default distances are used, planning arrangements do not need to extend beyond these distances and no justification of the outline planning zone distance is required by the operator.
Regulation 9(3)	*(3) The operator and the local authority may propose in relation to a site falling within paragraph (1)(b), that the site has no outline planning zone.*
ACOP 9(3)	**216 Where an outline planning zone is not considered necessary, the justification for the decision should be recorded by the operator in writing. This decision should reflect the results of the operator's hazard evaluation and consequence assessment as required by regulations 4 and 5 and Schedule 3 and take into account whether existing arrangements and capabilities (eg. for the 2017 Regulations, COMAH, CCA) are sufficient.**
Regulation 9(4)	*(4) The planning to be undertaken by the local authority in relation to the outline planning zone must be commensurate to the risk of a radiation emergency affecting that area, and the local authority's off-site emergency plan required under regulation 11 must clearly set out when that plan would be brought into effect in relation to the outline planning zone.*
Guidance 9(4)	217 Planning in the outline planning zone should only include strategic arrangements and considerations that would be necessary as the tactical and operational arrangements will be developed on the day. These plans should build on the capability of plans that exist for either a radiation emergency or generic emergency planning arrangements that exist for other hazards. Outline emergency planning arrangements should be uniform across the outline planning zone. 218 Like detailed planning, outline planning should also reflect the benefits and the detriments of protective action by considering an appropriate balance between dose aversion and implementing protective action in a radiation emergency. 219 Where it is identified that outline planning is required, appropriate emergency planning arrangements should be identified in the local authority's off-site plan as required by regulation 11(1). In cases where existing arrangements are already in place covering part or all of the identified outline planning requirements, it is not necessary to repeat these arrangements in the local authority's off-site plan. Instead the off-site plan

	should act as a signpost to these. 220 More details about the information that should be included in an off-site emergency plan are contained in regulation 11 (3) and Schedule 6. 221 The requirements specified in regulation 17 regarding the implementation of emergency plans apply to outline planning. 222 Where the magnitude of the release warrants it, the upper ERL may also be considered by the local authority for planning for urgent protective actions for sites located in populated areas or where severe radiation emergency has a low likelihood of occurrence and is being assessed for outline planning purposes.

Regulation 10	**Operator's emergency plan**
Regulation 10(1)	*(1) Where the operator has made an evaluation in accordance with regulation 4(1) which shows that a radiation emergency might arise, the operator must make an adequate 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 radiation emergencies identified by the evaluation.*
ACOP 10(1)	**223 For the operator's emergency plan to meet the legal requirement to be adequate, the operator should prepare the plan in accordance with the requirements of this regulation and the associated Schedules and should ensure the plan:** **(a) is a written document, or set of documents; and** **(b) is capable of being put into effect without delay when required by:** **(i) providing the necessary information, instruction and training and making the necessary equipment available, in accordance with regulation 10(7); and** **(ii) ensuring any other underpinning capabilities required to implement the plan are in place and readily available.**
Guidance 10(1)	224 The operator's emergency plan should be a written document, or set of documents, detailing how any radiation emergency, or any event which might lead to a radiation emergency, will be managed. This is applicable to all radiation emergencies, including unforeseen events, although the level of planning should be undertaken in a proportionate manner dependent on the hazards identified under the regulation 4 evaluation and the potential consequences of these radiation emergencies. The operator's emergency plan does not distinguish between detailed and outline planning but in the case of unforeseen events the operator may have existing plans and strategies in place which can form part of the operator's emergency plan. 225 In order to protect persons 'who may be affected' by the radiation emergency the operator's emergency plan should include the necessary on-site action to respond to the emergency, including the action required to reduce or stop the effects of the radiation emergency. The operator's and off-site emergency plans should dovetail with one another, so co-operation is required between the operator and local authority (see regulation 13).

	226 The operator's emergency plan covers all key operator action on-site and should refer to the action taken by external organisations in the provision of on-site support in the event of a radiation emergency. It should also include operator action for assisting with the emergency response off-site, for example arrangements for alerting off-site organisations and assisting with off-site monitoring. 227 The duty to prepare the operator's emergency plan for premises is placed on the operator (although the operator of a berth or transit shed may need the assistance of the consignor in preparing the plan). 228 The process for making an adequate plan involves: (a) writing the plan, including the minimum content required by Schedule 6 and meeting the principles and purposes in Schedule 7; (b) implementing the necessary requirements to ensure the plan can be put into effect without delay when required (see ACOP 223); (c) testing the plan to demonstrate its adequacy; and (d) making any necessary improvements to the plan as identified by the test. 229 Maintaining the adequacy of the plan is an on-going process involving review, revision and testing. For further guidance on this see regulation 12. 230 Operators who prepare emergency plans and contingency plans under other legislation, such as COMAH, the 2017 Regulations, NIA (nuclear site licence condition 11) or Dangerous Goods in Harbour Areas Regulations 2016 (DGHAR) (for berth operators at ports) may choose to prepare an integrated operator's emergency plan covering a range of radiation and chemical or other hazards. An adequate operator's emergency plan could, therefore, satisfy the requirements of more than one set of regulations. Where this approach is taken, the relevant regulator(s) may need to be informed, for example in the case of COMAH, the Competent Authority (which includes the Agency) should be informed. 231 Similarly, transit shed operators at airports will need to co-operate with airport operators' contingency plans drawn up under CAP 168. Operator's emergency plans prepared under REPPIR could help transit shed operators achieve this, if only partially. (Also see paragraph 389 under regulation 15 regarding co-operation relating to berth and transit shed operators.) For the purposes of REPPIR the operator's emergency plan, whether or not it is an integrated plan as described above, should be made on the basis of the full range of hazards which may cause a radiation emergency and satisfy all the relevant requirements in these Regulations. 232 An operator may need to consider the hazards and consequences, and the associated emergency arrangements, for any adjacent or nearby premises which could give rise to a radiation emergency and consider the benefit in joint planning or agreeing mutual support arrangements. Similarly, in the case of operator's emergency plans relating to multi-occupancy premises, such as industrial estates, berths or transit sheds, the benefits of joint planning between all relevant operators should be considered. 233 The operator should seek advice on radiation protection, as appropriate, at all relevant stages of the emergency planning process and must consult a Radiation Protection Adviser (RPA) in accordance with regulation 24.
Regulation 10(2)	*(2) When preparing an emergency plan, as required by paragraph (1), the operator must take into account—* *(a) the steps the operator has taken under regulation 4(4); and*

	(b) the consequences assessed in accordance with regulation 5, including any variable factors which might affect the severity of the emergency.
ACOP 10(2)	**234 The operator should consider the following variable factors, where they are relevant:** **(a) aspects of the Schedule 3 requirements used in consequence assessments;** **(b) conditions in the affected facility, conditions affecting infrastructure or conditions affecting several facilities at once;** **(c) availability of personnel; and** **(d) multiple factors which could materialise in parallel.**
Guidance 10(2)	235 Operators must take into account any variable factors which may affect the consequences of a radiation emergency and consider the impact on planning assumptions. This is to ensure the emergency plan is flexible enough to respond to a range of potential scenarios in order to restrict exposure to ionising radiation and to secure the health and safety of persons who may be affected by the radiation emergency so far as is reasonably practicable. 236 Variable factors which should be considered as a minimum are listed in ACOP paragraph 234. Conditions may include, for example, reduced access or visibility in the facility or loss of power or other services. Such conditions could adversely affect the operator's ability to reduce or stop the release of radiation and could be caused by natural, human induced or other events, for example by extreme weather or earthquakes. The operator's emergency plan should consider the different levels and possible reductions in staffing levels at different times, for example at night, weekends and during holidays etc. or where the number of personnel able to reach the site is reduced due to the wider consequences of the event. 237 The operator's emergency plan should take reasonable account of the range of variability in the factors identified. The plan should take into account how variable factors could materialise and affect the ability of protective action to restrict exposure to ionising radiation and the health and safety of persons who may be affected by radiation emergencies and set out the action to address such changes. This is to ensure that the plan is capable of producing an effective response in a range of scenarios. The operator's emergency plan should be capable of responding to the particular characteristics of an emergency as those characteristics emerge so arrangements should be in place to promptly anticipate and assess the characteristics (see Schedule 7 Part 1).
Regulation 10(3)	*(3) The operator's emergency plan must—* *(a) contain the information set out in Part 1 of Schedule 6; and* (b) *be drawn up in accordance with the principles and purposes set out in Schedule 7.*
Guidance 10(3)	238 For further guidance on the information to be included in the operator's emergency plan, see guidance to Schedules 6 and 7.
Regulation 10(4)	*(4) The operator must not require any person to carry out work with ionising radiation, and no person shall carry out such work unless—* *(a) the operator has complied with the requirements of paragraph (1); and* *(b) the local authority has complied with its duties in connection with the off-site emergency plan as set out in regulation 11, and has confirmed this to the operator in writing.*

Guidance 10(4)	239 Regulation 11(7) requires the local authority to confirm in writing to the operator that it has prepared its plan as soon as reasonably practicable. 240 For transitional provisions when REPPIR comes into force see regulation 28. 241 For a new operator, work with ionising radiation should not begin until both emergency plans have been tested to demonstrate their adequacy (see ACOP paragraph 223)
Regulation 10(5)	*(5) The operator must, when preparing the emergency plan, or reviewing it under regulation 12(1), consult—* *(a) the operator's employees;* *(b) any persons carrying out work on behalf of the operator and who the operator considers might be affected by a radiation emergency;* *(c) the lead local authority;* *(d) the health authority in whose area the premises to which the emergency plan relates is situated;* *(e) Public Health England;* *(f) in addition to Public Health England, if the premises to which the emergency plan relates is in—* *(i) Wales, Public Health Wales, and* *(ii) Scotland, Health Protection Scotland;* *(g) the Category 1 responders in whose area in which he premises to which the emergency plan relates is situated; and* *(h) such other persons, bodies or authorities as the operator considers appropriate.*
Guidance 10(5)	242 The purpose of consultation is to engage with and take account of relevant parties' views during the preparation, review and revision of the operator's emergency plan, so that it is as effective as it can be. Further guidance on consultation and co-operation can be found under regulations 13 and 15. 243 The operator will determine the appropriate means of consultation. Iterative consultation may be appropriate in developing the plan and the operator may consider using digital tools and open, collaborative approaches. Consulting in the earlier stages of development may be appropriate to allow consultees to influence the plan more effectively and efficiently. 244 Consultees should be given an appropriate amount of time to review and form meaningful views on the proposals. Consulting for too long will unnecessarily delay development of the plan but consulting too quickly will not give enough time for consideration and will reduce the quality of responses. 245 The operator should consider the views provided and any evidence presented as part of the consultation process. 246 All organisations with a role in the operator's emergency plan should be consulted to reach agreement on the role that they would perform in the event of a radiation emergency. 247 Employees identified as having a role to play in the emergency response to a radiation emergency must be consulted. There are legal requirements to consult with employees under the Safety Representative and Safety Committees Regulations 1977 and the Health and Safety (Consultation with Employees) Regulations 1996.

	Consultation should also include others who normally work on the premises, for example contractors' employees. Consultation with employees and with contractors' employees may be direct or through appointed employee representatives. 248 Consultation with the lead local authority should help to enable adequate dovetailing with the off-site emergency plan (see paragraphs 360-368 for further guidance on reviewing interfaces between the plans). 249 The operator must consult the health authority for the area in the vicinity of their premises and inform them of the nature of the radioactive substances on the premises, so that the health authority can plan for the treatment of people who may be affected by a radiation emergency. Health authorities/ boards are responsible for ensuring that satisfactory arrangements are in place for handling the health care aspects of the response to a radiation emergency. This will include ensuring arrangements are in place with NHS trusts, and/ or hospital and emergency units responsible for managing primary and community care for the treatment of any casualties that may arise and determining, where appropriate, the most suitable storage locations for supplies of relevant stocks of health care products. 250 The operator should consult PHE, Public Health Wales or Health Protection Scotland, as appropriate, on matters affecting the public health response. PHE's Centre for Radiation, Chemicals and Environmental Hazards provides radiation protection functions in Scotland, England and Wales and the operator should consult it on public health matters relating to radiation protection. 251 Category 1 responders identified as having a role to play in the emergency response on the premises must be consulted and this should include consulting on the radiation protection arrangements for emergency services personnel responding to such an emergency (see regulation 18 on emergency exposures and regulation 24 on consulting a radiation protection adviser). 252 It may also be necessary to consult with other individuals or organisations who may be involved with or affected by the implementation of the operator's emergency plan (e.g. Category 2 responders). Berth or transit shed operators should consult with harbour authorities or airport operators on the operator's emergency plan.
Regulation 10(7)	*(6) The operator must ensure that any employee on site is or has been provided with such suitable and sufficient information, instruction and training as they require in relation to a radiation emergency.* *(7) The operator must ensure that any emergency worker 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;* *(b) any equipment necessary to perform the functions allocated to them by the operator's emergency plan; and* *(c) any equipment necessary to restrict their exposure to ionising radiation including, where appropriate, the issue of suitable dosemeters or other devices.* *(8) In the case of a person who is not employed by the operator, the information, instruction, training and equipment required by regulation (7) relates only to specialised equipment to be used on the operator's premises in accordance with the operator's emergency plan, and which is information, instruction, training or equipment the operator does not expect the person to have received or have available already.*

Guidance 10(7)	253 Regulations 10(6) – 10(8) require the provision of information, instruction, training and equipment and apply whether or not emergency exposures are likely (see guidance on regulations 18(1) (b) and (c) regarding training and equipment for employees who may be subject to emergency exposures). The provision of these requirements should be proportionate to the extent the employee is affected by the operator's emergency plan, for example those with a defined role in the plan will require a greater level of information, instruction and training than other employees on the premises. **Information, instruction and training for emergency workers** 254 The information, instruction and training provided to persons with a role in the operator's emergency plan should allow them to perform their role effectively in the event of a radiation emergency and enable their exposure to ionising radiation to be restricted, so far as is reasonably practicable. 255 The operator should provide information, instruction and training to emergency workers from off-site organisations who have a role in assisting with the on-site response. This should only cover information, instruction and training which is not provided by the off-site organisation but is required to enable them to perform their role in the plan effectively in the event of a radiation emergency and to facilitate joint working with the operator. This should cover, for example: (a) general information about the site and the nature of the potential hazards on-site; (b) specific information, instruction and/or training on the role of emergency workers from off-site organisations in the plan; (c) arrangements on-site in the event of a radiation emergency and how emergency workers from off-site organisations would interface with these arrangements; and (d) what equipment is available on-site for emergency workers from off-site organisations to use, including details of where it is located and how it is used (training may also be required for this purpose). 256 The information, instruction and training should also include radiation protection arrangements so that off-site organisations can consider how they will interface with these arrangements on-site to enable their exposure to ionising radiation to be restricted so far as is reasonably practicable. **Information, instruction and training for other employees** 257 The operator should ensure that all other personnel working on their premises, including those of other employers, are given suitable and sufficient information and instruction on what to do in the event of a radiation emergency. The operator will also need to provide suitable and sufficient information and instruction, and where necessary training, to visitors who are on the premises. This may include patients attending or visiting hospitals, and students attending educational or research establishments. **General requirements for information, instruction and training** 258 The operator should ensure that information, instruction and training is kept up to date and reviewed regularly to ensure it remains current. It should also be repeated at an appropriate frequency to maintain competence levels. Training records should be kept to identify when refresher training is needed. The operator should have arrangements in place to ensure that all individuals new to the premises are given suitable and sufficient information, instruction and training when they begin working on the premises. If there are any changes to the emergency arrangements, for example the introduction of new equipment, the relevant responders should be provided with further information and training.

	259 Information, instruction and training should be effective and the operator should check its adequacy. This could include requesting feedback from emergency workers and employees and reviewing capabilities, for example during the testing of emergency plans. The operator should ensure the training delivers its aims and objectives and, if not, make changes to the programme. **Equipment** 260 The operator should have arrangements for any equipment that has been identified in the operator's emergency plan to be available for all its employees who require use of such equipment in the event of a radiation emergency. In the case of emergency workers not employed by the operator, for example emergency services assisting on-site, the equipment provided by the operator should only be specialist equipment which the emergency worker is not expected to have access to as part of their routine role. 261 Equipment should be maintained, ready for use and kept in an accessible location. The operator should provide suitable information, instruction and/or training on the use of such equipment. 262 Personal protective equipment may be necessary to restrict emergency workers' exposure to ionising radiation and they should also be issued with suitable dosemeters, where appropriate. Some emergency workers may already be provided with routine dosimetry under the 2017 Regulations, and the operator should consider whether to make arrangements to include additional dosemeters in the event of a radiation emergency occurring (assuming that there is enough time to do this). Further guidance on dose assessments for employees who may receive emergency exposures can be found under regulation 18(1)(e).
Regulation 10(9)	*(9) An operator which has prepared an emergency plan in accordance with this regulation must—* *(a) review that plan as a consequence of any review required by regulation 6; and* *(b) update the plan, if necessary, as a consequence of a review undertaken in accordance with sub-paragraph (a).*
Guidance 10(9)	263 Where the operator has made an assessment under regulation 6 to take account of a material change in the work with ionising radiation, a review of the plan will be required to identify any changes required as a result of the new assessment. 264 Information, instruction and training should also be reviewed and where necessary revised and any additional equipment should be provided. 265 Further guidance on reviewing emergency plans is available under regulation 12.
Regulation 10(10)	*(10) The operator must retain the emergency plan on the premises to which it relates, and must provide details of that plan to the local authority and the regulator upon request and within such reasonable time as the local authority or the regulator may request.*
Guidance 10(20)	266 The operator should ensure that an up to date copy of the operator's emergency plan is appropriately located on site and that it is readily available and accessible at all times to those with a role in the plan. It may be appropriate to hold multiple controlled copies on-site and to hold a copy at a location off-site in the event that an on-site copy is destroyed or inaccessible during a radiation emergency.

Regulation 11	**Local Authority's emergency plan**
Regulation 11(1-2)	*(1) Where premises require a planning zone under either or both of regulations 8 or 9, the local authority must make an adequate off-site emergency plan covering that zone or zones.* *(2) The plan required by paragraph (1) must be designed to mitigate, so far as is reasonably practicable, the consequences of a radiation emergency outside the operator's premises.*
ACOP 11(1)	**267 For the off-site emergency plan to meet the legal requirement to be adequate, the local authority should prepare the plan in accordance with the requirements of this regulation and the associated Schedules and should ensure the plan:** **(a) is a written document, or set of documents; and** **(b) is capable of being put into effect without delay when required by ensuring that prior information has been supplied in accordance with regulation 21 and by seeking assurances, so far as reasonably practicable, from organisations with a role in the plan that:** **(i) the necessary information, instruction and training has been provided and the necessary equipment for restricting exposure has been made available, in accordance with regulation 11(6);** **(ii) any equipment required to implement the plan has been made available by the operator in accordance with regulations 10(7) and 10(8) or the relevant organisation; and** **(iii) any other underpinning capabilities required to implement the plan are in place and readily available.**
Guidance 11(1-2)	268 The off-site emergency plan, so far as it covers any detailed emergency planning zone, should set out detailed planning arrangements to provide prompt protection of the public in this area. There should be a proportionate approach to the degree of planning in the off-site emergency plan in relation to any outline planning zone and the plan may refer out to generic emergency planning arrangements for outline planning, where appropriate. 269 A local authority should prepare a written off-site emergency plan for any premises in their area with a detailed emergency planning zone and/or an outline planning zone as determined under regulations 8 and 9 respectively. One off-site emergency plan should be prepared covering both the detailed emergency planning zone and the outline planning zone as appropriate. The local authority with responsibility for preparing the off-site emergency plan is the lead local authority. 270 The off-site emergency plan should cover all external organisations' activities, both those off-site and those helping with on-site mitigatory action. The local authority and the operator should co-operate to ensure that the plans dovetail with one another (see regulation 13). 271 The process for making an adequate plan involves:

(a) writing the plan, including the minimum content required by Schedule 6 and meeting the principles and purposes in Schedule 7;
(b) implementing the necessary requirements (or seeking assurance of this) to ensure the plan is capable of being put into effect without delay when required;
(c) testing the plan to demonstrate its adequacy; and
(d) making any necessary improvements to the plan as identified by the test.

272 The local authority should seek assurance, to the extent possible, from other organisations with a role in the off-site emergency plan that the underpinning capabilities required to implement the plan are in place and readily available, for example by asking for written confirmation of this when consulting on and reviewing the plan. The underpinning capabilities are those referred to in paragraph 267 and other capabilities could include, for example, the organisation's own supporting plans and procedures. Regulation 15(3) requires employers of employees with a role in the plan to co-operate with the local authority.

273 Maintaining the adequacy of the plan is an on-going process involving review, revision and testing. For further guidance on this see regulation 12.

274 When preparing the off-site emergency plan, the local authority should plan to mitigate the consequences of the emergency on the basis of the information provided by the operator through:
(a) the consequences report (regulation 7);
(b) any meeting held with the local authority to discuss the consequences report (regulation 7(4)); and
(c) any reasonable request for information made by the local authority (regulation 7(5)).

275 The lead local authority may request the co-operation of another local authority in preparing the off-site emergency plan (see regulation 14) and any employer of any person whose participation is reasonably required by the off-site emergency plan also has duties to co-operate with the lead local authority (see regulation 15).

276 Local authorities who prepare emergency plans for the premises under other legislation, such as COMAH, may choose to prepare an integrated off-site emergency plan covering a range of radiation and chemical or other hazards. An effective off-site emergency plan could, therefore, satisfy the requirements of more than one set of regulations. Where this approach is taken, the relevant regulator(s) may need to be informed, for example in the case of COMAH, the Competent Authority (which includes the Agency) should be informed.

277 The local authority may also need to consider the hazards and consequences, and the associated emergency arrangements, for any adjacent or nearby premises which could give rise to a radiation emergency and consider the benefit of the off-site emergency plan covering more than one site. Similarly, in the case of off-site emergency plans relating to multi-occupancy premises, such as berths or transit sheds, the plan would need to take into account all relevant operators on the premises (see regulation 15 guidance paragraph xxx on consultation and co-operation).

278 Off-site emergency plans prepared for nuclear powered vessels that form separate premises would cover the areas surrounding the relevant berths or fixed point moorings, including areas of estuaries, rivers or sea lochs in the vicinity of berths or moorings. Where such berths or fixed point moorings are within a nuclear licensed site or MOD controlled premises, then nuclear powered vessels are considered as part of that site or premises (see paragraph 18 on the definition of 'premises' in regulation 2).

Regulation 11(3)	*(3) The off-site emergency plan must—* *(a) contain the information set out in Chapter 1 of Part 2 of Schedule 6 about the detailed emergency planning zone (where there is a detailed emergency planning zone);* *(b) contain the information set out at Chapter 2 of Part 2 of Schedule 6 about the outline planning zone (where there is an outline planning zone);* *(c) comply with Chapter 3 of Part 2 of Schedule 6; and* *(d) be drawn up in accordance with the principles and purposes set out in Schedule 7.*
Guidance 11(3)	279 For further guidance on the information to be included in the off-site emergency plan, see guidance to Schedules 6 and 7.
Regulation 11(4)	*(4) The off-site emergency plan must be prepared within 8 months of the local authority's receipt of the consequences report and in any event before the operator commences work with ionising radiation to which the evaluation made in accordance with regulation 4(1), 6(1) or 6(2) applies.*
Guidance 11(4)	280 The local authority must prepare the off-site emergency plan within 8 months of receiving the consequences report from the operator under regulation 7(3). Where there is a requirement for a detailed emergency planning zone, the local authority must determine the zone within two months of receiving the consequences report in accordance with regulation 8(3), leaving 6 months for the plan to be prepared. 281 The local authority must prepare and put into effect the off-site emergency plan and confirm its completion in writing to the operator and the regulator, in accordance with regulation 11(7), before the operator can start working with ionising radiation (see regulation 10(4)(b)).
Regulation 11(5)	*(5) In preparing an off-site emergency plan, pursuant to paragraph (1) or in reviewing such a plan pursuant to regulation 12(1), the local authority must consult—* *(a) the operator of the premises to which the plan relates;* *(b) Category 1 responders in whose area in which the premises to which the emergency plan relates is situated;* *(c) Category 2 responders (where appropriate) in whose area in which the premises to which the emergency plan relates is situated;* *(d) each health authority in the vicinity of the premises to which the plan relates (if that health authority is not a Category 1 responder);* *(e) the Agency;* *(f) Public Health England;* *(g) in addition to Public Health England, if the premises to which the emergency plan relates is in—* *(i) Wales, Public Health Wales, and* *(ii) Scotland, Health Protection Scotland; and* *(h) such other persons, bodies or authorities as the local authority considers appropriate.*

ACOP 11(5)(f)	**282 The local authority should consult PHE's Centre for Radiation, Chemical and Environmental Hazards to confirm its understanding of the following matters, where relevant, in addition to any other matters the local authority considers appropriate:** **(a) the planning of urgent protective action as part of the off-site mitigatory action required by Schedule 6, Part 2, Chapter 1(f);** **(b) the application of reference levels required by regulation 20; and** **(c) PHE's role in the off-site emergency plan.**
Guidance 11(5)	283 The purpose of consultation is to engage with and take account of relevant parties' views during the preparation, review and revision of the off-site emergency plan, so that it is as effective as it can be. Consultation should ensure that wider specialist knowledge and responsibilities are taken into account in developing and resourcing the off-site emergency plan. 284 The local authority will determine the appropriate means of consultation but must ensure that all individuals or organisations identified in regulation 11(5) and anyone else with a role in delivering the off-site emergency plan are made aware of the proposals and its contents. Iterative consultation may be appropriate in developing the plan and the local authority may consider using digital tools and open, collaborative approaches. For example, online information sharing platforms could be used to facilitate multi-organisation collaboration. Consultation should utilise a single forum or partnership set up to enable co-operation between the local authority and employers with duties under the off-site emergency plan (see paragraph 364). The local authority may also need to tailor the consultation to the needs and preferences of particular groups, such as the groups listed in paragraph 176. 285 Consultees should be given an appropriate amount of time to review and form meaningful views on the proposals. Consulting for too long will unnecessarily delay development of the plan but consulting too quickly will not give enough time for consideration and will reduce the quality of responses. The local authority will need to consider consultation time in its planning to comply with the timescales in these Regulations. 286 The local authority should consider the views provided and any evidence presented as part of the consultation process. 287 All organisations with a role in the off-site emergency plan should be consulted and should reach agreement on the role that they would perform in the event of a radiation emergency. 288 Consultation with the operator should ensure adequate dovetailing with the operator's emergency plan (see paragraphs 361 for further guidance on reviewing interfaces between the plans). 289 Consultation with Category 1 responders and appropriate Category 2 responders should ensure the plan enables a combined response from all responders, leading to integrated arrangements for emergency management. Discussions with the emergency services should include radiation protection arrangements for persons responding to a radiation emergency (see regulation 18 on emergency exposures). 290 Health authorities/boards are responsible for ensuring that satisfactory arrangements are in place for handling the health care aspects of the response to a radiation emergency. It is important for them to be aware of potential radiation

	emergencies so that they can dovetail their own emergency arrangements with those of the emergency services and the local authority. The health authorities may themselves also consult (or facilitate consultation with) the appropriate NHS trusts and/or hospital and emergency units. Hospitals, accident and emergency departments and other trusts responsible for managing primary and community care within the vicinity of the premises need, wherever possible, to be aware in advance of the possibility of dealing with and treating large numbers of people or casualties requiring special treatment. 291 The local authority must consult the relevant Agency, in particular regarding any protective measures for the environment (in so far as they relate to protection of exposure pathways for humans) and the arrangements for the transition to an existing exposure situation, for example how radioactive waste management arrangements and remedial measures for the environment would be established. The arrangements for the transition to an emergency exposure situation may have an impact on planning for the response phase of the emergency. 292 The local authority should consult PHE, Public Health Wales or Health Protection Scotland, as appropriate, on matters affecting the public health response. PHE's Centre for Radiation, Chemicals and Environmental Hazards provides radiation protection functions in Scotland, England and Wales and the local authority should consult it on public health matters relating to radiation protection. 293 Each of the statutory consultees should consider what assistance they might need from neighbouring authorities, for example local authorities, emergency services or health authorities/boards, especially in relation to outline planning which will cover a greater distance. The lead local authority can request the co-operation of another local authority in accordance with regulation 14 in order to make its off-site plan (further guidance is available under regulation 14). 294 It may also be necessary to consult with other individuals or organisations who may be involved with or affected by the implementation of the off-site emergency plan (e.g. regulators, certain government departments who provide national response capabilities, water authorities/suppliers, voluntary organisations, vulnerable groups and relevant local employers). 295 Local authorities should consult harbour authorities and airport operators, as appropriate, when preparing off-site emergency plans for berth or transit shed operators as there may be an overlap between the off-site emergency planning zones and the areas covered by emergency plans prepared by harbour authorities or airport operators.
Regulation 11(6)	*(6) The employer of any emergency worker who may be required to participate in the implementation of the off-site emergency plan must ensure that each such emergency worker is provided with—* *(a) suitable and sufficient information, instruction and training; and* *(b) any equipment necessary to restrict that employee's exposure to ionising radiation including, where appropriate, the issue of suitable dosemeters or other devices.*
Guidance 11(6)	296 The purpose of this regulation is a general requirement for information, instruction and training and equipment to restrict exposure and applies whether or not emergency exposures are required (see guidance on regulations 18(1)(b) and (c) regarding training and equipment for employees who may be subject to emergency exposures). 297 The information, instruction, training and equipment provided to emergency workers should allow them to perform their role in the off-site emergency plan

	effectively in the event of a radiation emergency, and enable their exposure to ionising radiation to be restricted, so far as is reasonably practicable. 298 The employer should ensure that information, instruction and training is kept up to date and reviewed regularly to ensure it remains current. It should also be repeated at an appropriate frequency to maintain competence levels. Training records should be kept to identify when refresher training is needed. The employer should have arrangements in place to ensure that all individuals new to the role are given suitable and sufficient information, instruction and training. If there are any changes to the emergency arrangements, for example the introduction of new equipment, emergency workers will require further information, instruction and/or training. 299 Information, instruction and training must should be effective and the employer should check its adequacy. This could include requesting feedback from emergency workers and reviewing capabilities, for example during the testing of emergency plans. The employer should ensure the training delivers its aims and objectives and, if it not, make changes to the programme. 300 Personal protective equipment may be necessary to restrict emergency workers' exposure to ionising radiation and they should also be issued with suitable dosemeters, where appropriate. Further guidance can be found under regulation 18(1)(e) in relation to dose assessments for employees who may receive emergency exposures. 301 The operator can provide suitable and sufficient advice and assistance to all employers regarding training and equipment, including advice on radiation protection.
Regulation 11(7-8)	*(7) The local authority must confirm in writing to the operator and to the regulator that it has prepared an off-site emergency plan as soon as reasonably practicable after the preparation of such a plan.* *(8) The local authority must provide a copy of the off-site emergency plan, or parts of it, to the regulator upon request and within such reasonable time as the regulator may specify.*

Regulation 12 Reviewing and testing of emergency plans

Regulation 12(1)	*(1) Each operator or local authority who has prepared an emergency plan pursuant to regulation 10 or 11, as the case may be, must, at suitable intervals not exceeding 3 years unless otherwise agreed by the regulator—* *(a) review and where necessary revise the plan for which they are responsible; and* *(b) test that plan, taking reasonable steps to arrange for all those with a role in the plan to participate in the test to the extent necessary to ensure that the plan is effective.*
ACOP 12(1)	**301 The result of a review of an emergency plan should be recorded, including actions to address any recommendations. All changes to the emergency plan should be managed through the use of an auditable system which tracks and logs the**

	changes from inception to completion of implementation. **303 In the case of new operators, the operator or local authority who has prepared an emergency plan should test that plan to ensure the plan is effective before the operator can require any person to carry out work with ionising radiation. Testing of outline planning in the off-site emergency plan should only be undertaken if required by regulation 12(2).**
Regulation 12(2-7)	*(2) The test required by paragraph (1)(b) need not extend to testing a local authority's emergency plan so far as it extends to the outline planning zone, unless—* *(a) a test is necessary in order to review or revise the plan, as required under paragraph (1)(a); or* *(b) the regulator requires a test.* *(3) The regulator may only agree that the review and test required under paragraph (1) may take place after the expiry of a three year period if—* *(a) the operator or local authority, as the case may be, has sent a written request for such an extension of time to the regulator; and* *(b) the written request is sufficient to demonstrate that the circumstances of the request are reasonable and exceptional.* *(4) A review required under paragraph (1) must take into account—* *(a) changes occurring in the work with ionising radiation to which the plan relates;* *(b) changes within the emergency services concerned;* *(c) new knowledge or guidance, whether technical or otherwise, concerning the response to radiation emergencies;* *(d) any material change to the assessment on which the plan was based since it was last reviewed or revised;* *(e) any relevant information derived from an assessment of or a report about the effectiveness of an emergency plan required by regulation 17(6); and* *(f) any relevant information derived from a report into the outcome of an earlier test as required by paragraph (8).* *(5) In determining how the off-site emergency plan is to be tested, the local authority must cooperate with—* *(a) the operator; and* *(b) any Category 1 responders in whose area the premises to which the emergency plan relates is situated.* *(6) A review or test of the plan required by this regulation must take into account any lessons learned from—* *(a) past emergency exposure situations, whether at the operator's premises or not; and* *(b) the United Kingdom's participation in emergency exercises at national and international level.* *(7) The test of the plan, required by paragraph (1)(b) must be adequate to test the ability to implement the plan in question, but the operator or the local authority, as the case may be, may for the purpose of determining the extent of that test, bear in mind—* *(a) the length of time since the last test of the plan;* *(b) the extent of the testing undertaken on the last occasion;* *(c) any activation of the plan as a response to a radiation emergency since the last test; and*

	(d) any revisions of the plan made by the review required under paragraph (1)(a).
ACOP 12(1, 2, 5, 6 & 7)	**304 An adequate test of an operator's emergency plan or detailed planning in an off-site emergency plan should demonstrate:** **(a) that the plan meets the principles and purposes of an emergency plan set out in Schedule 7;** **(b) that the plan meets the requirements of regulations 10 or 11 (as appropriate), and the appropriate sections of Schedule 6;** **(c) that the plan can be practicably implemented and will be effective in the response to a radiation emergency to secure, so far as reasonably practicable, the restriction of exposure to ionising radiation and the health and safety of workers and the general public;** **(d) the completeness, consistency and accuracy of the emergency plan and other documentation used by organisations responding to an emergency;** **(e) the adequacy of the equipment and facilities and their operability; and** **(f) the competence of responding personnel to carry out the duties identified for them in the emergency plan.** **305 An adequate test of outline planning in the off-site emergency plan should demonstrate:** **(a) that the plan meets the principles and purposes of an emergency plan set out in Schedule 7;** **(b) that the plan meets the requirements for outline planning in regulation 11 and the appropriate sections of Schedule 6;** **(c) that the plan provides a credible basis for a response to a radiation emergency in the outline planning zone by demonstrating that high level actions have been identified, including where capabilities could be obtained from and how (this may be through expansion of arrangements in the detailed emergency planning zone where one exists);** **(d) the completeness, consistency and accuracy of the emergency plan and other documentation used by organisations responding to an emergency; and** **(e) the competence of responding personnel to carry out the duties identified for them in the emergency plan.**
Guidance 12(1–7)	**Reviewing and Revision** 306 Review and, where necessary, revision of emergency plans must be undertaken at least once every three years, except where the regulator agrees to an extension in exceptional circumstances (see paragraph 314). 307 There are considerable benefits to be gained from issuing the operator's emergency plan and the off-site emergency plan at the same time so that the review and revision of the plans are aligned. 308 Review and revision in accordance with this regulation are different from updating emergency plans. Updating plans is an on-going process which is carried out to reflect any changes in the practical details of the emergency response arrangements, for example changes in the responding organisations' telephone numbers, personnel names or the mitigation equipment to be mobilised. 309 Reviewing is a fundamental process, examining the adequacy and effectiveness of the components of the emergency plan and how they function together. Reviewing the plan should ensure that the requirements of regulation 10 or 11 (as appropriate) and the

appropriate parts of Schedule 6 are still met and that the plan still aligns with the principles and purposes in Schedule 7. The review process should take into account:

(a) any changes identified in the review of the hazard evaluation and consequence assessment (regulation 6) and any changes to the consequences report (regulation 7);
(b) any changes to the boundary of the detailed emergency planning zone or outline planning zone;
(c) any changes within the detailed emergency planning zone our outline planning zone, for example a new school or hospital;
(d) any changes in the responding organisations relevant to the operation of emergency plans;
(e) advances in technical knowledge, for example new, more effective means of mitigation;
(f) new accepted international and national good practice including standards and guidance concerning the response to emergencies;
(g) significant changes in staffing resources including contractors;
(h) knowledge gained as a result of real emergencies occurring, either on-site (see regulation 17(6)) or elsewhere, including international emergencies;
(i) lessons learned during the testing of emergency plans at both national and international level; and
(j) any other changes which could affect the effectiveness of the plan.

310 One of the principal contributions to the process of reviewing and revising emergency plans will come from the results of tests of the emergency plans (see paragraphs xxx for further guidance). A report on the outcome of the test is required by regulation 12(8) (see paragraph xxx for further guidance and ACOP paragraph xxx).

311 Persons or employers, who have a responsibility under the plan should be provided with the opportunity to contribute to the review and where necessary take part in the revision of the plan.

312 For this to take place effectively there has to be communication between the operator, local authority and responding organisations. Collaborative working is often successful through the use of a single forum or partnership (see paragraph 387). There is a requirement to consult on the review with statutory consultees and others as appropriate (see regulations 10(5) and 11(5)). Changes which improve the operational effectiveness of the emergency plan should be incorporated as soon as reasonably practicable and consulted on with statutory consultees and other identified individuals and organisations. Any changes to the roles in the plan should be agreed with those affected. The revised plan should then be reissued to all plan holders and updates which affect the emergency response should be communicated appropriately.

313 If any significant changes are being made (such as significant changes in radionuclides used, plant modifications, or organisational structure) a review of the adequacy and accuracy of the emergency planning arrangements should be done at the same time. Under these circumstances, operators and local authorities should not wait until the three-year review is due to review their emergency plans (see regulation 10(9) which requires the operator to review and where necessary update the plan as a consequence of a review of the hazard evaluation and consequence assessment to take account of material changes in the operator's work with ionising radiation).

314 If exceptional circumstances prevent the review of an emergency plan being completed within a three year period, the operator or the local authority as the case may be, may ask the regulator for an extension in writing. The request should explain what the exceptional circumstances are and the regulator may agree to a longer period of time if it is satisfied that the circumstances of the request are exceptional, and that an extension would be proportionate and would not adversely affect safety. The regulator

should notify any such extension in writing. For example, if a significant material change is continuing at end of the three year review period which will require a review of the emergency plan, this may be considered exceptional circumstances. In such circumstances, the regulator may agree to an extension where it is proportionate to do so and providing the review is expected to take place within a reasonable time, usually within 6 months of the date it was due. Exceptional circumstances may also include circumstances where resource is diverted to respond to a real emergency (radiological or otherwise) but do not usually include extending the three year period to meet operational and business needs.

Testing emergency plans

315 The purpose of testing emergency plans is to demonstrate their ability to deliver an effective response to a radiation emergency which achieves the purposes set out in Schedule 7. It should give confidence in the accuracy, completeness, practicability and adequacy of the plans and should identify how plans can be improved.

316 There are considerable benefits to be gained from testing the operator's and local authority's off-site emergency plans (or parts of plans) at the same time. These benefits include ensuring that both emergency plans are compatible with one another and potential financial savings by avoiding duplicate testing.

317 Communication plans to deal with radiation emergencies based on perceived risk should be tested to examine the adequacy of the communication arrangements between all the key players. See paragraph xxx for further guidance on testing communications.

318 For those operators working in the nuclear industry; tests undertaken in accordance with nuclear site licence conditions should usually satisfy the equivalent requirements of REPPIR.

319 Operators of premises with a number of radiation sources in different installations with the potential to cause a radiation emergency should consider testing the emergency arrangements for each such installation at least once during the three-year testing period. On some premises there will be scope for economies of scale, using lessons learned from live tests on some installations, supported by appropriate table-top tests for other installations. This will depend upon similarities in the hazards and risks posed, and on the type of emergency response. It is important that the lessons identified from such tests are reported to the relevant managers, supervisors and employees on the premises. Conclusions about the installations under examination should be drawn from the findings of the test.

320 Berth or transit shed operators may decide to test aspects of their emergency plans at the same time as local authorities test the off-site emergency plans, or harbour authorities or airport operators test their own emergency arrangements under other legislation (e.g. DGHAR). There would be benefits to all parties in this, as the way in which the various plans dovetail could be assessed.

321 Dealing with the on-site consequences of radiation emergencies may require the assistance of the emergency services and, therefore, it may be appropriate for them to attend many of the operator's tests, but not necessarily all.

322 Testing of off-site emergency plans could include a range of activities such as communication exercises to examine the adequacy of the communication arrangements between all the key responders during a radiation emergency and table-top exercises to examine command and control arrangements and inter-agency liaison during an emergency. There will be considerable benefit in carrying out some of these activities more frequently.

323 In some local authority areas, there may be scope for economies of scale within the testing regime. It may be possible for one active participation test or table-top test to test the off-site emergency plan(s) for two or more premises (e.g. adjacent premises or those within the same local resilience forum where the responders are the same). This will depend upon the similarities of their location and of the hazards and risks posed to the nearby population. However, the test should use scenarios appropriate for each premises that fully test the plan in respect of each site. Where the operator's test their plans at the same time, each operator would have to test the site-specific features of their own premises in some other way, for example as part of the operator's emergency plan test or a communications test.

324 Local authorities may decide to test their off-site emergency arrangements for facilities under other regulations at the same time as their off-site emergency plans under REPPIR. There would be benefits to all parties in this, as the way in which the various plans dovetail could be assessed.

Adequate testing of the operator's emergency plan and detailed planning in the off-site emergency plan

325 Where the guidance below refers to detailed emergency planning zones, it also applies to any pockets of detailed planning within the outline planning zone.

326 Plans for the detailed emergency planning zone should be tested through practical rehearsal of strategic, tactical and operational decision making and implementation. See ACOP paragraph 304 on adequate testing.

327 To demonstrate that the full plan can be brought into effect all significant components of the emergency plan should be tested for the detailed emergency planning zone as part of a test regime within the three year test period. A test regime can be a single test or a combination of multiple tests that covers all components. Further guidance on the key elements of plans to be tested is available in NNEPRG and could include for example:

(a) notification to responders (declaration and alerting);
(b) facilities and equipment;
(c) strategic coordination;
(d) tactical coordination;
(e) operational coordination;
(f) warning & informing of the public affected;
(g) media strategy and coordination and communication;
(h) technical advice;
(i) protective action advice and consideration of vulnerable groups;
(j) communications between responders, including where appropriate mutual aid arrangements and national assistance;
(k) information sharing systems and situational awareness;
(l) radiation monitoring and decontamination; and
(m) transition from response to the recovery phase.

328 In relation to point (m) above the transition to recovery requires early consideration of recovery needs to help inform the decisions made during the response phase and potentially avoid compromising medium to long term recovery.

329 In testing the transition to recovery, considerations should begin at the earliest opportunity following the onset of an emergency, running in tandem with the response phase to the emergency.

330 A test programme may be used to allow all components of the plan to be tested over

a number of tests and within the three year test period. Operators or local authorities that wish to undertake such a programme should demonstrate how it will test all significant components of the plan. This should be done by producing a clear exercise programme and seeking agreement from the regulator before commencing the test programme.

331 Significant components of a plan made under REPPIR may be the same for other non-REPPIR plans; a test programme may use tests of non-REPPIR plans as evidence of testing components of the REPPIR plan with agreement from the regulator.

332 Where such a test programme is undertaken, it is good practice to carry out a single test of the entire plan at least once every six years to ensure that the components of the plan can be delivered concurrently and cohesively. This does not mean all components need to be live tested, for example where it could be detrimental to health and safety, but they should be tested in some form. There may be exceptions to this, for example, if full-scale testing under COMAH has recently taken place that tested the majority of the same elements as a REPPIR test.

333 Where there has been successful testing of particular components of the plan over a series of previous tests, and there is high confidence in the plan and the staff capability to deliver those components, it may be proportionate to carry out a table top exercise for those components.

334 Where it is appropriate to do so and with the agreement of the regulator, the extent of testing required may take into account the response to a real radiation or non-radiation (e.g. evacuation for flooding) emergency that has confirmed the adequacy of certain elements of the plan. The use of the plan in response to a radiation emergency may also identify areas which require further rehearsing and testing.

335 The scenario for the test should vary in each three-year testing period in order to test over time the range of emergency responses required for the range of radiation emergencies which might arise. The use of different initiating events, releases and weather conditions will vary the scenario and the conditions for the response and help to avoid test participants becoming overfamiliar with specific scenarios. In planning the test scenario, consideration should be given to the variable factors in paragraph xxx. There is considerable benefit to be gained from making the test more challenging and stress testing the plan. Additional challenges such as coincident incidents, extreme weather or loss of essential services or equipment etc. will help identify further lessons and subsequent improvements to the plans and arrangements.

336 An active participation test is the most effective means to demonstrate an adequate test of the emergency plan. This may involve the deployment of on the ground resources in a simulation of their actual response to an emergency. Practical capabilities which could be tested in this way may include, for example and where applicable:

(a) emergency services interface on-site;
(b) contamination control;
(c) breathing apparatus, and other emergency equipment, use and control;
(d) rest centres, for example setting up a rest centre using volunteers;
(e) contaminated casualty handling, including radiological protection of response staff; and
(f) the setting up and use of radiation monitoring units (RMUs) and other monitoring equipment, for example physical movement of RMUs to a location and simulation of the use of RMUs using volunteers.

337 Active participation tests need to be very carefully planned and risk assessed, paying particular attention to the safety of personnel. These can be resource intensive, so it is important that when they are carried out the maximum benefit is gained from

them and value for money is achieved.

338 Media arrangements should be tested with the involvement of all appropriate responding organisations. A wide range of media outlets are available for informing the public and testing should be able to demonstrate the use of those included in the emergency plan. The use of digital platforms should be considered, for example to test management of social media communications during the response to a radiation emergency.

339 Simulators may be available to simulate accidents which enable emergency responders to develop their skills and responses. These systems should be able to simulate a real emergency as realistically as possible. Under some circumstances, such systems may be useful when carrying out table-top and communication tests.

340 If exceptional circumstances prevent the test of an emergency plan being completed within a three year period, the operator or the local authority as the case may be, may ask the regulator for an extension in writing. The request should explain what the exceptional circumstances are and the regulator may agree to a longer period of time if it is satisfied that the circumstances of the request are exceptional and that an extension would be proportionate and would not impact on safety. The regulator should notify any such extension in writing. For example, if a significant material change is on-going at end of the three year test period which will require a review and test of the emergency plan this may be considered exceptional circumstances. In such circumstances, the regulator may agree to an extension where it is proportionate to do so and providing the test is expected to take place within a reasonable time, usually within 6 months of the date it was due. Exceptional circumstances may also include those where resource is diverted to respond to a real emergency, radiological or otherwise, or where a number of participating organisations are unable to resource a test due to some unplanned event impacting those organisations. Exceptional circumstances should not include extending the three year period to meet operational and business needs.

Adequate testing of outline planning in the off-site emergency plan

341 The local authority's off-site emergency plan relating to outline planning need not be tested unless requested by the regulator or where the local authority considers it necessary, including where it is necessary to effectively review the plan. For example, where significant changes are made to the plan which affect outline planning a test of the outline planning arrangements should be undertaken to ensure the revised arrangements are adequate. Other situations may include, for example, where there are significant changes to the demographics and/or significant building or road construction in the outline planning zone. Consideration should also be given to the length of time since the last outline planning test and the extent of testing undertaken on that occasion. This will guide the decision as to whether a test of the outline planning may be required to effectively review and revise the plan.

342 The regulator can request a test in writing to the local authority specifying in advance which parts of the emergency plan for the outline planning zone are to be tested and when it should be completed by.

343 Tests of the plan for the outline planning zone do not need to be as extensive as tests for the detailed emergency planning zone or on-site emergency plans. Planning for outline planning zones may be tested through desktop and modular exercises. See ACOP paragraph 305 on adequate testing.

344 The elements which might need to be tested in the outline planning zone do not differ from those in the detailed emergency planning zone. Some elements, such as urgent protective action, will be particularly relevant but should be tested in a

	proportionate manner. Where the local authority chooses to undertake an outline planning test, decisions would need to be taken by the local authority on what elements or aspects of outline planning should be tested and how this should be done. **Co-operation and Participation** 345 As r**e**quired by regulation 12(5) the local authority, operator and Category 1 responders must co-operate on how the off-site emergency plan is to be tested. This should include agreement on the overall objectives of the testing (which should be consistent with the purposes of emergency plans set out in Schedule 7 and other relevant regulations, ACOP and guidance) and the best way of meeting those objectives. A suitable scenario or scenarios will have to be developed from information in the consequences report (see regulation 7) together with any additional information provided by the operator, and the type and nature of the test will need to be agreed. It will be necessary to identify which organisations are to participate in the test and for each of these organisations to determine their own objectives, which should be consistent with the overall objectives of the test. 346 Clarifying objectives is assisted by the agreement by all participants of what is to be tested and what resources are required to demonstrate the adequacy of the plan. 347 If the local authority wishes to test other off-site emergency plans in conjunction with the REPPIR off-site plan, the local authority will have to endeavour to reach agreement with the various parties on how the test should be carried out. 348 Under regulation 12(1)(b) the local authority or operator must take reasonable steps to arrange for all those with a role in the relevant emergency plan to participate in a test to the extent necessary to test its effectiveness. Involving the relevant parties from the planning stage of the test should assist in securing their participation. An employer of any person whose participation is reasonably required by any emergency plan must co-operate with the operator or local authority to the extent necessary for compliance with REPPR requirements, including testing of the plan (for further guidance see guidance to regulation 15).
Regulation 12(8-10)	*(8) After completion of the test required by paragraph (1)(b), each operator or local authority, as the case may be, must prepare a report on the outcome of the test within 3 months of the conclusion of the test.* *(9) A report made under paragraph (8) must be sent to the regulator within 28 days of its completion.* *(10) Where a report made under paragraph (8) was made by the operator, the operator must send it to the local authority within 28 days of its preparation, and where such a report was made by the local authority, the local authority must send it to the operator within 28 days of its completion.*
ACOP 12(8)	**349 The report on the outcome of the test should:** **(a) contain an overview of the exercise;** **(b) highlight the strengths and weaknesses of the emergency plan as shown by the exercise, focussing on areas where the plan was insufficient, or could not be implemented;** **(c) highlight areas where the operator's emergency plan and the off-site emergency plan were not aligned (where both plans are tested together);** **(d) include any lessons identified and recommendations to resolve these, including any required changes to the plan; and** **(e) include any actions associated with part (d) with an assigned action owner and agreed time to complete the action and implement any change.**

Guidance 12(8-10)	**Evaluation of testing** 350 The regulator may assess the test(s) and make a judgement as to whether the test of the plan was adequate. The regulator will consider the relevant requirements of these Regulations and the points set out in ACOP and guidance. 351 A debriefing following an emergency plan test should be carried out in an open and blame-free atmosphere. This should allow any issues on implementing the emergency plan to be identified, the reasons for the problems to be discussed and appropriate solutions to be considered, so appropriate improvements can be made. 352 To obtain the maximum benefit from testing emergency plans it is important to evaluate the lessons learned from the tests, to determine where revision is required to the emergency plans, and to implement the changes. The operator or local authority who owns the emergency plan that has been tested is responsible for undertaking a lessons learned review following the test. All those that participated in the test should be involved in considering what the impacts or implications of the test performance and plan would be in a real radiation emergency and identifying the areas where the objectives were not met together with any other areas for improvement. This should include any observations from the regulator. Organisations may set their own objectives such as quantitative measures for timeliness of response, or qualitative measures for effective performance. However, there should be consistency of approach for evaluating the effectiveness of the overall test and the interfaces between responding organisations. 353 During a lessons learned review it is important to identify the root cause of each shortfall together with a recommendation that includes rectifying action to be taken, an action owner or owners and a timescale for implementation, using the auditable management system referred to in paragraph 352. Existing governance arrangements which include local resilience forums or other emergency planning groups should be used to oversee the progress of any actions relating to local issues. Where changes are required to the plan, the plan should be updated as soon as reasonably practicable. 354 Any lessons identified during a review or test should be shared with the appropriate organisations to promote relevant good practice, for example to other operators, local authorities, relevant organisations and to relevant government departments (regulations 12(9) and 12(10) require a report on the outcome of a test to be sent to the regulator and operator or local authority as appropriate). This can be done by sharing the lessons identified with regional or national forums for their consideration to develop and apply learning and address cross-cutting issues, where appropriate. **Report on the outcome of the test** 355 The report of the test required by regulation 12(8) relates to the three yearly test required by regulation 12(1)(b), covering all significant components of the plan. If the exercise was undertaken as a series of component tests, a report should be produced following each test so that any lessons can be identified as soon as reasonably practicable but this does not need to be submitted to the regulator under regulation 12(9). A report covering the whole test programme should be produced on the outcomes of the test programme as a whole and submitted to the regulator. It may be appropriate to tabulate each of the component tests in the report, including details of when and how each component was tested. 356 ACOP paragraph 349 sets out what should be included in the report as a minimum.

	357 Important points raised by participants should be included and participants should also have the opportunity to comment on the report and agree to any recommendations prior to the report being finalised. 358 Regulation 12(4)(f) requires the outcomes of the report to be considered in a review of the plan. Any actions raised in the report should be tracked, using the auditable system referred to in ACOP paragraph xxx, to close out the actions and identify any changes to the plan and the rationale for such changes. 359 The operator or local authority may choose to share the report with other organisations involved in the test or with a role in the plan in order to share learning.

Regulation 13	**Cooperation: operator and local authority**
Guidance 13	360 Regulation 13 requires the cooperation between the operator and the local authority in fulfilling their duties to prepare emergency plans. There is guidance to assist in ensuring that the off-site plan and the operators plan dovetail with one another (but can also work independently). The ACOP and guidance also describes the arrangements that should be agreed, recorded and put in place between the local authority and the operator to ensure that there is communication from the start of and throughout the emergency.
Regulation 13(1)(a)(b)(c) and (2)	*(1) The operator and the local authority must co-operate in respect of their duties to prepare emergency plans to ensure that—* *(a) the operator's emergency plan and the local authority's off-site emergency plan operate effectively both independently and in conjunction;* *(b) communication between the operator and the local authority is expedited during any radiation emergency; and* *(c) communication between the operator and the local authority and any organisation which is responding to the radiation emergency is expedited.* *(d) The local authority must, in particular, inform the operator which responder or responders should be contacted in order to provide early warning of a radiation emergency as required by paragraph 1(f) of Schedule 6.*
Guidance 13(a)	361 The operator should review the sections of the off-site emergency plan and the local authority should review the sections of the operator's plan where the two plans interface, both during the preparation stage and at each revision as part of the consultations required by regulations 10(5) and 11(5). Where any potential incompatibility is found, the local authority and the operator should work together to align the plans. Care should be taken to identify which areas of both plans have any bearing on the other's plan and these areas should be noted and made known to the other party. 362 Cooperation may be required for, amongst other areas, planning: (a) protective action that will be carried out on the premises either by the operator or the emergency services; (b) the allocation of resources, for example to ensure that there is sufficient resource where specialist emergency responders, equipment or assets are required by both the off-site and the operator's emergency plans; (c) how the emergency services will access the premises in the event of an

	emergency; (d) the use of emergency warning systems on premises such as alarms or lights; (e) evacuation protocols, routes and mustering locations that are situated outside of the premises; (f) the prior information to be sent to the public (required under regulation 21) and the information to be provided to the public in an emergency (required under regulation 22); and/or (g) how the public will be alerted in the event of an emergency, for example, by automated telephone systems or by klaxon. 363 The operator's plan and the off-site plans should also work independently of one another. The on-site plan should be effective in the case that the off-site plan does not need to be triggered as is the case when the emergency can be contained and managed by the operator within the site boundary (although the off-site emergency organisations should be notified in this instance, and usually some stand-by action would be taken as indicated in the off-site plan). The off-site plan (or parts of it) should be able to be triggered independently of the operator's plan for example to enable communication arrangements to be activated as a result of a non-routine situation or event on site which could result in a perceived risk by the local population.
ACOP 13(b)	**364 Communication methods should be agreed between the operator and the local authority and any other responding organisation and recorded in the operator's and/or the off-site plan(s) as appropriate.**
Guidance 13(b) and (c)	365 The operator's and/or off-site plans should detail how, in the event of a radiation emergency being declared, the operator notifies the appropriate responding organisations with the details as specified in Schedule 6 Part 2c. 366 Communication may take place via telephone, fax, email, in person (for example if the operator sends representatives to any multiagency coordination centres), using a shared online platform and/or by any other methods that enable a reliable, timely and effective response, and with appropriate security measures taken into account. Communication systems should be effective under hazard conditions. 367 The initial notification including information about the incident is usually given to the emergency services (via the 24-hour operational control room). That information is then cascaded to other response organisations (including the local authority), so far as the arrangements are described within the off-site and/or the operator's emergency plans. 368 The information that the emergency services and other relevant responding organisations will need from the operator during the emergency, as described in paragraph xxx, should be agreed and recorded in either the off-site emergency plan and/or the operator's emergency plan. Information should be provided using METHANE, which is the Joint Emergency Services Interoperability Principles (JESIP) recognised common model for passing incident information between services and their control rooms. Information should be updated and expanded upon using the METHANE standardised model as the emergency develops. Arrangements should also specify the mechanism by which the local authority or other organisations with a role in the off-site emergency plan can request further information from the operator during the emergency and how this will be provided as soon as reasonably practicable after it becomes available. The operator should consider within their plans how any uncertainty associated with any predictions or estimates will be conveyed to the off-site response organisations.

Regulation 14 Cooperation between local authorities

Guidance 14	369 This regulation requires cooperation where a lead local authority requires assistance from another local authority to make and test its off-site emergency plan if, for example, protective action is required for persons situated in the jurisdiction of that other local authority. The guidance describes how the request should be made and how cooperation should be provided.
Regulation 14(1-2)	*(1) A local authority may request, in writing, the cooperation of another local authority in order to—* *(a) make or review its off-site emergency plan; and* *(b) test its off-site emergency plan as required under regulation 12(1)(b).* *(2) Where a local authority has made a written request of another local authority under paragraph (1), the local authority which has received such a request must, as soon as reasonably practicable, cooperate in assisting the requesting local authority in both making and testing the off-site emergency plan.*
ACOP 14(1-2)	**370 Where the co-operation of another local authority is requested, the lead local authority should provide the cooperating local authority with a pre-planned schedule of activities. This schedule should describe the activities that the cooperating local authority is required to complete to assist in the drafting, review and / or testing of the off-site emergency plan, along with associated timescales for completion.** **371 Where the assistance of another local authority is required, a clear description of the role of that cooperating authority together with its responsibilities should be included within the lead local authority's off-site emergency plan.**
Guidance 14(1-2)	372 The lead local authority, may require another local authority to assist in the drafting, reviewing and testing of its off-site plan. A request may be required if, for example, a section of the detailed emergency planning zone or the outline planning zone falls within the jurisdiction of the other local authority, or if resource is required from the other local authority (eg if rest centres are located within, and managed by that other local authority). 373 The lead local authority should draw up a schedule of activities for drafting, reviewing, revising and testing the off-site emergency plan and this should be shared with any other relevant local authorities via existing local forums or partnerships. Working to a schedule of activities is reasonable to expect, it reduces the burden of ad-hoc requests and should enable the other local authority/authorities to provide an adequate contribution to the regulatory tasks. 374 Assistance may take the form of attending planning meetings, providing information for the off-site plan, providing and maintaining capabilities or facilities, reviewing the off-site plan and/or assisting in the organisation of, or participation in tests or any other relevant activity specified by the lead local authority. 375 Where the other local authority is not able to fulfil the request in full, they should inform the lead local authority without delay. The two local authorities should then work together to find a solution that is suitable to both parties. 376 The lead local authority should consult any relevant local authorities on the off-site plan, or changes to that plan with respect to the role and responsibilities of that local authority (as required by regulation 11(5)). Similarly, the lead local authority should consult any other relevant local authority in the preparation of information that

	will or might be provided to persons within the jurisdiction of that other local authority (as required by regulations 21(4) and 22(3)). 377 The lead local authority should make available a copy of the off-site emergency plan to any local authority that has duties under the plan, or who has co-operated in its' preparation or review. 378 Where other tiers of local government are required to assist the lead authority (other than those within the definition of local authority such as borough or district councils that are not unitary authorities), these may be required to do so under regulation 15(3). In this case similar arrangements can be made to those described above.

Regulation 15 Consultation and cooperation: employers

Guidance 15	379 Regulation 15 requires operators and employers on their premises that work with radioactive material to work together to ensure that the operator can fulfil its duties under the Regulations. Similarly, the regulation requires local authorities and employers with duties under the off-site plan to work together to establish and maintain a suitable and sufficient plan. To do this the regulation puts duties on all organisations. The ACOP describes how regulation 15 should be met and the guidance provides further considerations.
Regulation 15(1-2)	*(1) In performing the duties imposed on an operator under regulations 4(1), 5(1), 6(1) and (2), 7(1) and 10, that operator must consult any other employer who carries out work with ionising radiation on the premises and 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 must cooperate with the operator of those premises or the local authority in whose area the premises is situated by providing information or otherwise to the extent necessary to ensure that the operator or local authority, as the case may be, is able to comply with the operator and the local authority's duty to prepare an emergency plan.* *(3) Any employer of any other person whose participation is reasonably required by any emergency plan required under these Regulations must cooperate with the operator or the local authority, as the case may be, in the exchange of information or otherwise to the extent necessary to ensure that the operator or the local authority is enabled to comply with the requirements of these Regulations, insofar as the operator or the local authority's ability to comply depends on such cooperation.* *(4) The cooperation required by an employer under paragraphs (2) and (3) extends to cooperation in the testing of emergency plans where such cooperation is necessary to secure compliance with regulation 12.*
ACoP 15 15(1-2)	**Duties on Operators** **380 In relation to regulations 4(1), 5(1), 6(1), 6(2), 7(1) and 10, the operator should:** (a) **request the details of relevant employers' work involving radioactive material in advance of drafting the hazard evaluation, and at each review of that evaluation.** (b) **consult any employers on the premises that have a role in the operator's emergency plan on that role when drafting the plan, or on any changes to that role on revision.**

	(c) **consider how relevant information obtained from the consultation with employees informs the hazard evaluation, the consequence assessment, reviews of either the evaluation or the assessment, or the operator's emergency plan.** **Duties on Employers on Premises** **381 Employers should:** **(a) upon request, provide the operator with a description of their work with ionising radiation that involves radioactive material on the premises, advise the operator of any material change to their work with radioactive material on the premises, wherever practicable prior to that change.** **(b) put into place any reasonable measures that enable them to carry out their role in the operator's emergency plan within an agreed timeframe.** **Duties on Employers** **382 Employers of any other person whose participation is reasonably required by an emergency plan should:** **(a) Upon request, provide to the local authority or to the operator, details of procedures, employees, training, equipment or any other relevant information that is required to enable the local authority or the operator to perform their duties under these Regulations; and** **(b) Put into place any reasonable measures that enable them to carry out their role in either emergency plan within an agreed timeframe.**
Guidance 15(1-3)	**Employers and Operators** 383 There may be a number of employers working with ionising radiation on a single premises (see guidance paragraphs 36-45 on the definition of 'premises' in regulation 2(1)). In such a case, if and where the total quantities of radioactive substances on the premises exceed the REPPIR thresholds (listed in Schedule 1), the operator of that premises must undertake a hazard evaluation (see regulation 4) and if required, a consequence assessment (see regulation 5) and prepare an emergency plan (see regulation 10) that takes account of all the radioactive substances on those premises, regardless of whether they are held or used by one or more employer(s). In addition to the details of work with ionising radiation required by the ACOP above, the operator may also wish to request a copy of the employer's risk assessment, or consult on the draft or updates to the hazard evaluation, the consequence assessment or the operator's emergency plan. Consultation on the operator's plan is required if the employer has a role specified within it. In this case, the employer is required to assist in the tests of the operator's plan in addition to carrying out relevant training, obtaining and maintaining facilities or equipment, or taking any other measures that would ensure they could carry out their role. **Employers and Local Authorities** 384 Some employers on premises are required to work with the Local Authority in the production, review and testing of their emergency plan in the case that the local authority requests assistance. For example, an on-site (private) emergency service employer may be required to work closely with attending emergency services in which case their discrete roles together with their interactions should be recorded in the off-site and/or operator's emergency plans. Employers on premises, the operator and the local authority must all work together when reviewing and testing the consequence assessment and emergency plans. 385 Regulation 11(3) requires that all employers of persons whose participation is reasonably required within an emergency plan must cooperate with the local authority or

operator, as appropriate, throughout the process of preparation, review and testing of that plan. Assistance may take the form of attending planning meetings, providing information for an emergency plan, providing or maintaining capabilities or facilities, reviewing emergency plans and/or assisting in the organisation of, or participation in tests or any other relevant activity specified by the operator or the local authority.

386 Employers include category 1 and 2 responders, local authorities (including neighbouring authorities and those within other tiers of local government), voluntary organisations, the military, businesses and other organisations within the planning zones as required.

387 Cooperation should make use of existing structures such as forums or partnerships which allow good working relationships to develop, which would be important during an emergency. Relevant information should be shared freely and frequently between those involved in the forum/partnership both at and between meetings. The process of establishing relationships within a forum or partnership will enable the development of shared objectives, which facilitate the production or review of plans, and readiness, due to a shared understanding of emergency arrangements. Cooperation between organisations enables, for example:

(a) the co-ordination of training to ensure there are sufficient staff across all the relevant organisations who are capable of enacting the emergency plans;

(b) the management of a common information sharing platform for use during an emergency;

(c) the management of facilities that are suitable for all relevant organisations (for example at co-ordination centres);

(d) the identification of best practices and areas for improvement following tests of the plans to enable continuous improvement,

(e) the arrangements for communication with all stakeholders and the public across the full range of media in the event of an emergency, and

(f) the use of commonly agreed terminology and definitions.

Where an employer is not able to fulfil a request made by the operator or the local authority, they should inform the relevant party without delay and work together to find a solution that is suitable for both parties.

Operators

388 The operator should share any relevant information (in consultation with a RPA) with the emergency services to enable them to estimate potential emergency exposures for their employees. The operator will also be required to provide any other information to the local authority for the off-site emergency plan that enables the emergency services to respond on-site (in accordance with regulations 10 (6) and 10(7)), such as the location of on-site water sources, hazards and emergency routes.

389 If there is more than one berth or transit shed handling REPPIR quantities of radionuclides at the same port or airport, the operators must cooperate with each other. DGHAR requires harbour authorities to consult berth operators when preparing their emergency plans. Such cooperation is particularly important in view of the potential risks from radioactive substances being moved or stored within the port which may have implications for adjacent employers handling quantities of radioactive substances below REPPIR thresholds.

Regulation 16 Charge for preparation, review and testing of emergency plans

Regulation 16(1-6)	*(1) A local authority may charge the operator a fee for the performance of the local authority's functions in relation to the off-site emergency plan relating to the operator's premises under regulations 8, 11, 12 and 21.* *(2) The fee charged under paragraph (1) must not exceed the sum of the costs reasonably incurred by the local authority in performing its functions referred to in that paragraph including any costs reasonably incurred in arranging for any participants to take part in the testing of the off-site emergency plan.* *(3) When charging the operator a fee in accordance with paragraph (1), the local authority must provide the operator with a detailed statement of the costs incurred, and the period to which the statement relates.* *(4) The local authority's fee under this regulation is payable one month after the statement required under paragraph (3) has been provided, unless, within that period, the operator informs the local authority in writing that it considers that its costs are unreasonable and requests additional information from the local authority concerning its costs.* *(5) Additional information requested under paragraph (4) must be provided by the local authority within 28 days from the day on which it received that request, and the period for payment of the fee provided under that paragraph is extended for a further period of two months from that date.* *(6) A fee charged under this regulation is recoverable as a civil debt.*
Guidance 16(1-6)	**Overarching principles** 390 The following principles, so far as reasonably practicable, should be followed for fees charged. Fees should be: (a) directly related to costs, and solely for, the purpose of fulfilling a duty under regulations 8, 11, 12 or 21 of these Regulations, (i) for those costs actually incurred, (ii) fair, proportionate and commensurate to the duty or risk, (iii) either for staff time or capital spend, and (iv) forecasted in advance as far as is reasonably practicable and agreed with the operator, with a mechanism to agree variations. (a) Local authorities should make use of existing forums wherever practicable to reduce the costs for duties that require input from other organisations. (b) A detailed breakdown of itemised costs incurred should be provided to the operator promptly following the completion of work. (c) Any unavoidable costs that are not known in advance of work commencing should be an exceptional circumstance and should meet the above principles in (a) to (c). **Cost Estimation and Charging Mechanism** 391 The activities for which charges are to be claimed should be agreed in writing between the lead local authority and the operator and a reasonably accurate estimate of those costs should be provided to the operator at an agreed period that is at least one month in advance of the activities commencing. 392 Charges should be based on the time spent by officers of the appropriate grades and any associated travel and capital costs. The staff time cost is calculated from the costs of staff salary and benefits plus a fair proportion of overheads based on the time spent. Capital costs may include for example website investment or leaflet production and distribution relating to the duty to provide prior information to the public.

393 In presenting a charge to the operator, the local authority should provide an itemised statement of work done and costs incurred.

394 All costs should be fair, reasonable and specific to the costs actually incurred.

395 The charging mechanism should be transparent but should not overburden local authority staff.

Setting the detailed emergency planning zone

396 The local authority can charge reasonable fees for determining and where appropriate, amending, the detailed emergency planning zone. Costs can be charged for the time spent in reviewing the operator's consequence report, identifying the zone boundaries and producing maps. Costs may also be charged for liaising with other organisations to identify issues or improvements.

397 The local authority should not charge for any technical or specialist advice on the distance that informs the detailed emergency planning zone as determined by the operator.

Local authority's off-site emergency plan

398 The local authority can charge reasonable fees for preparing, reviewing and revising the off-site emergency plan. Costs can also be charged for the local authority's duties to consult the statutory consultees on that plan (as required by regulation 11(5)).

399 Capital costs can be charged for essential items and services specifically required by the off-site plan, for example, if the pre-distribution of stable iodine is required.

400 Work and facilities required by local authorities for general emergency response functions such as joint operations centres or country road signs for example, cannot be charged for.

Test of the off-site emergency plan

401 The charges that local authorities make for testing their off-site emergency plan should only cover the reasonable costs of testing to make sure that the plan is effective at mitigating the consequences of a radiation emergency and can be implemented. If the test is made broader than this for other reasons, such as to provide training opportunities, then charges should not be extended to cover the additional costs. Costs can be claimed by the local authority for participants from other organisations with a defined role in the off-site emergency plan and deemed necessary to test the off-site emergency plan for their time in preparing for and participating in that test. This may include attending familiarisation activities that are specific to the test and/or post-test debriefs.

402 If only part of the off-site emergency plan is tested, reasonable fees can only be made for the activities and participants with a defined role in the off-site emergency plan that are necessary to test that part. If the test includes elements required by other regulations such as COMAH, or CCA, or it is undertaken for any other reason other than those necessary for REPPIR, fees cannot be charged for those elements under REPPIR.

403 Reasonable fees can be charged for the activities required to prepare for a test and for the production of the report on the outcome of the test as required under Regulation 12(8).

404 Fees cannot be charged for testing the recovery phase, although reasonable costs can be charged for testing the transition to the recovery phase (referred to an existing exposure condition in these Regulations).

405 Fees cannot usually be charged for the hiring, purchasing or maintaining of any facilities or equipment required during the test, unless it can be shown that the facility or equipment is required solely for testing the off-site emergency plan and the costs are pre-agreed with the operator as being necessary for the test.

406 If a test of the off-site emergency plan is deemed not to be sufficient, regardless of

reason or fault, reasonable costs can be made for a full or partial retest as required by the enforcing authority. These costs should be estimated in advance of a retest and agreed with the operator.

407 Fees cannot be charged for any activities that those required to participate in tests of the off-site emergency plan are required to do following a test to rectify or improve their capability to meet the standards required under these Regulations.

The provision of prior information to the public

408 The local authority can charge reasonable fees for preparing, reviewing, revising and distributing prior information that they are required to provide to those residing or working within the detailed emergency planning zone and the outline planning zone as required by regulation 21.

409 However, it cannot charge for activities that that are disproportionate such as a full multi-media campaign for outline planning zones. Fees must be commensurate to the risk, specific and directly related to the duties in REPPIR. Reasonable fees should therefore not subsidise or fund any activities that are not specific to REPPIR duties, such as wider communications approaches. This is in line with the principles set out on not cross-subsidising in HM Treasury publication 'Managing Public Money' - https://www.gov.uk/government/publications/managing-public-money. Where prior information forms part of an integrated communications approach, only reasonable costs for the part relating to REPPIR may be recovered.

Other Charges

410 In addition to the reasonable costs set out above, reasonable fees can be charged for:

(a) the time of staff from other organisations that assist the local authority in meeting the requirements referred to regulation 16(1),

(b) the time spent in preparing for, or responding to media coverage that is directly associated with the determination of the detailed emergency planning zone, the publication of the off-site emergency plan or with providing prior information to the public.

(c) considering and implementing material changes which may impact on the detailed emergency planning zone, outline planning zone or the off-site emergency plan. Any such costs must directly relate to the consideration of the impact of that material change on relevant REPPIR duties and activities undertaken to implement those changes. For example, costs may be recovered for considering revision to the detailed emergency planning zone or the outline planning zone and/or for updating the off-site emergency plan if planning permission was sought for a new hospital or large development within or adjacent to a REPPIR emergency planning zone.

(d) attendance at meetings where the main purpose is to assist in fulfilling the duties specified under 16(1). For example, the local authority may claim for attending a meeting that is directly related to reviewing or updating its off-site emergency plan, determining the detailed emergency planning zone or regarding the provision of prior information to the public.

(e) the time spent by the local authority in co-ordinating cost recovery.

411 The local authority may decide to contract out some of the work to another organisation, in which case the authority may recover the costs of the contract from the operator. In the case that work is contracted outside the local authority, the costs should be fair, reasonable, specific to the duty placed on the local authority under REPPIR, and wherever practical, agreed in advance.

412 Fees cannot usually be charged for the purchasing, hiring or maintenance of facilities and equipment (for example at co-ordination centres that have uses beyond

	REPPIR activities). Charging an apportioned cost may be appropriate if there are parts of facilities (such as stable iodine stores) that are for the sole purpose of enacting the off-site emergency plan. 413 Fees cannot usually be charged by the local authority for activities in support of co-ordinating or providing training, equipment, monitoring or medical surveillance for employees that could potentially receive emergency exposures whilst implementing emergency plans. There may be exceptions to this, for example in the case that monitoring equipment is required under the off-site emergency plan where national capability would not be available within appropriate time periods to monitor the public in the event of a radioactive release. In this case the cost for acquiring and maintaining this equipment could be claimed. However it is the expectation that the majority of training, equipment, monitoring or medical surveillance will be for the operator, or for category 1 responders and that each organisation will bear their own costs. 414 Where travel is required, reasonable costs for travel and accommodation can be charged. In this case general limits should be agreed between the operator and the local authority that relate to all travel costs in advance of commencing work. These limits should be in line with spending rules that are already in place either for the local authority or for the operator's staff. 415 The above guidance is not exhaustive; other reasonable costs may be charged provided so long as they meet the overarching principles. **Dispute** 416 The local authority and operator should make all reasonable endeavours to agree the reasonable costs to be covered between them, in line with the dialogue and joint working required by REPPIR. Should there be a dispute between the operator and the local authority about fees owed, an independent mediator could be used. Ultimately if no resolution can be found, the dispute may be taken to the civil courts for a resolution.

Regulation 17 Implementation of emergency plans

Regulation 17(1-3)	*(1) An operator who has prepared an emergency plan pursuant to regulation 10 must take reasonable steps to put it, or such parts of it as are necessary, into effect without delay—* *(a) when a radiation emergency occurs; or* *(b) if an event occurs which might lead to a radiation emergency.* *(2) When an operator takes the steps set out in paragraph (1), the operator must at the same time inform the local authority in whose area the premises is situated and the regulator that the operator has put its plan into effect.* *(3) A local authority which has prepared an off-site emergency plan pursuant to regulation 11 must take reasonable steps to put it, or such parts of it as are necessary, into effect without delay when informed by the operator that —* *(a) a radiation emergency has occurred; or* *(b) an event has occurred which could give rise to a radiation emergency.*
Guidance 17(1-3)	417 In the event of a radiation emergency or an event which might lead to a radiation emergency, delays in implementing emergency plans should be minimised. Discussions to ensure that delays are minimised should take place with all statutory consultees during the preparation of emergency plans.

418 Declarations can be defined and used to indicate whether an incident has occurred and what the potential consequences are. For example, within the nuclear industry these may include:

(a) Site incident - a hazardous condition, which is confined in its effect within the boundary of the site security fence.
(b) Off-site nuclear emergency - a hazardous condition which results, or is likely to result, in the need to implement protective action to protect the public beyond the site boundary from a radiological hazard.

419 An event could occur which is perceived as a radiation emergency off-site but will not result in irradiation or a release of radiation (eg. a conventional emergency involving emergency services response, a false alarm on a site perimeter monitoring system or a routine operation such as a steam release that could be observed locally). Such an event meets the definition of a radiation emergency and requires implementation of emergency plans. In these situations, communications elements of plans should be implemented in order to manage local concerns and queries.

420 In the event of abnormal conditions being suspected, operators should act to halt, contain and control any release of radiological material or halt, shield and control any irradiation. Site personnel should follow defined and rehearsed procedures to investigate, assess and, if required, declare a site incident or off site nuclear emergency or other such declaration as defined in emergency plans. The investigation and assessment that is undertaken at this stage is to enable a decision on the appropriate declaration state. The operator should aim to make a declaration within 15 minutes of symptoms being detected and assessed. Arrangements should be in place to ensure that the person making the declaration is aware of the indicators of a potential radiation emergency and the appropriate notification and protective action warranted to be taken immediately in an emergency. There should be a clear and logical decision-making system in place.

421 An emergency plan should be implemented in the event that the operator was operating outside its normal operating arrangements and an expected escalation or loss of control is anticipated or likely.

422 Emergency plans should explain roles and responsibilities (see Schedule 6).

423 If there is an alarm system as part of the arrangements, there needs to be agreement as to who will initiate any alarm and this should be documented in the emergency plan. It may be appropriate for an employee of the operator to be identified (by name or position) as having the responsibility for sounding any off-site alarm/siren. Alternatively, sounding an off-site alarm could be the responsibility of an external organisation.

424 The process for alerting off-site organisations will follow locally agreed arrangements. An established and robust cascade alerting system will then be instigated to inform both local and national levels. This should include arrangements for the operator to notify the local authority, emergency services, health authority/board, relevant Agency, regulator and other organisations as appropriate of a radiation emergency or an event which may escalate into a radiation emergency. These arrangements should be described in the emergency plans (see Schedule 6).

425 As soon as the operator (or a body acting on the operator's behalf, such as the police service) has informed the responding organisations that a radiation emergency or an event that is likely to lead to a radiation emergency has occurred, the off-site emergency plan must be implemented without delay in accordance with the agreed arrangements. The persons specified in the off-site emergency plan as being authorised to initiate the plan should take action without delay. Organisations should implement their own emergency arrangements when an appropriate notification is received.

	426 In an escalating situation, the operator's emergency plan would be implemented. If the situation does not develop or is contained, remaining an on-site incident only, the off-site emergency plan may not be implemented at all. In practice this would be rare as the on-site mitigatory assistance of external agencies is within the off-site plan. It could also be activated as a precautionary approach if it is possible that the incident could escalate. Elements of the off site plan, such as alerting of responders, information sharing and public communications, might be required to ensure that the full plan can be implemented quickly if the site situation deteriorates. The off site plan would be expected to be implemented for an off-site nuclear emergency. 427 The duty to implement the operator's and off-site emergency plans lies with the operator and the local authority respectively, although, by agreement (and in accordance with the procedure written into the appropriate emergency plan) someone acting on their behalf, for example the police or fire and rescue service, may initiate the emergency plan. The operator or local authority will have discharged this duty when there are systems in place to ensure there are no unreasonable delays between the discovery of a radiation emergency (or event which might lead to a radiation emergency) and activation of the operator's emergency plan or local authority's off-site emergency plan. 428 When the operator informs the regulator of an event occurring or potentially occurring which might lead to a radiation emergency in accordance with 17(2), the operator should supply the regulator with a representative range of source terms (see definition in Schedule 3(9)) and description of the event. The source terms provided should be relevant to the radiation emergency that has occurred or that might occur and should be provided as soon as reasonably practicable following the emergency plan being put into effect. During the initial stages of a response, this radiological data and description of events occurring will inform decisions on off-site protective action.
Regulation 17(4-5)	*(4) In the event of a radiation emergency occurring, or on the occurrence of an event which could give rise to a radiation emergency, the operator, with the local authority that has prepared an off-site emergency plan, must make a provisional assessment of the circumstances and consequences of such an emergency, and for this purpose must consult—* *(a) the emergency services;* *(b) the health authority in whose area the premises to which the emergency plan relates is situated;* *(c) the health bodies set out at regulation 10(5)(e) and (f) and 11(5)(f) and (g) respectively;* *(d) the Agency; and* *(e) any other persons, bodies or authorities which have functions under the operator's emergency plan, or the local authority's off-site emergency plan.*
Guidance 17(4)	429 When an emergency plan is implemented, the priority will be to ensure effective mitigation. 430 As soon as is reasonably practicable following the start of the radiation emergency, a provisional assessment must be made of the circumstances that led to the radiation emergency occurring, or the occurrence of an event which could give rise to a radiation emergency. The provisional assessment should provide an understanding of what is happening on the site to inform the protective action to be taken to protect people, control the event and mitigate the consequences. When the operator informs the local authority and the regulator of a radiation emergency or an event occurring which might lead to a radiation emergency as per 17(2), the operator should supply the regulator with a suitable

	and sufficient range of source terms (as per Schedule 3(2)). The source terms provided should be relevant to the radiation emergency that might occur or that has occurred and should be provided as soon as reasonably practicable following the emergency plan being put into effect. During the initial stages of a response, radiological data and events occurring will inform decisions on the protective action to be taken. 431 Records should be kept of radiological data, events, decisions taken and actions carried out, as appropriate. The records of radiological data etc. will inform the provisional assessment of the circumstances and consequences of such an emergency. This should also include an initial assessment (or estimation) of doses received by people, and the likely effect on the environment which may affect people, such as implications for foodstuffs and drinking water. Data necessary for the provisional assessment may include personal dosimetry, *in vivo* monitoring, workplace monitoring and environmental sampling. Information necessary for the provisional assessment may include an analysis of the structural integrity of the plant, and an evaluation of the success of the protective action taken. The circumstances that contributed to stopping any release should also be included as part of the provisional assessment. This will inform decisions on how to maintain the integrity of the source, and how to move forward into the recovery phase. Arrangements for assisting in the transition to recovery should be detailed in emergency plans as per Schedule 6 Part 1 (1)(n) and Schedule 6 Part 2 (2)(k).
Regulation 17(4-5)	*(5) The assessment required by paragraph (4) must take place as soon as reasonably practicable in order to respond effectively to the particular characteristics of the radiation emergency.* *(6) The operator must as soon as is reasonably practicable and in any event within 12 months, or such longer time as the regulator may agree, make a full assessment of the consequences of the radiation emergency or other event and the effectiveness of the emergency plans put into effect in accordance with paragraph (1).* *(7) The local authority must co-operate with the operator in making the operator's assessment of the effectiveness of the emergency plans as required by paragraph (6).* *(8) The operator must, within 28 days of the day on which the assessment made under paragraph (6) is completed, make a report of the findings of that assessment and retain that report or a copy of that report for at least 50 years from the date on which the report was completed.* *(9) The operator must provide the regulator with a copy of the report made under paragraph (8) within 28 days of the day on which it was completed.*
Guidance 17(5-9)	432 The operator with the help of the local authority must complete its full assessment as soon as practicable, and in any event within one year of the radiation emergency occurring. If a longer period of time is necessary to complete the assessment, this must be agreed with the regulator. Other statutory processes (e.g. public inquiries, investigations by the regulator or police) may impact on the ability of the operator to complete an assessment within one year and these impacts should be notified to and agreed with the regulator. 433 The full assessment should consider what happened, how effective the plan was and how learning can be incorporated to ensure more effective emergency planning and response in the future. Although learning would be expected in all situations when emergency plans were implemented, the assessment undertaken should be proportionate to the event that occurred. For example, if the event was as a result of a perceived risk the assessment would not be expected to be as extensive in comparison to an off-site nuclear emergency involving release of radioactive materials to surrounding areas. The operator should lead on the assessment of the effectiveness of the operator's plan and the local authority should lead on the assessment of the effectiveness of the off-site emergency plan. The full implications of the radiation emergency may not be known

	for some time following the event. Dose assessments of internal radiation from long-lived radionuclides, such as actinides, may take many months to complete. The effects of contamination on crops, animals and fish, and their effects on the food chain may continue for many months. The impact of radioactive waste arising from the radiation emergency may also need to be assessed. Therefore the time within which a full assessment of the radiation emergency can be made will depend on the nature of the emergency. 434 When making both the provisional and full assessment of the event, the operator should consult with all organisations with a role to play in the operator's emergency plan. The local authority should consult with all organisations with a role to play in the off-site plan. 435 A key purpose of full assessments is to ensure knowledge is gained from the emergency, the response to it and the transition to recovery. To facilitate this, the assessment report should include: (a) the consequences of the event, (b) what went well (c) what did not go well, (d) how effective the plan was, (e) lessons identified; and (f) recommendations and actions for improving emergency plans (see regulation 12(4)(e)). 436 Lessons learned should be shared locally through local resilience networks and nationally where appropriate through the joint organisational learning process. The off-site emergency plan should be updated to incorporate relevant learning as per Schedule 6 Part 2 (2)(j).

Regulation 18 Emergency exposures: employees

Regulation 18	437 An emergency exposure is defined in regulation 2. 438 Decisions about the need for emergency exposures of employees and the emergency dose levels that apply are an integral part of emergency plan development. Operators should address these issues in an integrated way so that emergency exposure and dose level decision-making informs the process of intervention strategy development rather than becoming a last resort course of action in radiation emergency management. Emergency exposure arrangements provide the framework within which to manage the exposures of emergency workers who are likely to receive the highest doses and keep these doses as low as is reasonably practicable. Appropriate emergency management arrangements ensure that emergency responders are not put at unnecessary risk and ensures that they are not exposed to unnecessary radiation doses. 439 The operator should seek advice from a radiation protection adviser on emergency exposures. The operator should also have arrangements for providing advice on radiological conditions and hazards on the premises associated with the radiation emergency to the employers of other emergency workers, such as the emergency services. 440 The provisions of regulation 18 only apply for those incidents where a risk evaluation has identified the possibility that exposures to emergency workers in excess of the dose limits in the 2017 Regulations could occur, and where appropriate provision has been made in the emergency plan. The dose limits in the 2017 Regulations continue to

apply to all persons who are not identified as emergency workers.

441 Emergency exposures may be necessary for on-site emergency workers in the event of a radiation emergency but also before a radiation emergency is declared in order to prevent escalation or to mitigate consequences. Arrangements for determining when emergency exposures would be necessary must be written into emergency plans (see Schedule 6). It is unlikely that emergency exposures would be required for personnel working off-site, but this possibility is not excluded by the Regulations. Therefore, if the off-site emergency plan includes arrangements for such emergency exposures, the provisions of this regulation will apply, and arrangements for the management of those exposures for off-site personnel will be necessary.

442 In the event of an incident occurring which could lead to the authorisation of emergency exposures, expert advice on radiation protection should be available. Arranging for expert(s) to be available should form part of the emergency plans. Such experts may be RPAs as appointed under regulation 24, or they may be other individuals with appropriate qualifications and experience. Operators should provide emergency services and other responders with information on the radiological conditions and hazards on the site associated with the radiation emergency.

443 This regulation provides a management framework for controlling the exposure of emergency workers. The elements of this framework are as follows:

(a) planning - identifying emergency workers who can receive emergency exposures; ensuring they are prepared for the task by provision of training and equipment; making arrangements for medical surveillance and dosimetry that would be required; naming those who would take charge of managing emergency exposures; and specifying limiting dose levels for emergency exposures;

(b) implementation - checking that those who will receive emergency exposures are fit to be exposed and are properly equipped and instructed; managing the exposure of the emergency workers; ensuring that the limiting dose levels are not exceeded except in extreme situations to save lives; and determining the doses received in the emergency exposure;

(c) documenting the emergency exposures - ensuring that dose records are made and kept by approved dosimetry services; providing copies to affected employees; and making a report of the circumstances of emergency exposures and resulting actions.

444 The regulation places a number of duties on employers. This is because the duties refer to employees who may receive emergency exposures, and it needs to be clear that the duties fall on the employers of those employees, whether they be operators, or others, such as the emergency services. All the requirements that apply to emergency exposures stem from the identification in an emergency plan that emergency workers are likely to receive high doses of radiation, exceeding normal dose limits.

445 The Regulations permit an employee, during a radiation emergency or where action is required to prevent such an emergency, to receive a dose of ionising radiation in excess of the dose limits in the 2017 Regulations. This would include employees of the operator, contractors on the premises, emergency services and other responders (such as care assistants for people living in an affected area, bus drivers involved in evacuation of personnel or volunteers (as per regulation 18(11)). Emergency workers must only be allowed to receive emergency exposures for the purposes of bringing help to endangered persons, preventing exposure to other persons, or saving valuable installations or goods. This last circumstance would be particularly important if the integrity of the installation is crucial to the stability or containment of a radiation source. Indeed, emergency

	exposures may be authorised for on-site emergency workers before the release of any radioactive substance occurs from the premises and before the off-site emergency plan is formally implemented. 446 In the event that emergency exposures are or are likely to be necessary, the employer (operator, emergency service or other responding organisation) will need to manage the exposure to ionising radiation of emergency workers that they employ. One vital function is to authorise emergency workers to receive emergency exposures (see regulation 18(1)(g)) for which they need to have appropriate training.
Regulation 18(1a)	*(1) Where an emergency plan prepared pursuant to these Regulations provides for the possibility of any employee receiving an emergency exposure, each employer must, in relation to that employer's employees—* *(a) identify those employees who may be subject to emergency exposures;*
Guidance 18(1a)	447 Each employer should identify all of their employees who may receive emergency exposures. This may be by name, or by position or role (such as shift charge engineer, driver, or firefighter). If by position or role, then all individuals having that position or role should be known and be trained to undertake it. 448 Certain groups are not suitable for work incurring emergency exposures. These include those listed in regulation 18(5) (Ie. employees and trainees or apprentices under 18 years of age, and female employees who are either knowingly pregnant or breastfeeding). In other cases, consideration should be made as to whether an individual is suitable, taking account of medical advice where appropriate. 449 It is not necessary for those identified to be designated as classified persons under regulation 21 of the 2017 Regulations. Radiation emergencies are such rare events that they do not in themselves give rise to a duty to designate classified persons under that regulation. On the other hand it is quite in order to identify people who for their normal work are designated as classified persons. 450 In paragraph 86 of the ACOP to the 2017 Regulations, it is recommended that doses received by employees who would not normally be exposed to ionising radiation in the course of their work should be kept below the dose limits which apply to members of the public. It should be noted that the guidance in that paragraph is not relevant to REPPIR and should not be seen as preventing particular individuals being identified for being subject to emergency exposures.
Regulation 18(1b)	*(b) provide those 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;*
Guidance 18(1b)	451 The information, instruction and training received by employees should be fit for purpose enabling them to adequately fulfil their emergency worker roles. It should meet the requirements specified in Section 2 of HSWA for the provision of such information, instruction, training and supervision as is necessary to ensure, so far as is reasonably practicable, the health and safety at work of his employees. Employers should also provide periodic refresher training and training for newly identified employees who may be subject to emergency exposures. 452 Information, instruction and training provided for the purposes of regulation 18 is in addition to that provided for those employees who are affected by emergency plans

	(see guidance to regulation 10(7)). 453 The responsibility for provision of information, instruction and training rests with the employer of the employees concerned. The information and training for emergency workers included in emergency plans should be proportionate to the role they fulfil. The training requirements for those involved in direct intervention close to any source of radiation during an emergency are intended to be significant, detailed and continuing. Other training may be on-the-day briefing, orally or via some prepared written information. The duty lies with the emergency services or other responding organisation to provide training for its own employees. However, operators should be able to help with this (see also regulation 15(3)), and there are benefits from co-ordinating the training of on-site employees with those of the emergency services and other responders.
Regulation 18(1c)	*(c) provide such equipment as is necessary to restrict the exposure of such employees to ionising radiation;*
Guidance 18(1c)	454 Emergency workers may need equipment to enable them to deal with the incident but which will also enable them to restrict their exposure to ionising radiation. Remote handling tools may be necessary to manipulate sources or to manoeuvre apparatus in high external radiation fields. Employees may need to wear personal protective equipment such as respiratory protection to enable them to enter and work in areas containing high levels of airborne radioactive contaminants. Electronic personal alarm dose meters or dose-rate monitoring instruments, suitable for the types of radiation and dose rates likely to be encountered, should also be provided. In the event of a release of radioactive iodine, doses received by emergency workers can be restricted by administration of stable iodine tablets. 455 Equipment provided for the purposes of regulation 18 is in addition to that provided for those employees as per regulation 10(7). Arrangements for the issue of equipment for employees likely to receive emergency exposures should be described in emergency plans. 456 Emergency services and other responding organisations may need advice on the suitability of personal protective equipment to be worn by emergency workers. They are advised to discuss this with the operator in the first instance when they are developing their emergency plans. Other necessary equipment may be provided by the operator. 457 Preventative and protective equipment should reflect the risks in the role being undertaken.
Regulation 18(1d)	*(d) make arrangements for medical surveillance by an appointed doctor or employment medical advisor to be carried out without delay in the event of a radiation emergency in respect of those employees who receive emergency exposures;*
Guidance 18(1d)	458 Arrangements for medical surveillance need to be made in advance, but the medical examination need not take place until an emergency exposure has been received (although some classified emergency workers on the premises may have already received medical surveillance under regulation 25 of the 2017 Regulations). Medical surveillance should be carried out by appointed doctors or employment medical advisers, and should include special medical surveillance of any emergency worker who has received an emergency exposure. The nature of the medical surveillance for each individual should take account of the nature of the emergency exposure and that individual's state of health. Any individual should undergo a special medical examination (which may involve counselling the individual and detailing possible restrictions on further exposure)when: (a) they have received an effective dose of ionising radiation in excess of 100 milliSieverts in a year;

	(b) they have received an equivalent dose of at least twice any relevant dose limit specified in the 2017 Regulations; or (c) if the appointed doctor (or employment medical adviser) considers this to be necessary in the circumstances. 459 Regulation 25(2) of the 2017 Regulations requires that employers arrange for health records to be kept in respect of employees who are subject to medical surveillance. Such records are not essential for non-classified persons who receive emergency exposures, but employers may find it is useful to keep a record of the medical surveillance that has been conducted using a health record. If so, such a health record would normally be kept until the person to whom it relates has or would have attained the age of 75 years, but in any event not less than 30 years from when the record was made. Confidential clinical information should not be recorded in the health record. Note that the Data Protection Act 2018 contains data protection requirements relevant to any such health records, including the right of data subjects to see their health records.
Regulation 18(1e)	*(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 regulator;*
Guidance 18(1e)	460 Employees who may receive emergency exposures, and who are routinely involved in work with ionising radiation and are classified persons under the 2017 Regulations, will already have arrangements for dose assessments and medical surveillance made for them by their employers. These are likely to be employees of the operator. Consideration should be given to providing additional dosemeters to these employees (assuming that there is sufficient time to do this) when a radiation emergency is declared, so that doses received while they are undertaking tasks as emergency workers may be assessed separately from routine doses and be recorded separately in the dose record. Employers should be aware that in an emergency, there may be significant exposure from routes not covered by the arrangements for routine dosimetry. For example, classified persons may be monitored routinely for exposure only to external radiation, whereas during an emergency exposure they may also receive exposure to internal radiation. In such cases the employer should make suitable arrangements with appropriate approved dosimetry service(s) in addition to the one(s) used for the routine dosimetry. 461 There may be others who may receive emergency exposures but who do not routinely have dose assessments or medical surveillance. For a radiation emergency this may include: (a) employees who would only be exposed to ionising radiation during a radiation emergency, such as company firefighters; (b) employees of contractors on the premises; (c) employees of the emergency services; (d) employees of other responders such as care assistants for those living in an affected area or bus drivers involved in evacuation of personnel; and (e) volunteers as per regulation 18(11). 462 It may not be necessary or reasonable to provide all these responders with dosemeters routinely for use in case of a radiation emergency. Nevertheless, arrangements should be made to ensure that dose assessments can be made with an approved dosimetry service during a radiation emergency, with follow-up medical

	surveillance as necessary. For example, the operator may arrange to have a supply of dosemeters that can be distributed to such emergency workers during a radiation emergency. 463 Arrangements for the issue of dosemeters should be described in emergency plans. Arrangements for dose assessments should be made with an approved dosimetry service, and arrangements need to be in place for the service to notify immediately the results of those assessments to the employer and regulator.
Regulation 18(1f)	*(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; and*
Guidance 18(1f)	464 Arrangements should be in place to forward the dose assessments to the approved doctor or employment medical adviser who will be carrying out the medical surveillance.
Regulation 18(1g)	*(g) identify those employees who are 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.*
Guidance 18(1g)	465 When a radiation emergency occurs, there should be a person in authority who can permit employees to receive emergency exposures: (a) for the operator and any contractors on the premises - this is likely to be someone in a senior position within their own company who is available on the premises at the time of the radiation emergency; (b) for the emergency services and other responders - this is likely to be the person in charge, and decisions should be taken in consultation with the authorised person for the operator. 466 It is important to note that people authorised to permit emergency exposures should themselves be employed by the employer concerned. It follows, for example, that contractors and the emergency services should authorise one of their own employees for this function, and cannot rely on someone employed by the operator. 467 The training provided for people authorised to permit employees to receive emergency exposures is separate from (although related to) the training provided for employees who may receive emergency exposures. The training for authorisations needs to include a good understanding of the effects of high doses of ionising radiation and the risk this entails of deterministic effects (where the severity of the effect is related to the radiation dose, eg skin burns). Such people need to be clear as to the applicable restrictions applying to employees who receive emergency exposures (regulation 18(5) and 18(6)). The training needs to stress the importance of keeping a careful watch on the exposure rate and of keeping to the established dose levels for emergency exposures (see regulation 18(5)(c)) except where the conditions in regulation 18(7) apply. 468 It is recognised that the person authorised to permit emergency exposures may not be located close to the incident. It is likely that the management of the exposure may have to be delegated to a person close to the incident (eg forward control point). This person would also need to be suitably trained and experienced to undertake this delegated role.
Regulation 18(2)	*(2) Each employer must notify the regulator of the dose levels which that employer has determined are appropriate to be applied in respect of an employee identified for the purposes of paragraph (1)(a) in the event of an emergency.*

Guidance 18(2)	469 To set exposure levels, operators need to estimate the magnitude of likely doses for personnel in various functions. The exposure levels which are determined should normally be set at the maximum of such estimates. However, if the resulting exposure levels are seen to be excessively high, then the emergency plan may need to be revised to reduce the estimated dose levels to more tolerable values. 470 The operator should evaluate the dose levels of the emergency exposures that employees may receive to put into effect the operator's emergency plan. The operator should advise the employers of contractors, emergency services and other responders on relevant dose levels where necessary or requested. 471 When setting emergency exposure dose levels, the operator should take into account reference levels specified in regulation 20(1) and 20(7). 460 Emergency exposure dose levels should be notified to the regulator at least 28 days before work with ionising radiation commences. 472 Emergency exposure levels for all emergency workers (including on-site employees, emergency services with on-site roles, and emergency workers with off-site roles) should be notified to the regulator by the relevant employer. The requirements for emergency plans to cover arrangements for emergency exposures (see Schedule 6) and for consultation on emergency plans (see regulations 10, 11 and 15) together provide the framework for discussions between the operator and the employers of all emergency workers regarding emergency exposures. 473 There are nationally agreed exposure levels for some emergency services (Home Office/Scottish Office Technical Bulletin 2/93, Incidents involving radioactive materials34).* However, if the emergency plan envisages doses greater than these nationally agreed levels being received by emergency services personnel, the operator should consult the emergency services as to whether changes to those levels can be established for particular emergency situations, or whether other changes need to be made to the emergency plans to accommodate those nationally agreed levels. 474 The values chosen for exposure levels should make allowance for such personal protective equipment as is provided for use in the event of a radiation emergency (see regulation 18(1)(c)). For example, if emergency workers wear breathing apparatus, which provides uncontaminated air from an independent source, it may safely be assumed that there will be no inhalation of radioactive material during the intervention, and hence the internal dose from this exposure route may be disregarded. With other types of respiratory protective equipment, however, it may not be safe to assume there will be no inhalation of radioactive substances. In such cases, an appropriate protection factor should be used. 475 Additional guidance on doses for emergency exposures is in Advice for Public Health Protection in the Event of Radiation Emergencies, PHE, paragraph 5.3.1.
Regulation 18(3-4)	*(3)The notification required by paragraph (2) must be made in advance of the first occasion on which the operator of the premises in which the employee works undertakes work with ionising radiation to which these Regulations apply.* *(4) Where an employer 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 dose level should be determined, the employer must, at least 28 days before formally determining the revised dose level, or within such shorter time as the regulator agrees, notify the regulator of the revised dose level which the employer considers is appropriate to be applied.*

Guidance 18(4)	476 Regulation 18(3) provides for dose levels for emergency exposures to be revised if the need arises, perhaps resulting from a material change in the nature of the work undertaken, or a change to the response set out in the emergency plan by way of new techniques or new equipment for example.
Regulation 18(5)	*(5) In any case where, in the opinion of the regulator, the dose levels for exposure notified pursuant to paragraph (2) or (4) are too high, the employer must, if directed to do so by the regulator, substitute such other dose level or levels as the regulator considers appropriate.*
Guidance 18(5)	477 The regulator may decide that the dose levels for the emergency exposures are too high in relation to the likely benefits to be gained. In such cases, the regulator may require these dose levels to be changed. This may have a subsequent effect on the emergency plan, and require the procedures in the plan to be modified so that mitigation is still effective but emergency workers are exposed to lower doses of ionising radiation.
Regulation 18(6)	*(6) Where an emergency plan is put into effect pursuant to regulation 17, each employer must ensure—* *(a) that no employee of that employer who is under 18 years of age, no trainee or apprentice under the age of 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 that employer 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 the protective action taken in response to that radiation prioritises keeping the dose level below the dose level determined in accordance with paragraphs (2), (4) or (5).*
Guidance 18(6)	478 In the event of a radiation emergency, and when an emergency plan is being implemented in accordance with regulation 17, each employer should put into effect all the arrangements that have been made in respect of emergency exposures for their employees. In particular, and except in circumstances described in regulation 18(8), no employee should be exposed to a dose of ionising radiation greater than the effective dose level notified to and agreed with the regulator. 479 Those employees who have been authorised to permit other employees to receive emergency exposures will need to begin by reviewing the employees who are available to act as emergency workers, and those available employees will need to agree to receive an emergency exposure (although prior agreement may have been reached during the planning stages). Anyone under 18 years of age, or a female employee who is knowingly pregnant or breastfeeding, must first be excluded. Then any other employees considered to be unsuitable (see the guidance to regulation 18(1)(a))should also be excluded. 480 The exclusion of employees who have been involved in the incident which led to the radiation emergency should be considered. Individuals injured or otherwise incapacitated will not be suitable. Individuals who may have been overexposed to ionising radiation (having likely doses greater than the dose limits in the 2017 Regulations) may also be unsuitable, unless it can be confirmed by personal dosimetry that the doses received in the radiation accident do not approach the dose levels for emergency exposures. If any such individuals are permitted to receive emergency

	exposures, the doses received in the accident should be added to the emergency exposure for comparison with the dose levels established under regulations 18(2), (3) or (5).
Regulation 18(7)	*(7) The requirement imposed on the employer by paragraph (6)(a) in respect of a female employee who is pregnant or breastfeeding does not apply until that employee has notified the employer in writing of that fact or the employer ought reasonably to have been aware of that fact.*
Guidance 18(7)	481 Prevention of pregnant or breastfeeding employees from receiving emergency exposures depends on the employee informing the employer of her condition. Regulation 15 of the 2017 Regulations requires employers of female employees to ensure that they are informed about the possible risks and the importance of informing the employer in writing as soon as they are aware of their pregnancy. This is particularly important where a female employee has been identified under regulation 18(1)(a) of REPPIR as someone who may be subject to emergency exposures.
Regulation 18(8)	*(8) The requirement imposed by paragraph (6)(c) does not apply in respect of an exposure of any employee who—* *(a) having been informed about the risks involved in the implementation of an emergency plan, agrees to undergo an exposure greater than any dose level referred to in that sub-paragraph in order to save life, prevent severe health effects induced by ionising radiation, or to prevent the development of catastrophic conditions; 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.*
Guidance 18(8)	482 During a radiation emergency, events may not coincide with earlier predictions. In particular, people may be in in danger of death, and the only way to save their life would be for them to be rescued by emergency workers. In saving these people, the emergency workers may be in a situation where they would receive doses of ionising radiation in excess of the dose levels identified in the emergency plan for emergency exposures. In such circumstances, emergency workers who agree to receive doses in excess of these dose levels may be permitted to do so by an employee authorised to permit emergency exposures. Emergency workers should only be permitted to receive doses in excess of the dose levels for emergency exposures when the benefits to others outweigh the risks they will incur. Radiation protection advice would be particularly valuable in decision making, and the operator should provide information on the radiological conditions and hazards to inform such a decision. 483 The employer should consider making a record signed by the employees agreeing to receive, and by the employers permitting them to receive, doses above the dose levels confirming that the individuals concerned were informed about the risks involved in the intervention before agreeing to undergo such emergency exposures, and including the circumstances that justified such exposures in terms of saving human life. If this record is not made prior to the exposure, it should be made as soon as possible after the event.
Regulation 18(9)	*(9) Where an employee has undergone an emergency exposure, the employer must 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.*
Guidance 18(9)	484 Any employee who receives an emergency exposure must have that dose recorded in their dose record.

	485 If an employee received an emergency exposure when routine dosimetry was being worn, an estimate of the emergency exposure received should be made and this should be recorded separately in the employees dose record. Prior to any intervention which would be expected to resulted in emergency exposures, an emergency dosemeter should replace any routine dosimetery worn. 486 Arrangements with an approved dosimetry service must be made under 18(1)(e). If an employee receives an emergency exposure, and that employee does not normally work with ionising radiation and therefore has no dose record under the 2017 Regulations, then their employer must create a dose record for them. The employer should make arrangements with an approved dosimetry service to make and keep this dose record.
Regulation 18(10)	*(10) An employer must, at the request of that employer's employee in circumstances where a record has been created for the purpose of paragraph (9) 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.*
Guidance 18(10)	487 This provision allows employees to obtain personal dose monitoring information from the employer, and extends to emergency workers the right of classified persons and others under the 2017 Regulations to be made aware of such information.
Regulation 18(11)	*(11) In the event of a report being made pursuant to regulation 17(6) relating to the circumstances of an emergency exposure and the action taken as a result of that exposure, an employer shall keep such a report (or copy of the report)* *(a) until any person to whom the report relates has or would have attained the age of 75 years; and* *(b) in any event, for at least 30 years from the termination of the work which gave rise to the emergency exposure.*
Guidance 18(11)	488 Following a radiation emergency, the operator is required to make a full report of the consequences of the emergency. This should include the emergency exposures, medical surveillance and treatment received by emergency workers. Any information relating to emergency exposures, medical surveillance or treatment should be kept for the same period of time as the dose records of those personnel.
Regulation 18(12)	*(12) An employer who has a duty under this regulation must also comply with that duty as regards any person who regularly provides a service to that employer as a volunteer.*
Guidance 18(12)	489 Volunteers may include members of organisations such as the British Red Cross, Police Special Constabulary, HM Coastguard or St John's Ambulance who volunteer to carry out certain tasks in an emergency. Volunteers will be identified in the emergency plan. These volunteers should be considered as employees of the voluntary organisation for the purposes of these Regulations. Voluntary organisations will be under the direction of an emergency responder who accepts liability. 490 A volunteer should be provided with the same protection as paid employees who perform the same type of activity and all the requirements identified in this regulation apply. The information and training provided should be proportionate to the role being undertaken. 491 There may also be members of the public who present themselves on the day to help in the emergency. These "spontaneous workers" are not authorised to receive

	emergency exposures and the provisions of the 2017 Regulations apply. Anyone ignoring advice provided by those in authority not to enter areas restricted during an emergency are also not considered to be emergency workers.

Regulation 19 Disapplication of dose limits

Regulation 19(1)	*(1) Except in relation to a perceived risk arising from a radiation emergency, regulation 12 of the 2017 Regulations does not apply to an emergency worker, where that emergency worker—* *(a) is engaged in preventing the imminent occurrence of a radiation emergency; or* *(b) is acting to mitigate the consequences of a radiation emergency it is expected will occur or which has occurred.*
Guidance 19(1)	492 Regulation 19 provides for the disapplication of dose limits where necessary to respond to a radiation emergency or prevent the occurrence of radiation emergency. A procedure for disapplying dose limits should be written into emergency plans. The procedure should enable the person(s) making the judgement to be identified by role and state how they will be advised and whom they should inform. The person(s) will be a post holder identified by their role or job title and will be suitably trained to undertake the required tasks as required by regulation 18(1). 493 If a radiation emergency occurs or an event occurs which could lead to a radiation emergency, emergency plans would be implemented (regulations 17(1)), and emergency exposures for emergency workers may be authorised (regulation 18) to prevent the accident from escalating. 494 Emergency workers who have been authorised to receive emergency exposures may be exposed to doses in excess of the dose limits specified in the 2017 Regulations (regulation 12, Schedule 3, Part I, paragraphs 1 and 2). 495 This regulation applies when a radiation emergency will happen or is likely to happen if standard or emergency operating procedures fail to prevent the radiation emergency from occurring. It will not be appropriate for this regulation to be applied where the action necessary to respond to or prevent a radiation emergency can be done in such a way that restricts exposures to within normal dose limits. This regulation applies only in relation to radiation emergencies. Events which could not lead to a radiation emergency are not covered by these Regulations. 496 Dose limits would still apply to emergency workers who have not been authorised to receive emergency exposures, other people on-site (eg employees of other employers), and members of the public. **Re-application of dose limits** 497 Once help has been provided to endangered persons, exposure has been prevented to other persons and/or valuable installation or goods have been saved, emergency exposures cannot be applied and the 2017 Regulations dose limits will again apply. Every effort should be made to re-apply the dose limits in the 2017 Regulations in a timely manner (see principles and purposes of emergency plans in Schedule 7).

Regulation 20	**Reference levels**
Regulation 20(1-2)	*(1) The operator or local authority which has prepared an emergency plan in accordance with regulations 10 or 11, as the case may be, must ensure that the emergency plan prioritises keeping effective doses below a 100 mSv reference level.*
ACoP 20(1)	**498 Reference levels should relate to the total residual effective dose (the dose expected to be incurred by an individual after protective action have been implemented) estimated to be received both during the emergency (acute) and, for members of the public, over the first year following the emergency (annual).** **499 Reference levels for members of the public should include doses from the longer term exposure pathways of ingestion, resuspension and external irradiation from deposited gamma-emitting radionuclides.**
Guidance 20(1)	500 Notwithstanding the overriding principle of restriction of radiation exposures to as low as reasonably practicable, regulation 20 provides that the operator's emergency plans and the local authority's off-site emergency plans must prioritise reducing doses to all persons below an effective dose of 100mSv. These persons include employees of the operator (such as all employees on the premises and identified emergency workers employed by them), other emergency workers, and members of the public. 501 In exceptional circumstances, such as saving life, the reference level for emergency workers may be up to an effective dose of 500 mSv. 502 Reference levels are: a) an emergency planning tool aimed at achieving an optimised response over all relevant exposure pathways and protective actions; b) an indicator of the level of exposure considered as tolerable, given the prevailing circumstances; and c) values to inform decisions on protective action and support the practical implementation of the optimisation principle when the response to an emergency is underway. 503 Operators should describe in their emergency plan the lowest appropriate reference levels for groups or categories of emergency workers who have a role in the operator's emergency plan and for other employees on the premises. 504 Local authorities should describe in their emergency plan the lowest appropriate reference levels for groups or categories of emergency workers who have a role in the off-site plan and for members of the public that is appropriate to potential radiation emergencies at the site relevant to the plan. For emergency workers in the off-site plan, such as the emergency services, local authorities will obtain this information from the employers of these workers who have determined relevant levels in accordance with regulation 18(2). For members of the public, local authorities should take advice from PHE. 505 For emergency workers, the values chosen should be chosen in consideration of the doses likely to be incurred during the event or tasks expected to be undertaken within the appropriate plan. Employers should seek advice from an RPA in identifying these levels. 506 No emergency arrangements should plan for exposures in excess of the identified relevant reference level; although reference levels are not a dose limit, and, in the event

	of a severe emergency it may be appropriate for them to be adjusted or exceed.
Regulation 20(2)	*(2) The operator or local authority must record in the emergency plan for which it is responsible the appropriate dose level for each emergency worker as determined by the employer in accordance with regulation 18(2).*
Guidance 20(2)	507 Reference levels must be recorded in emergency plans, and notified to the regulator under regulation 18(2). Providing the record relates to all emergency workers in the emergency plan, these may be identified by relevant groups or categories of emergency workers as appropriate.
Regulation 20(3)	*(3) Where the response to a radiation emergency is underway, reference levels determined for emergency workers in accordance with regulation 18(2) may be revised or introduced in relation to specific tasks by that emergency worker's employer in order to optimise the response.*
Guidance 20(3)	508 Wherever possible, employers should seek advice from an RPA in identifying these levels.
Regulation 20(4-7)	*(4) In exceptional circumstances, in order to save life, to prevent severe radiation-induced health effects or to prevent the development of catastrophic conditions, a reference level for an effective dose for an emergency worker from external ionising radiation may be set by an employer in excess of 100 mSv but not exceeding 500 mSv.* *(5) Where the response to a radiation emergency is underway, specific reference levels, to optimise the response, may be determined by the local authority in whose area an off-site emergency plan is in place.* *(6) In determining specific reference levels under paragraph (5), the local authority must take advice from the person coordinating the off-site response to the radiation emergency.* *(7) The Secretary of State may also set a reference level whether applicable locally or nationally in addition to any reference level set under paragraph (5).*
Guidance 20(4-7)	509 During a radiation emergency and in a transition to a non-emergency situation, emergency response plans are adapted to the specific emergency taking place and reference levels may need to be developed accordingly. This may involve adjustment of previously identified reference levels relevant to the circumstances and/ or the setting of additional reference levels for specific tasks or groups of persons. 510 The local authority must take advice from the person coordinating the off-site response to that emergency. This person is usually the Chair of the Strategic Coordinating Group (SCG) at the Strategic Coordinating Centre (SCC) who will, in consultation with radiation protection and emergency response experts such as the Scientific and Technical Advice Cell (STAC), advise the local authority as appropriate. 511 For members of the public, reference levels may relate to specific groups of people or geographical locations as occurred at Fukushima. In these circumstances, optimisation of the response will be in relation to doses likely to be incurred during and over 12 months following termination of the emergency. These reference levels will assist Local Authorities in considering options for recovery planning, and those recovery options which could be put in place over the first year to reduce doses.
Regulation 20(8)	*(8) Any revision of the reference levels in response to a radiation emergency made in*

	accordance with paragraph (3), (4), (5) or (7) must be recorded in the report required by regulation 17(6).

Regulation 21 Prior information to the public

Guidance 21	512 The purpose of this regulation is to ensure the population within detailed emergency planning zones are appropriately informed and prepared in the unlikely event of a radiation emergency and that members of the public in the outline planning zone have access to information should they require it. The understanding and co-operation of those affected should enhance the effectiveness of the protective action. In the event of an emergency the public may receive or be directed to information from a variety of sources. Providing prior information should help to ensure that the public are aware of the official sources of information which in turn should help to reduce the likelihood of members of the public taking unwarranted action. 513 Compliance with this regulation should form part of a broader strategy of communication with the local community. Greater dialogue is aimed at increasing the effectiveness of messages given to those who could be affected. While hard copy and electronic information must always form part of the communication strategy, it does not preclude the parallel use of other means of communicating. These could include some combination of advertising in the local media, forming local liaison committees, organising exhibitions, holding public meetings and arranging site visits and open days.
Regulation 21(1-3)	*(1) The local authority which has responsibility for an area covered by an off-site emergency plan with a detailed emergency planning zone must, in cooperation with the operator, ensure that members of the public are made aware of the relevant information, and, where appropriate, are provided with it.* *(2) The local authority which has responsibility for an area covered by an off-site emergency plan with an outline emergency planning zone must, in cooperation with the operator, ensure that members of the public have access to the relevant information.* *(3) The relevant information referred to in paragraphs (1) and (2) is—* *(a) where the area is covered by a detailed emergency planning zone only, the information set out in Part 1 of Schedule 8 only;* *(b) where the area is covered by an outline planning zone and a detailed emergency planning zone, the information set out in paragraphs 8 and 9 of Schedule 8 in addition to the information set out in Part 1 of Schedule 8;* *(c) where the area is covered by an outline planning zone only, the information set out in Part 2 of Schedule 8.*
ACOP 21(1)-(2)	**514 Prior information should be supplied in an appropriate manner to members of the public who are in the detailed emergency planning zone, without their having to request it, so far as reasonably practicable.** **515 Prior information should be available in an accessible format to members of the public within the outline planning zone. If members of the public request such information they should be directed to it or provided with it in hard copy if requested.**

Guidance 21(1-3)	516 Once the detailed emergency planning zone and / or outline planning zone have been determined, the local authority is responsible (in cooperation with the operator) for ensuring that prior information is provided / made accessible in an appropriate manner within those areas. The information must cover at least the items specified in the relevant part(s) of Schedule 8 (see guidance to Schedule 8). Prior information needs differ between members of the public in the different zones. Within the detailed emergency planning zone, the co-operation of the public in planned urgent protective action is necessary in the event of a radiation emergency. Within the outline planning zone, members of the public are less likely to be affected directly by urgent protective action but may still want prior information and updates (see ACOP paragraph 514). 517 The local authority should identify members of the public who may require alternative forms of information. For example, if there is a school for the visually impaired in the planning zone, Braille or audio tapes may be prepared for visually impaired members of the public. The importance of the effective communication of information to children as well as adults should be borne in mind, for example using educational packages in schools and colleges and through the use of videos. The local authority should also identify areas containing a significant community whose main language is not English, in which case the information should be translated. The different communication needs of the population should be taken into account as far as is reasonably practicable. 518 Further guidance on considerations for prior information is available in Schedule 8. **Detailed Emergency Planning Zone** 519 Within the detailed emergency planning zone the information should be proactively provided to the public without them having to ask for it. This also applies to pockets of detailed planning within the outline planning zone (see paragraph 754 for further guidance). The most common method is to produce booklets for distribution to individual households. It has to be recognised that in an emergency some people may not find their information booklets quickly and these are often reinforced with summarised safety instructions in publications that tend to be easily accessible in the home, such as a calendar or durable card. 520 All the required information does not have to be distributed as a single document, although there are benefits in keeping the information together which should be considered. While most of the items of information listed in Schedule 8 are related to the emergency circumstances, so will depend on the potential radiation emergencies which have been identified, paragraph 1 concerns basic facts about radioactivity and its effects on people and on the environment. For this local authorities could, if they wish, use a standard booklet produced by another organisation, as long as it is clear, concise, accurate and appropriate for this application. If separate documents are used in this way, they should still be distributed together. 521 The information should also be made available to members of the public electronically. The local authority should decide how this is to be achieved but could, for example, make the information available on their website and provide a link to it in the hard copy version of the prior information. The link could also be provided on the websites of the operator and other responding organisations. 522 Special arrangements may be needed for commercial, industrial and public authority premises, shops, hotels, multi-occupied dwellings, campsites etc. and options include displaying information in these locations. Regular visitors to the area, such as those making milk and postal deliveries, also need to be considered. Such regular visitors are probably best informed through the base from which they work (for example milk

	depot, sorting office) which may not be situated within the detailed emergency planning zone. The needs of regulator visitors to the area should be taken into account so far as is reasonably practicable. Associated local publicity at the time of distribution may help to highlight any shortcomings in the arrangements for other identifiable transient populations. 523 Where the detailed emergency planning zone covers more than one local authority, the lead local authority may wish to make arrangements with the other local authorities to assist in the dissemination of prior information. 524 Where a premises is also subject to regulation 18 of COMAH (Provision of information to persons likely to be affected by a major accident at an upper tier establishment), it would normally be sensible to present the information about chemical and radiation hazards together and the local authority can coordinate this. Where members of the public are located within more than one detailed emergency planning zone, the local authority should consider the benefits of providing a single set of information covering all relevant premises. **Outline Planning Zone** 525 In the outline planning zone prior information should be available to members of the public if they request such information. It does not need to be distributed to members of the public as in the case of the detailed emergency planning zone. The appropriate information must be available electronically, for example on the local authority website, and there should be arrangements in place to direct members of the public within the outline planning zone to this information if it is requested by them and to provide it in hard copy if requested. Links to the information could be also be added to the websites of the operator and other responding organisations. Where multiple outline planning zones overlap, the local authority should consider the benefits of producing a single set of information covering all relevant premises.
Regulation 21(4)	*(4) In preparing the information to be provided in accordance with paragraphs (1) and (2), the local authority must consult such persons who seem to that local authority to be appropriate.*
ACOP 21(4)	**526 In preparing the prior information the local authority should consult the operator, each local authority in the detailed emergency planning zone and / or outline planning zone and the organisations that are named in the prior information, in addition to any other persons the local authority considers appropriate.**

Guidance 21(4)	527 The local authority, operator and responding organisations should work together when developing and publishing public information. Since local authorities have the duty to supply the information to the public, they also have the final responsibility for its accuracy, completeness and form; cooperation and consultation will help to achieve this. 528 In communicating with the public, consultation with other tiers of local authority will help to ensure the best use of local knowledge and expertise. 529 The local authority would normally need to consult the emergency services; health authority/board for the area where the premises are situated, certain government departments and agencies. 530 Prior information may trialled on representative groups of people for whom it is intended.
Regulation 21(5-6)	*(5) The information to which members of the public are to be provided or to have access in accordance with paragraphs (1) and (2) must be made available to them both electronically and in hard copy.* *(6) The local authority must review, and where necessary revise, the relevant information referred to in paragraph (3)—* *(a) at regular intervals, but in any case not exceeding three years; and* *(b) whenever significant changes to the protective action or authorities referred to in paragraphs 3, 4 and 5 of Schedule 8 take place.*
Guidance 21(6)	531 Changes that would be considered significant in accordance with regulation 21(5)(b) relate to: (a) major variations in the activities that can give rise to a radiation emergency (the local authority would be informed of such changes by the operator in the consequences report under regulation 7); (b) the system of warning of a radiation emergency; (c) the means by which people can continue to keep themselves informed during a radiation emergency; (d) the protective action; (e) the system of distribution of stable iodine tablets; (f) the evacuation arrangements; (g) the off-site organisations with key responsibilities in implementing the emergency plans; and (h) other important features of the emergency plans which will have a practical impact on the population likely to be affected. 532 The local authority should also review and revise the information when the boundary of the detailed emergency zone is re-determined or there is a change in the extent of the outline planning zone. 533 The local authority, operator and responding organisations should co-operate on the revision of the information and the local authority should consult on the changes with the appropriate persons.
Regulation 21(7)	*(7) Where the information has been revised in accordance with paragraph (6) the local authority must ensure that the revised information is made available to members of the public who have property in or who are in the area covered by the local authority, in accordance with paragraph (1) or (2) as appropriate.*

Guidance 21(7)	534 Where the information has been revised in accordance with regulation 21(6) the information must be resupplied to members of the public in the detailed emergency planning zone and information made available to members of the public elsewhere, must be updated as appropriate. This must be done as soon as reasonably practicable after the revision (see regulation 21(9)(b)). As part of the review undertaken in accordance with regulation 21(6) the methods for supplying information and making information available in the outline planning zone may also need to be reviewed and amended as necessary. 535 Where the detailed emergency planning zone is re-determined the information should be supplied to any new members of the public within the area. Where members of the public are no longer within the detailed emergency planning zone, they should be notified of this.
Regulation 21(8)	*(8) The operator must not carry out the work with ionising radiation to which the evaluation made in accordance with regulation 4(1) or 6(1) applies before the information referred to in paragraph (3) is supplied.*
Guidance 21(87)	536 In order to make an adequate off-site emergency plan, ACOP paragraph 514 requires prior information to be supplied in accordance with this regulation. Prior information should therefore be supplied / made available by the time the plan comes into effect.
Regulation 21(9)	*(9) The local authority must ensure that the information is made available in accordance with paragraph (1) or (2) again—* *(a) at intervals not exceeding three years; and* *(b) if it is revised pursuant to paragraph (6), as soon as reasonably practicable after the revision.*
Guidance 21(9)	537 In addition to updating and resupplying the information, either as part of the regular three-yearly review programme or following significant changes to the emergency arrangements (see regulation 21(6)), the information must be resupplied to members of the public in the detailed emergency planning zone at least every three years. 538 The reason for repeating the information at regular intervals, regardless of whether there have been significant changes in the meantime, is to cater for changes in the population likely to be affected, such as new housing or industrial developments, and as a refresher for those who have previously been informed. Three years is the maximum permitted interval, but redistributing the information more often may increase the likelihood of the key messages being remembered. The frequency of resupply of the information needs to be gauged against these factors. Local authorities may wish to resupply prior information routinely on a more frequent basis.
Regulation 21(10)	*(10) Where a report is made pursuant to regulation 7, the local authority must make that report available to the public as soon as reasonably practicable after it has been sent to the regulator under that regulation (except that, with the approval of the regulator, the local authority must not make available any part or parts of such report for reasons of industrial, commercial or personal confidentiality, public security or national security).*
ACOP 21(10)	**539 The local authority should co-operate with the operator to identify whether any information should be excluded in the publically available consequences report.** **540 The operator should make a written request to the regulator and the local**

	authority to withhold any information identified in accordance with paragraph 539 at the time of submitting the consequences report to the local authority. **541 The revised report should be made available to the public by the local authority as soon as is reasonably practicable after the regulator has given approval to withhold information.** **542 The local authority should ensure that publically available versions of the consequences report are updated when changes are made under regulation 7(4).**
Guidance 21(10)	543 When preparing the consequences report the operator may choose to ensure that the report, as a whole, is suitable for the public domain. Otherwise, the local authority must exclude certain parts of the consequences report if the information is industrially, commercially or personally confidential, or where public security or national security may be compromised if it were released, and should co-operate with the operator to identify such information. The information which can be withheld might include, for example, details of processes and special techniques, intellectual property and information which is not available elsewhere or is particularly valuable and information that may compromise public or national security. 544 It may be appropriate to provide a summary of the report in plain language and again the local authority should liaise with the operator to prepare this. 545 It is for the local authority to determine the best mechanism for making reports available to the public and to help members of the public locate such reports, including on the internet or other relevant communication channels (including providing links on relevant stakeholder websites) and in local public libraries. 546 It is not a requirement of REPPIR for the consequences report to be given to members of the public who request it or for the report to be proactively distributed. It is sufficient that it is published in places to which the public has access and can be directed to.

Regulation 22 Duty of local authority to supply information to the public in the event of an emergency

Regulation 22	547 Regulation 22 applies to all local authorities whether or not they have REPPIR premises in their area. It relates to general duties on local authorities to have arrangements to provide information about any kind of emergency involving ionising radiation (referred to as an 'emergency' in this regulation and associated guidance) and is therefore not limited to emergencies occurring on nuclear or radiological sites. Regulation 22 therefore applies to transport radiation emergencies, in addition to other types of emergency not otherwise covered by the rest of these Regulations (for examples and further guidance on the definition of 'emergency' see regulation 22(6)). Other requirements for transport radiation emergencies, including prior information, are included in CDG. 548 The context of this regulation is planning for situations where an emergency has

	already occurred. Such planning is easier for premises of known hazard potential, but will be more difficult for events of unpredictable location and nature, such as transport radiation emergencies, a fallen nuclear powered satellite, or radioactive contamination being present in a public area. 549 The purpose of this regulation is to ensure that those members of the public actually affected by an emergency are informed promptly of the facts of the emergency and the protective action. For this reason the arrangements should be adaptable dependant on the nature and extent of the emergency. 550 This regulation is for the benefit of those on whom the protective action may have a direct impact. It is not concerned with informing the wider public, important though prompt and accurate reporting would be in such circumstances.
Regulation 22(1)	*(1) Every local authority must prepare and keep up to date arrangements to supply, in the event of an emergency in that local authority's area (however that emergency may arise), information about and advice on the facts of the emergency, of the steps to be taken and, as appropriate, of the protective action applicable.*
Guidance 22(1)	551 Every local authority must make and keep up to date arrangements to supply information and advice to the public in the event of an emergency affecting members of the public within its area. This duty applies to all local authorities, regardless of whether there is a REPPIR premises in their area. It is intended to reinforce the relationship between making arrangements to supply information and emergency planning. Where a local authority has an off-site emergency plan under these Regulations, the arrangements for supplying information to the public about radiation emergencies as defined in REPPIR should be included within the plan. Each organisation that has a role to play in responding to an emergency has its own emergency arrangements. The role of the local authority is to ensure that the arrangements for providing information come together in a complementary and comprehensive way to form the arrangements required by this regulation. The collective arrangements should therefore consider how and from whom the information will be obtained. 552 There is no requirement for the local authority to prepare the information and advice themselves. For premises, the information and advice will usually be provided by other organisations, as outlined in the organisation's emergency arrangements and the off-site emergency plan, where one exists. To cope with emergencies that are unpredictable in nature, location and timing, such as transport radiation emergencies, the arrangements to inform those affected will of necessity be less detailed and more flexible. Most local authorities and other Category 1 responders already have communication arrangements in place under duties within CCA which could be used as a basis for providing the information required by this regulation. 553 The key communication objectives in an emergency response are to deliver accurate, clear and timely information and advice to the public aimed at helping them to feel safe and well informed. Arrangements should be sufficiently flexible and extendable to address the wider range of emergencies to which this regulation applies and to address any escalation of events. 554 Local authorities should consider how the information will be conveyed and should consider the relevant points in paragraph 740 under regulation 21. Any pre-prepared messages should also be tested and periodically reviewed. 555 If an emergency has not occurred, but an event has occurred which could reasonably lead to an emergency, it is important to avoid creating undue alarm so care

	needs to be taken when deciding what information is provided and in what format whilst ensuring openness and transparency. Members of the public should be provided with the necessary factual information to enable them to understand the situation and respond in an appropriate manner if necessary. 556 Where there is the potential for a REPPIR radiation emergency to arise based on perceived risk, the communication arrangements should aim to provide reassurance to the public and manage local concerns. Such arrangements should form part of the emergency plans prepared under these Regulations (see paragraph xxx).
Regulation 22(2)	*(2) The arrangements prepared and kept up to date under paragraph (1) must provide for the information to be supplied at regular intervals in an appropriate manner, without delay, and without their having to request it, to members of the public who are in that local authority's area and who are actually affected by the emergency.*
Guidance 22(2)	557 The information arrangements should be directed towards those members of the public actually affected by an emergency. This group of people is more precisely defined by regulation 22(5). 558 The arrangements should ensure that, if an emergency occurs, the information is given to members of the public immediately, or, if considered necessary, before actual declaration of an emergency. The degree of detail will depend on the circumstances at the time. There could be some situations where an event has occurred and where a release of radioactivity is anticipated but has not yet occurred. This may allow time for greater breadth and depth of information to be supplied. In situations where speed of action is paramount or where there is a lack of information the initial alert may be restricted to a very basic message. As the emergency unfolds, more detail can be provided. The arrangements should ensure that information continues to be supplied in a way that is regular, appropriate, timely and unprompted. 559 Information may be supplied by the local authority itself or other organisations. The arrangements for supplying information should adopt an integrated approach to communicating with the public to ensure consistent messaging. 560 For premises with off-site emergency plans, arrangements may already exist with local media and other communication organisations to disseminate information and these may have been specified in the prior information and the off-site emergency plan and be part of the implementation arrangements of regulation 17. For other emergencies, a more generic approach may be required so that information can be relayed promptly and so that those affected can be told where to access information. 561 The methods available to deliver urgent information to members of the public are extremely varied and some will depend on the availability of power supplies or phone lines. Using a range of public communication channels should maximise the success of delivery of key messages. Consideration should be given to how community groups and vulnerable people will be reached, for example using any existing community resilience networks. 562 Arrangements should enable the identification of the most appropriate transmission method(s) of information, for instance verbal and written, and the most appropriate communication channel(s), for instance by the police, radio, television, internet or social media. Such arrangements should take into account that the situation may be fast moving. Messages should be consistent but it may be appropriate to provide different information through different channels. For example, some channels may be more appropriate for delivery of key messages which can be quickly understood such as radio, television,

	social media etc., whilst provision of more detailed information, to ensure openness and transparency, may be provided through other channels such as websites. 5630 Further guidance on communicating with the public in an emergency is available in the Cabinet Office Guidance on Emergency Preparedness (Chapter 7: Communicating with the public), Preparing Scotland, Warning and Informing Scotland, Communicating with the Public guidance and NNEPRG.
Regulation 22(3)	*(3) In preparing those arrangements and in keeping them up to date, the local authority must consult any other authority likely to be responsible for implementing the relevant protective action referred to in Schedule 9 and such other persons as appear to it to be appropriate.*
Guidance 22(3)	564 Given the nature of the information arrangements, the consultation required by regulation 22(3) is essential to ensure that the roles played by different authorities dovetail effectively. Organisations likely to require consultation are a local authority involved in dissemination of prior information under these Regulations (if a different local authority to the local authority preparing the arrangements), any relevant operators, consignors of radioactive material, emergency services, the Agency, health authorities/boards and certain government departments. Where relevant, this could be done as part of the statutory consultation when preparing off-site emergency plans. 565 Some organisations may have responsibilities to issue advice or legal notice regarding protective action in Schedule 9 (for example water companies would consider that it is their duty to inform their customers of any restrictions on consumption of water supply). This should be taken into account when the local authority is setting up its arrangements and consulting on them, for example, local authorities will need to discuss this with the relevant organisation and come to a local agreement on how the advice will be supplied
Regulation 22(4)	*(4) The information and advice to be supplied in accordance with arrangements prepared and kept up to date under paragraph (1) must, if relevant to the type of emergency, include that specified in Schedule 9 and must, in any event, mention the authority or authorities responsible for implementing the relevant protective action referred to in that Schedule.*
Guidance 22(4)	566 This identifies the content of the information to be supplied as being that specified in Schedule 9, but only in so far as it is relevant to the type of emergency that has occurred. Schedule 9 is more indicative than prescriptive in nature. This contrasts with the prior information required by regulation 21, where the list in Schedule 8 is a minimum requirement. (For further guidance on the content of the information, see guidance to Schedule 9.)
Regulation 22(5)	*(5) For the purposes of paragraph (2), the members of the public referred to in that paragraph as actually affected are those whose cooperation is sought to put into effect any steps or protective action referred to in paragraph (1).*

Guidance 22(5)	567 The essential purpose of regulation 22 is to supply information to members of the public 'actually affected by an emergency'. Regulation 22(5) defines this group of people as those whose co-operation is sought in implementing the protective action. This group of people will include, for example: (a) those asked to shelter, evacuate or take 'stable iodine' tablets; (b) those asked to refrain from eating or selling foodstuffs they have grown themselves; or (c) those with restriction on use of water supplies. 568 Alternatively, people living further afield who cannot obtain a particular foodstuff because of restrictions that have been imposed do not meet the definition of being actually affected. This is because the need for their co-operation to put into effect protective action does not arise. 569 For premises of known hazard potential it is possible to consider who may be affected by the emergency at the planning stage. For events of unpredictable location and nature, such as transport radiation emergencies, members of the public actually affected can only be identified at the time of the emergency, requiring greater flexibility in the arrangements for providing information.
Regulation 22(6)	*(6) In this regulation, "emergency" includes a radiation emergency, but also includes any other emergency (whether within the United Kingdom or otherwise) which does or could have the same impact as a radiation emergency in Great Britain.*
Guidance 22(6)	570 For the purposes of regulation 22 only, the term 'emergency' refers to any kind of emergency involving ionising radiation, whether or not the initiating event occurs in the United Kingdom, which could lead to exposure to ionising radiation of persons within Great Britain. This includes, for example, radiation emergencies as defined in these Regulations at premises, emergencies during the transport of radioactive material, fallen nuclear powered satellites, radioactive contamination being present in a public area, and releases of radiation from overseas nuclear power plants.

Regulation 23 Retention of information

Regulation 23	*Each operator and each local authority which has duties by virtue of these Regulations must retain the information they are required to prepare, in particular under regulations 4 to 12 and 17, and must produce that information if requested to do so by the regulator or the Secretary of State.*
Guidance 23	571 This requires operators and local authorities to consider how long records should be retained as part of their approach for demonstrating compliance with each of their duties under these Regulations. 572 The records retained by operators and local authorities includes records explicitly required by these Regulations (such as a written evaluation required by regulation 4,emergency plans required by regulations 10 and 11, and, for some employers, the RPA appointment required by regulation 24(2)). They should also include any other records

	underpinning compliance with these Regulations (such as justification that a source is non-dispersible for the purposes of regulation 3(5)). Employers have general and specific requirements to retain information in other legislation such as Health and Safety at Work Act etc and the 2017 Regulations. For example retention of employee training records and records of examination for personal protective equipment. 573 Duty holders should ensure that adequate paper or electronic records are held for a period necessary to demonstrate compliance with these Regulations. All records must be retained for at least the period of their validity. Supporting records (e.g. references within documents or a written evaluation that may be subject to a declaration of no change under regulation 6(2)(b)) should be retained for at least the same period as their overarching record. Duty holders should take account of other relevant legislative requirements and standards such as the Data Protection Act, the 2017 Regulations, licence conditions for nuclear licensed sites, and ISO 15489-1:2016 (Information and documentation - Records management). Regulations 17(8) and 18(10) specify minimum retention periods which must be complied with. 574 An effective records management system will assist in controlling records and demonstrating compliance to the regulator. This should include a retention schedule which details the type of records to be kept and their retention and review periods.

Regulation 24	**Radiation protection adviser**
Guidance 24	575 The requirements in regulation 24 to consult a radiation protection adviser (RPA) are additional to those in the 2017 Regulations and relate specifically to advice concerning the employer's preparations for responding to radiation emergency situations. Employers may need a range of emergency planning specialist advice in addition to the radiological protection advice provided by the RPA.
Regulation 24(1-2)	*(1) Every employer which carries out work with ionising radiation must consult one or more suitable radiation protection advisers about occupational and public exposure to assist with that employer's preparations for responding to radiation emergency situations.* *(2) Where an employer consults a radiation protection adviser pursuant to the requirements of paragraph (1) (other than in respect of the observance of that paragraph), the employer must appoint that radiation protection adviser in writing and must include in that appointment the scope of the advice which the radiation protection adviser is required to give as if the employer were an employer under the 2017 Regulations.*
ACOP 24(1-2)	**576 To be suitable for the purposes of these Regulations, an RPA will need to have the specific knowledge, experience and competence required for giving advice on preparedness and response in radiation emergency situations for which the employer is making the appointment.** **577 Employers are required to consult an RPA where advice about occupational and public exposure is necessary for compliance with the Regulations. This should**

	include: **(a) contingency planning;** **(b) emergency procedures; and** **(c) remedial actions.**
Guidance 24(1-2)	578 A RPA is defined in regulation 2 of the 2017 Regulations. Employers must select suitable RPAs, one or more who have the specific knowledge, experience and competence required for giving advice on the particular working conditions or circumstances for which the employer is making the appointment. In addition to the specific matters set out in Schedule 4 of the 2017 Regulations, employers are required to consult an RPA where advice is necessary for compliance with these Regulations with regard to preparedness and response in emergency exposure situations. 579 The advice of the RPA should cover, where relevant, but not be limited to contingency planning, emergency procedures and remedial actions. The Health and Safety Executive (HSE) statement on RPAs requires a basic understanding for all RPAs in these areas. As the 2017 Regulations apply in the event of a radiation emergency, RPAs appointed under the 2017 Regulations are expected to have sufficient knowledge and understanding to advise operators accordingly. 580 General advice on RPAs including choosing, consulting, appointing and availability of RPA advice is described in the guidance for the 2017 Regulations, paragraphs 250-259. 581 The 2017 Regulations specify when an RPA does not need to be consulted. These exemptions apply equally to these Regulations. In addition to these exemptions, an RPA only needs to be consulted as per Regulation 24 for activities which are within the scope of these Regulations.
Regulation 24(3)	*(3) The employer must provide any radiation protection adviser appointed by it with adequate information and facilities for the performance of the radiation protection adviser's functions arising from their consultation or appointment under this regulation.*
Guidance 24(3)	582 Employers must make sure that their RPAs have access to all the information and facilities that they need to perform their duties effectively. The facilities may need to include appropriate administrative support and radiation monitoring services.

Regulation 25 Modifications relating to the Ministry of Defence etc

Regulation 25	*(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( ); and* *(b) "headquarters or organisation" is a reference to a headquarters or organisation designated for the purposes of the International Headquarters and Defence Organisations Act 1964( ).* *(2) The Secretary of State for Defence may, in the interests of national security, by a certificate in writing, exempt—* *(a) Her Majesty's Forces;*

	(b) visiting forces; *(c) any member of a visiting force working in or attached to any headquarters or organisation; or* *(d) any person engaged in work with ionising radiation for, or on behalf of, the Secretary of State for Defence,* *from all or any of the requirements or prohibitions imposed by these Regulations and any such exemption may be granted subject to conditions and a limit of time and may be revoked at any time by a certificate in writing.* *(3) The requirements of regulation 18 do not have effect in relation to Her Majesty's Forces to the extent that compliance with those requirements would, in the opinion of the Secretary of State for Defence, be against the interests of national security.*

Regulation 26 Disclosure of information

Regulation 26	*Where any person is entitled to seek any information from an operator under these Regulations, the Secretary of State may certify in writing that, in the opinion of the Secretary of State, the provision of that information would be contrary to the interests of national security.*

Regulation 27 Revocation

Regulation 27	*The Radiation (Emergency Preparedness and Public Information) Regulations 2001 (S.I. 2001/2975) are revoked.*

Regulation 28 Transitional and savings provisions

Regulation 28	583 This regulation sets out a 12 month transitional period for existing duty holders under REPPIR 2001, and a 12 month transitional period for those not previously captured by REPPIR 2001 who would now be captured by REPPIR 2019. 584 Existing REPPIR 2001 duty holders may continue to comply with REPPIR 2001 until the end of that transition period, at which point they must be compliant with REPPIR 2019. 585 Duty holders not previously captured by REPPIR 2001 and are now be captured by REPPIR 2019 also have a 12 months transitional period to become compliant with REPPIR 2019.
Regulation 28(1-3)	*(1) Any person who had a duty under the Radiation (Emergency Preparedness and Public Information) Regulations 2001 ("the 2001 Regulations") prior to these Regulations coming into force may continue to comply with the provisions of the 2001*

	Regulations instead of the provisions of these Regulations, notwithstanding the revocation made in regulation 27, until the end of 21st May 2020. *(2) A person who had a duty under the 2017 Regulations, but not the 2001 Regulations, prior to these Regulations coming into force is not subject to a duty under these Regulations until the end of 21st May 2020.* *(3) From the start of 22nd May 2020, these Regulations must be complied with in full, save that:* *(a) any test of an emergency plan carried out in the three years prior to the coming into force date is to be treated as though it were a test undertaken pursuant to regulation 12; and* *(b) within 6 months of the coming into force date, if an operator has complied with its obligations under these Regulations in full, that operator may continue to work with ionising radiation or commence work with ionising radiation, as the case may be, although the local authority has not prepared its off-site emergency plan as required by these Regulations, where the regulator, exceptionally, determines that it would be reasonable so to do.*
Guidance 28(1-3)	586 Employers who were working with ionising radiation under the 2001 Regulations prior to these Regulations coming into force may continue with existing arrangements whilst making plans to implement any additional measures or changes necessary to comply with these Regulations. The additional measures or changes should be brought into effect on or before the end of 21st May 2020. 587 Employers who were working with ionising radiation prior to these Regulations coming into force, but whose holdings of radioactive material were lower than the thresholds in the 2001 Regulations should check whether current holdings exceed the revised thresholds in Schedule 1 of these Regulations. If the current holdings exceed the thresholds in schedule 1, employers should bring into effect any measures necessary to comply with these Regulations by the end of 21st May 2020. 588 Employers working with ionising radiations for the first time will have to comply with these Regulations from the outset. 589 Where an employer has previously prepared a Hazard Identification and Risk Evaluation report under the 2001 Regulations, that report should be superseded by the Hazard Evaluation and Consequence Assessment, as described in regulations 4 and 5. The Hazard Evaluation and Consequence Assessment should be prepared and the consequence report sent to the local authority within four months of the Regulations coming into force. This provides the minimum 8 month period for the local authority to determine the detailed emergency planning zone (where relevant) and prepare an off-site emergency plan under regulation 11(4) prior to these Regulations coming into force. 590 Any changes to a detailed emergency planning zone as a consequence of the production of the Hazard Evaluation and Consequence Assessment should be made in line with the timescales set out in regulation 8. However through co-operative working, operators should inform the relevant local authority of any forthcoming likely changes to the reports as they are identified. Local Authorities can then consider if and what changes may be required to the detailed emergency planning zone or the off-site plan in advance of the changes being made. 591 Where an outline planning zone is required under these Regulations, this should be put into place on or before the end of 21st May 2020. 592 Any operator's emergency plan or off-site emergency plan that was in place previously under the 2001 Regulations should be reviewed and revised to ensure it is

	compliant with these Regulations by the end of 21st May 2020. 593 Any tests of emergency plans carried out within the three years prior to 22nd May 2019 can be considered to be in in accordance with regulation 12 of these Regulations. The following test should be held within three years of that test and in accordance with regulation 12, unless permission is sought from the regulator for an extended period (as per regulation 12(7)). 594 Where there is a requirement to change the prior information provided to the public (as per regulation 21), or the area in which information should be provided to comply with these Regulations, this should be done so by the end of 21st May 2020.

Regulation 29 Consequential amendments

Regulation 29	*Schedule 10 makes amendments consequential upon these Regulations.*

Regulation 30 Review

Regulation 30	*(1) The Secretary of State must from time to time—* *(a) carry out a review of the regulatory provisions contained in these Regulations, and* *(b) publish a report setting out the conclusions of the review.* *(2) The first report must be published before 22nd May 2024.* *(3) Subsequent reports must be published at intervals not exceeding 5 years.* *(4) Section 30(3) of the Small Business, Enterprise and Employment Act 2015([13]) requires that a review carried out under this regulation must, so far as is reasonable, have regard to how the obligations under articles 7, 15, 17, 32 to 34, 53, 69 to 71, 82 and 97 to 98 of Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom([14]) are implemented in other countries which are subject to the obligations.* *(5) Section 30(4) of the Small Business, Enterprise and Employment Act 2015 requires that a report published under this regulation must, in particular—* *(a) set out the objectives intended to be achieved by the regulatory provision referred to in paragraph (1)(a),* *(b) assess the extent to which those objectives are achieved,* *(c) assess whether those objectives remain appropriate, and* *(d) if those objectives remain appropriate, assess the extent to which they could be achieved in another way which involves less onerous regulatory provision.* *(6) In this regulation, "regulatory provision" has the same meaning as in sections 28 to*

([13]) 2015 c. 26. Section 30(3) was amended by section 19 of the Enterprise Act 2016 (c. 12).
([14]) OJ No L13, 17.1.2014, p 1.

	32 of the Small Business, Enterprise and Employment Act 2015 (see section 32 of that Act). Richard Harrington Minister for Business and Industry Date Department for Business, Energy and Industrial Strategy

Schedule 1	**Table of radionuclides & Quantity Ratios** **Table of radionuclides** **PART 1** Regulation 3(1)
Schedule 1 Part 1	[Table not included in draft code of Practice: it will be included in the final publication.]
Schedule 1 Part 1	595 The quantities of radionuclides are derived from a research project by PHE (see PHE report: 'Derivation of reference values for Schedule 1 of the REPPIR 2019 regulations. Specified quantities of inventory holdings for more than 700 radionuclides'. 2019 – to be published) [Ref XX]

Schedule 1	**Quantity ratios for more than one radionuclide** **PART 2** Regulation 3(1)
Schedule 1 Part 2	*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 Qp divided by the quantity of that radionuclide specified in the appropriate column of Part 1 of this Schedule Qlim, namely—* $\sum \frac{Q_p}{Q_{\lim}}$

Schedule 2	**Mass of Fissile Material** Regulation 3(1)
Schedule 2	*For the purpose of regulation 3(1), the specified mass of a fissile material are—* *(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; and* *(d) uranium enriched in U-235 to more than 5% - 250 grams.*
Guidance Schedule 2	582 The masses relate to the potential for criticality of the fissile material.

Schedule 3 Assessment of Consequences Requirements

Regulation 5(1)

Schedule 3 (1-2)	*1. The following requirements must be complied with in the assessment of consequences required by regulation 5.* *2. The assessment must be based on a suitable and sufficient range of source terms representing the range of potential emergencies which might arise from the work with ionising radiation.*
Guidance Schedule 3 (1-2)	596 When assessing the off-site consequences of potential radiation emergencies from their premises, operators need to estimate the likely public and worker exposures that may result from such events so that doses can be restricted and the need for emergency plans (regulations 10 and 11) be established. Assessments of this kind are highly complex and operators therefore should consult their RPA and, where appropriate, a radiological consequence assessment specialist. 597 As discussed in the guidance for Regulation 4(2) in complex cases the evaluation may lead to many source terms that for the purposes of practical analysis may be grouped together through the use of one or more representative but bounding source terms according to common characteristics such as similar initiating events, common facilities or equipment, or common consequences. The differing characteristics to be considered by the operator should also include different time frames associated with a release, and differing combinations and quantities of radionuclides involved. 598 For the purposes of evaluating potential off-site radiation doses to members of the public the operator should evaluate both the effective dose, and equivalent dose to the thyroid. The choice of methods for performing the atmospheric dispersion modelling is for the operator to justify. One methodology for performing such analysis has been proposed by PHE and adopts a probabilistic approach. An alternate approach using straight line Gaussian plume modelling is also possible as discussed in the guidance to Schedule 3(3) below. 599 [Additional paragraph required to describe and reference PHE look-up-table methodology – to be published shortly.]
Schedule 3 (3-6)	*3. The calculations undertaken in order to reach the assessment must consider a range of weather conditions (if weather conditions are capable of affecting the extent of the radiation emergency) to account for—* *(a) the likely consequences of such conditions; and* *(b) consequences which are less likely, but with greater impact.* *4. The assessment must consider the consequences of the radiation emergencies identified in regulation 4 on the population within the geographical extent of the potential radiation emergency, accounting for different characteristics, including, for*

	example age and other characteristics which would render specific members of the public especially vulnerable. *5. The assessment must consider what would be an effective and, where relevant, equivalent dose to the thyroid in the context of each radiation emergency identified.* *6. The assessment must include all relevant pathways by which members of the public could be exposed to radiation in the context of each radiation emergency identified.*
Guidance Schedule 3 (3-6)	**Considering a range of weather conditions** 600 PHE recommends a probabilistic assessment approach for atmospheric dispersion modelling based upon the application of historical weather data for the specific location of the premises. This enables consideration of a full range of weather conditions including those which are less likely and conditions which include precipitation. Alternatively, the operator may adopt a more deterministic approach using a straight-line Gaussian plume model and assessing the endpoints assuming Stability Category D5 with no precipitation (approximating to the likely consequences), and the most pessimistic endpoint from Stability Category D5 with precipitation and Stability Categories F2 and B2 with no precipitation (approximating to less likely consequences, but with a greater impact). [Ref PHE presentation 7/12/2018, material from which needs to be included in their methodology report] 601 The effect of considering precipitation during the release varies with exposure pathway and radionuclide. In general, pathways which primarily depend upon concentrations in air may exhibit lower doses in wet conditions than in dry, because of the influence of precipitation in lowering the concentrations in air due to enhanced deposition. Pathways which depend primarily upon deposition on the ground will tend to exhibit higher doses due to the potential for increased ground deposition occurring during precipitation. **Validation of calculational methods** 602 If new calculational methods and techniques are proposed to be used for the atmospheric dispersion modelling applied in the consequence assessment then the analyses will need to adequately represent the physical and chemical processes taking place. Where possible, the analytical models should be validated by comparison with actual experience, appropriate experiments or tests. The validation should be of the model as a whole or, where this is not practicable, on a module basis, against experiments that replicate as closely as possible the expected conditions. Care should be exercised in the interpretation of experiments to take account of uncertainties in replicating the range of test conditions. The limits of applicability of analytical models should be identified. Where validation against experiments or tests is not possible, a comparison with other, different, calculation methods may be acceptable. Where possible, independent checks using diverse methods or analytical models should be carried out to supplement the original analysis. **Consideration of the population within the geographical extent of the potential radiation emergency** 603 In order to inform emergency planning arrangements for all persons off-site likely to be exposed to radiation, the nature and magnitude of the risks to all persons

	off-site (including members of the public and emergency workers) should be assessed. 604 When considering the population as a whole, where relevant, it is generally sufficient to consider three age groups to represent the differing habits and dose assessment data for the range of ages that need to be planned for. These are infants aged 1 year, children aged 10 years, and young adults aged 20 years. Additionally, doses to the foetus and breast fed-infant should also be considered for those radionuclides where these could be potentially limiting. 605 For the purposes of evaluating potential off-site doses to off-site emergency workers the operator should consider the emergency arrangements that are likely to be required in an off-site emergency plan. Where an off-site emergency plan already exists, this will be a useful initial source of information. The operator, in consultation with the local authority, should identify potential duties, locations and durations of the actions of off-site emergency workers in order to provide realistic dose estimates. **Consideration of all relevant pathways** 606 Dose assessments should consider all relevant external and internal dose pathways, including inhalation, resuspension, ground gamma, ingestion (including commercial and domestic leafy green vegetables and milk), and cloud dose. This will include assessment of any releases of radioactive material to air or inland watercourses and also doses from direct radiation. 607 Consideration should also be given both to the likely duration of potential releases or external exposure scenarios and the period within which they are most likely to commence.
Schedule 3 (7-8)	*7. The assessment must identify any protective action that may need to be taken for the range of potential radiation emergencies.* *8. The assessment must assess the consequences of suitable and sufficient source terms by distance and by exposure pathway, and the distances to which protective action would be required based on the United Kingdom Emergency Reference Levels, published by Public Health England (b). [(b) Footnote for location of PHE ERLs]*
ACOP Schedule 3 (7-8)	**Assumptions for the radiological consequence assessment** **608 The consequence assessment performed in accordance with Schedule 3 should identify the range of potential consequences for:** **a) the short-term (two days following the start of the release), and;** **b) the long-term (in the twelve months following the radiation emergency).** **609 The short term consequence assessment should be used to determine:** **a) the distance at which relevant ERLs would suggest that urgent protective actions are required for persons off-site, and;** **b) the effective dose for emergency workers for comparison against the relevant reference level.**

610 The long term consequence assessment should be used to identify:

a) the recommended extent of the geographical area upon which the local authority will determine the detailed emergency planning zone, and;

b) the effective dose to members of the public off-site for comparison against the relevant reference level in order to inform emergency planning.

Operator's recommendation of the minimum geographical extent for the detailed emergency planning zone

611 For each representative source term that lies within the 'detailed emergency planning required' region of the REPPIR risk framework (Appendix 2, Figure 2) the distance to where the potential dose saving (averted dose) from all relevant exposure pathways becomes equal to the lower ERL following implementation of the relevant urgent protective action, should be identified. These calculations should consider the most vulnerable member of the public off-site and should assume conservative weather conditions.

612 In calculating averted dose two calculations are required. Firstly it should be assumed that the exposed individuals are subject to no protective measures and are outside during the entire exposure period (with no protection afforded from being inside a building). The second calculation is for the dose with the relevant protective action in place. The dose averted by this protective action is the difference between the two values.

613 The largest distance identified from these assessments should be selected as a candidate for the recommended geographical extent for the detailed emergency planning zone.

Determination of the distances for urgent protective actions

614 The dose criteria upon which the operator's assessment identifies distances for consideration by the local authority for the introduction of appropriate urgent protective action (sheltering, and where appropriate, evacuation and stable iodine) should be that corresponding to the lower ERLs. The calculation of averted dose should be according to paragraph 612.

615 In order to inform local authority planning for the implementation of urgent protective actions, the operator should also evaluate the distances where the upper ERLs may be applicable. Important factors such as the timescales within which protective action should be planned to be carried out should also be identified.

Assessment of total residual effective doses for members of the public

616 The assessment of the geographical extent of the consequences of a radiation emergency should consider effective doses and, where relevant, equivalent doses, to members of the public from the boundaries of the premises out to a distance equivalent to 1 mSv effective dose in the first twelve months following an emergency. Urgent protective action should be assumed to have been implemented.

617 Ingestion doses should be based on the location of commercial food production from the vicinity of the site out to the distance at which food restrictions, if in place, would apply. After 24 hours, food restrictions should be assumed to be applied at the levels corresponding to the EU Maximum Permitted Levels in food currently applicable to the UK.

Guidance Schedule 3 (7-8)	**Principles for recommending the minimal extent of the detailed emergency planning zone** 618 The ACOP for Schedule 3(7-8) defines a general method for the operator to recommend the minimum geographical extent of the detailed emergency planning zone. 619 In practice, with the possible exception of operating reactors where use of stable iodine tablets may be a dominant factor, the operator's initial candidate recommendation of the minimum geographical extent of the detailed emergency planning zone (km) is likely to be based upon the lower ERL for sheltering. ERLs are a measure of averted dose and the geographical extent of the detailed emergency planning zone is usually a radial distance in kilometres (km). PHE's analysis[#6] of the effect of sheltering on inhalation exposures shows a typical dose reduction factor (DRF) of approximately 0.6 (derived on the basis of a combination of modelling and literature review). This value assumes an inhalation dose to an individual sheltering during the entire passage of the plume, until both the indoor and outdoor air concentrations fall back down to zero (or close to it), with no opening of windows and doors to the external environment. Under such circumstances the DRF remains constant irrespective of the release duration. [#6 PHE publication 2019 reference]. The fraction of the dose that is averted is therefore 1 – DRF = 0.4 which implies that the distance where the lower ERL for sheltering of 3 mSv is at the distance where the outdoor effective dose is 7.5 mSv. (I.e.3 mSv divided by 0.4.) For premises where inhalation is the dominant exposure pathway (other than operating reactors), this outdoor effective dose can be used as a surrogate for identifying the initial candidate minimum geographical extent for the detailed emergency planning zone. 620 For premises where pathways other than inhalation are significant, such as direct irradiation, criticality, iodine inhalation or radionuclides that contribute significantly to external doses, these doses will also impact the method of assessing the initial candidate minimum geographical extent for the detailed emergency planning zone. 621 Once the technical assessment described in the paragraphs above is complete, the operator may wish to exercise judgement to increase the initial candidate minimum geographical extent calculated by taking into account practical protective actions that may still be relevant at doses below 7. 5 mSv, relevant international IAEA standards and guidance, and the need to optimise protection strategies, including consideration of the serious consequences that define a radiation emergency. Once these have been considered, the operator is able to recommend the minimum geographical extent for the detailed emergency planning zone. 622 The operators recommendation of the minimum geographical extent for the detailed emergency planning zone should usually be a circular radial distance (km) with the centre point clearly indicated. For premises with multiple facilities located around a site and potentially a number of centre points, the operator may describe one overall extent that encompasses all facilities, or separate extents that relate to each relevant facility. **Principles for recommending the geographical extent for the outline planning zone** 623 Operators responsible for recommending the geographical extent for an outline planning zone under regulation 9(1)(b), or civil nuclear operators proposing a change to the default planning zone specified in Schedule 5 under regulation 9(2), should perform the calculation in the paragraphs above for determining the detailed emergency planning zone. However, this may be performed on a best estimate basis; the upper ERL may be considered more appropriate, best estimate weather conditions may be assumed, and consideration for the timescales of the release may be taken into account when selecting the source term to be used in the calculation. 624 For each representative source term that lies within the 'outline emergency planning required' region of the REPPIR risk framework (Appendix 2, Figure 2), the

	distances to where the potential dose saving (averted dose) from the relevant exposure pathways becomes equal to the upper and lower ERL following implementation of the relevant urgent protective action, should be identified. 625 Once the technical assessment described above is complete, the operator should consider relevant international IAEA standards and guidance, and the need to optimise protection strategies, including consideration of the serious consequences that define a radiation emergency. The operator is then able to recommend the geographical extent of the outline planning zone.
Schedule 3 (9)	*9. In this Schedule "source term" means the radioactivity which could give rise to direct external exposures from the premises or which could be released to the environment in a radiation emergency and, for releases, includes—* *(a) the amount of radionuclide released;* *(b) the time distribution of the release;* *(c) the energy associated with atmospheric release; and* *(d) the likely chemical and physical form of the radionuclides in the release.*
Guidance Schedule 3 (9)	626 (a) For each identified radiation emergency this will be the quantity of radioactive substances which is released to atmosphere. (b) The time distribution should include the likely time lapse before the release is likely to commence, the rate at which it occurs, and its likely maximum duration. (c) The energy associated with atmospheric release. It is related to the energy associated with the buoyancy and momentum of the plume at the point it is released into the atmosphere. For example, heat and pressure may provide for releases to be lofted and propelled respectively into the atmosphere. (d) Where relevant, this should include information on particle size and whether the radionuclides are likely to be organically bound (for example whether isotopes of iodine are likely to be in particulate, elemental vapour or organic form).

Schedule 4	**Particulars to be included in a consequences report** Regulation 7(5)
Schedule 4 Parts 1-3	***PART 1*** ***Factual Information*** *1. The following factual information must be provided in the operator's consequences report—* *(a) the name and address of the operator;* *(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;* *(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.* ***PART 2*** ***Recommendations***

	2. The operator must include the following recommendations in the consequences report— *(a) the proposed minimum geographical extent, if any; and* *(b) the minimum distances to which urgent protective action may need to be taken, marking against each distance the timescale for implementation of the relevant action.* *3. Where a minimum geographical extent is recommended under paragraph 2, the operator must also include within the consequences report—* *(a) the recommended urgent protective action to be taken within that zone, if any, together with timescales for the implementation of that action; and* *(b) details of the environmental pathways at risk, in order to support the determination of food and water restrictions in the event of a radiation emergency.* ***PART 3*** ***Rationale*** *4. The operator must set out the rationale supporting each recommendation made in the consequences report.* *5. In particular, the operator must set out—* *(a) the rationale for its recommendation on the minimum distances for which urgent protective action may need to be taken; and* *(b) where the operator and local authority have agreed that no off-site planning is required, and therefore no emergency planning is recommended, the rationale for that agreement.*
Guidance Schedule 4 Parts 1-3	627 The consequence report should contain all the information required in Schedule 4. The reports submitted should contain sufficient information and, where appropriate, cross references, for the relevant regulator to be able to confirm the conclusions reached. The documentation should also have been subject to appropriate document control procedures before issue. As noted in the guidance for Regulation 4(5), where the requirements complied with under the 2017 Regulations or NIA satisfy equivalent requirements under REPPIR it will not be necessary to duplicate information. Instead the relevant documents may be cross referenced within the consequence report.

Schedule 5 Determination of Outline Planning Zone

Regulation 9(1)(a)

Schedule 5

1. The following table applies for the purpose of setting the outline planning zone under regulation 9(1)(a).

Category	*Nature of site*	*Outline planning zone*
1	*Sites involved in the processing of High Level Waste or storing in excess of 100 tonnes of Plutonium*	*50 kilometres*
2	*Operating nuclear power plants and decommissioning nuclear power plants*	*30 kilometres*

		with a presence of irradiated fuels	
	3	*Sites with a significant presence of enriched uranium and decommissioning nuclear sites (other than power plants) with a significant presence of irradiated fuels*	*5 kilometres*
	4	*Decommissioned sites without a significant presence of irradiated fuels*	*1 kilometre*
	5	*Sites involved in the production of radiopharmaceuticals*	*No outline planning zone*

2. In the Table at paragraph 1 "High Level Waste" means waste which is radioactive enough for the heat released as a result of radioactive decay to increase significantly its temperature and the temperature of its surroundings and includes—

(a) the liquid residue that contains most of the radioactivity from the reprocessing of spent nuclear fuel;

(b) this residue once it has solidified; or

(c) any other waste with similar radiological characteristics.

Guidance Schedule 5

628 The outline planning zone distances are a radius from a clearly indicated centre point.

629 If the nature of the site is not described in Schedule 5 but the site is a civil nuclear site identified under regulation 9(1)(a), no default outline planning zone is required under this Schedule, but may still be proposed by the operator (see paragraph 202). Such sites include metal recycling facilities, decommissioning sites that are in care and maintenance, decommissioning research reactors and sites only handling low level radioactive waste.

630 Any civil nuclear site to which these Regulations do not apply, do not require a default outline planning zone.

Category 1 sites

631 Category 1 sites are those sites involved in the processing or storage of significant quantities of high level waste and/or storing significant quantities of plutonium.

Category 2 and category 4 sites

632 Sites in category 2 are operating nuclear power plants and decommissioning nuclear power plants with a presence of irradiated fuels.

633 Once a power plant has verified that it is fuel free, it does not have a significant amount of irradiated fuel and can propose to the regulator and the Secretary of State that it move from category 2 to category 4 of Schedule 5 as per 9(2). Evidence of fuel free verification should form the basis of a written justification supporting such a proposal.

Category 3 sites

634 Category 3 sites are sites with a significant presence of enriched uranium or irradiated fuel and include those sites handling or storing bulk quantities of these materials. Category 3 sites do not include power plants.

Category 5 sites

	635 These sites are or have been involved in the production of radiopharmaceuticals. Radiopharmaceuticals are radioisotopes bound to biological molecules able to target specific organs, tissues or cells within the human body. Category 5 sites include decommissioning and decommissioned radiopharmaceutical sites. Although no default outline planning zone is required under this Schedule, one may still be proposed by the operator (see paragraph 202).

Schedule 6	**Information to be included in Emergency Plans** **Regulations 10(3) and 11(3)**
Schedule 6 Part 1	**Part 1** **Information to be included in an Operator's Emergency Plan**
Guidance Schedule 6 Part 1	636 This Part lists the minimum information to be included in the operator's emergency plan.
Schedule 6 Part 1 (1)(a)(b)	*(1) The information referred to in regulation 10(3) is as follows—* *(a) the arrangements to set emergency procedures in motion;* (b) *the arrangements to co-ordinate the on-site mitigatory action;*
Guidance Part 1 (1)(a)(b)	637 The plan should include the premises command structure for managing the on-site response in accordance with the operator's emergency response arrangements. The plan should describe the activation process, including any declaration state definitions, and identify who has the authority for declaration of a radiation emergency (see regulation 17 on implementation of emergency plans). The arrangements should cover circumstances when senior managers are not available. It is recommended that the names or positions and roles, are included in the annexes of emergency plans, given that re-issue of an annex may be less burdensome than re-issue of the whole plan. Contact details should also be available but could be included in a supporting document to the plan.
Schedule 6 Part 1 (1)(c)	*(c) the name or position of the person with responsibility for liaison with the local authority responsible for preparing the off-site emergency plan;*
Guidance Part 1 (1)(c)	638 This is normally the person or position with responsibility for maintaining the operator's emergency plan. It is recommended that the names or positions and roles of authorised personnel are included in the annexes of emergency plans, given that re-issue of an annex may be less burdensome than re-issue of the whole plan. Contact details should also be available but could be included in a supporting document to the plan.
Schedule 6 Part 1 (1)(d)	*(d) for 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 resources available;*
Guidance Part 1 (1)(d)	639 This is the principal component of the operator's emergency plan and must be drawn up in accordance with the principles and purposes of emergency plans set out in Schedule 7. The plan should cover the range of potential radiation emergencies and the degree of planning should be proportionate to the consequences and likelihood of an event occurring. 640 The plan should include: (a) identification of a range and grouping of events with the potential to cause a radiation emergency as identified by regulations 4 and 5; (b) the potential consequences of these events and the impact of any variable factors on the severity of the consequences (see regulation 10(2));

	(c) the intended strategy for dealing with these events should they come about, including any relevant planning assumptions which have been made ; (d) details of any supporting procedures and documents in place to support the on-site emergency plan; (e) details of the personnel who have roles to play in the emergency response, and their responsibilities; (f) details of the facilities and communications equipment available to support the emergency response; (g) details of the availability and function of special emergency equipment including fire-fighting materials, and damage control and repair items; and (h) details of the availability and function of other resources. 641 See guidance to regulations 10(6), 10(7) and 10(8) for further guidance on the provision of information, instruction, training and equipment.
Schedule 6 Part 1 (1)(e)	*(e) the arrangements for limiting the risks to persons on the premises including how warnings are to be given and the protective action persons are expected to take on receipt of a warning;*
Guidance Part 1 (1)(e)	642 This should include the systems, equipment and facilities for early detection of a developing radiation emergency, the means of warning people working on the site and the responsibilities for initiating the suitable responses by the operator's personnel (e.g. to evacuate via planned evacuation routes, shelter, muster at planned muster points, use personal protective equipment, take stable iodine etc.). The action to be taken should be planned in accordance with the principles and purposes of emergency plans set out in Schedule 7. 643 This should also include the arrangements to secure, so far as is reasonably practicable, the restriction of exposure to ionising radiation and the health and safety of personnel who have a role in responding to the emergency. 644 Regulations 10(6),10(7) and 10(8) require the provision of information, instruction, training and equipment. This should ensure that persons on the premises are sufficiently informed in advance of the action they should take and have access to the equipment necessary to restrict their exposure.
Schedule 6 Part 1 (1)(f)	*(f) the arrangements for providing early warning of the incident to the responder or responders identified in the local authority's off-site emergency plan to set the off-site emergency planning 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;*
Guidance Part 1 (1)(f)	645 The operator's emergency plan should establish the system for managing information in the event of a radiation emergency or an event which is likely to lead to a radiation emergency. This should ensure that necessary information can be identified and communicated to people on-site, the local authority, the emergency services and other organisations identified in the plan as having a role to play and requiring information. 646 This should include: (a) the operator's arrangements for alerting responding organisations (which by local

	agreement may be by an external body such as the police service) and when this should be done (see guidance xxx), including the arrangements for obtaining assistance from off-site organisations if required. The operator should aim for initial notification to take place within 15 minutes of the declaration of the radiation emergency but in any case as soon as possible; and (b) the type of information that the local authority and off-site organisations will require, before and during their response, in what form, to whom and by whom. For example information on the nature and extent of the radiological hazard will be required by off-site organisations to inform decisions on the off-site response, including whether a response should be triggered within the outline planning zone, where one exists. The initial notification could be made using a standard, pre-agreed format. 647 For radiation emergencies based on perceived risk, the plan should include the communication arrangements necessary to provide reassurance to the public and manage local concerns. This should include details of the operator's own communications response and the arrangements for providing information to the local authority and off-site organisations so that they can provide consistent communications.
Schedule 6 Part 1 (1)(g)	*(g) the arrangements for providing assistance to the local authority with its off-site protective action;*
Guidance Part 1 (1)(g)	648 This should include, for example, details of: (a) any special equipment, expertise or facilities which have been identified for use as part of the off-site emergency plan, for example to assist with off-site monitoring; and (b) the role of the establishment's personnel in briefing the media, including the use of media briefing facilities.
Schedule 6 Part 1 (1)(h)	*(h) the arrangements for providing information about the incident to the Secretary of State and the regulator;*
Guidance Part 1 (1)(h)	649 This should include the operator's arrangements (including who, what, how and when) for alerting the Secretary of State and the regulator and for providing updates during the response.
Schedule 6 Part 1 (1)(i)	*(i) the arrangements for providing information about the incident to the Scottish Government or the Welsh Ministers, if appropriate;*
Guidance Part 1 (1)(i)	650 This should include the operator's arrangements (including who, what, how and when) for alerting the Scottish Government or Welsh Ministers if appropriate and for providing updates during the response.
Schedule 6 Part 1 (1)(j)	*(j) the arrangements for dealing with emergency exposures including the dose levels which have been determined as appropriate for the purposes of putting into effect the emergency plan;*
Guidance Part 1	651 This should include: (a) the liaison arrangements with other employers (for example other employers

(1)(j)	on-site and emergency services) to reach agreement with the operator on the dose level(s) for the purposes of undertaking on-site protective action (including mitigatory action); (b) the different emergency exposure dose levels that may be required relevant to the radiation emergencies that may occur; and (c) the arrangements for managing emergency exposures during a radiation emergency to ensure compliance with the requirements of regulation 18(1).
Schedule 6 Part 1 (1)(k)	*(k) the arrangements to prioritise keeping doses within the levels set out in regulation 20(1);*
Guidance Part 1 (1)(k)	652 The plan should record the arrangements and the reference levels referred to in regulation 20(2).
Schedule 6 Part 1 (1)(l)	*(l) any specific arrangements which take account of lessons learned from past emergency situations, whether at the operator's premises or otherwise;*
Guidance Part 1 (1)(l)	653 When preparing the operator's emergency plan the operator should consider and apply where appropriate: (a) lessons from past emergency situations and incidents, whether at the operator's premises or otherwise, including any relevant learning from non-radiation emergency situations and international emergencies; (b) lessons from emergency exercises, whether at the operator's premises or otherwise, and at a national and international level; and (c) current knowledge or guidance concerning the response to emergencies, for example national or international best practice. 654 The operator's emergency plan should evolve as lessons are identified by taking them into account in the review of the emergency plan under regulation 12. Further guidance is available under regulation 12.
Schedule 6 Part 1 (1)(m)	*(m) what protective action is proposed to be taken, and how far each such action extends within any detailed emergency planning zone; and*
Guidance Part 1 (1)(m)	655 The operator's emergency plan should cover protective action for persons on-site (see Schedule 6, Part 1 (e)). To ensure that both emergency plans dovetail, the operator's emergency plan should also refer to the same initial urgent protective action as the off-site emergency plan (e.g. sheltering, evacuation, stable iodine) (see Schedule 6, Part 2, Chapter 1 (f)). The operator's emergency plan should include details of the types of information that will be required to inform the decisions in the off-site response on further protective action to be taken (see Schedule 6, Part 1 (f)).
Schedule 6 Part 1 (1)(n)(o)	*(n) the arrangements which the operator considers may assist in the transition from a radiation emergency to an existing exposure situation, including who will be involved in such transition , what information they are to receive ,and when.*
Guidance Part 1	656 These Regulations do not apply to existing exposure situations (see paragraph 3 for guidance on 'existing exposure situation' which is referred to as 'the recovery phase'

(1)(n)	below). Existing exposure situations are covered by the Radioactive Contaminated Land regime and other legislation, such as the Environmental Permitting Regulations in England and Wales and the Environmental Authorisations (Scotland) Regulations 2018 in Scotland for the management of radioactive wastes arising. However, under these Regulations arrangements must be made to assist in transitioning effectively to the recovery phase. 657 Decisions made in the response phase may impact the ability to deliver recovery successfully, so the recovery phase should begin at the earliest opportunity following the onset of an emergency, running alongside the response to the emergency. The process is transitional as some aspects of the response may progress to recovery sooner than others. Off-site, the handover of coordination from the response phase to the recovery phase should take place when pre-agreed criteria have been met. The operator should provide the necessary information to help off-site organisations determine whether such criteria have been met. 658 The arrangements should include: (a) the types of information required to inform the decision of whether the off-site handover of coordination from the response phase to the recovery phase can take place (for example information on whether the emergency has been brought under control and is stable, confirmation that the source of exposure is sufficiently characterised, radiological monitoring data etc.); (b) any other information which will assist the transition and which is required by off-site organisations to inform decisions; and (c) for the above points, identification of who should receive such information (this would usually be the local authority) and how it will be effectively communicated to them. 659 The IAEA General Safety Guide No. GSG-11 sets out further guidance on arrangements for terminating a radiation emergency.
Schedule 6 Part 2	**Part 2** **Information to be included in the off-site emergency plan**
Guidance Schedule 6 Part 2	670 This Part lists the minimum information to be included in the off-site emergency plan. 671 The off-site emergency plan is an integrated emergency management plan that brings together the emergency arrangements of all the off-site organisations with a role in the response to a radiation emergency. It should provide a framework for the management, coordination and control of the off-site response within which responding organisations can work effectively together to mitigate the consequences of a radiation emergency so far as is reasonably practicable. 672 Protective action that would be taken by the operator to prevent radiation emergencies or to limit their consequences can be reflected in the degree of planning that is undertaken. The planning should be proportionate to the consequences and likelihood of an event occurring and may also take into account existing arrangements. 673 The off-site emergency plan should provide supporting information to assist the response. This includes relevant information about population demographics (e.g. locations and sizes of schools, hospitals, care homes, vulnerable groups), identification of critical infrastructure (e.g. transportation links, utilities, communications) and an assessment of where regional (e.g. a neighbouring local authority) or national support would be needed and how that could be requested.

674 The local authority's own emergency response arrangements, dealing with the welfare of the population in the vicinity of the premises (including, for example, the provision of food and shelter), will be one of the detailed documents underpinning the off-site emergency plan.

675 The local authority's off-site emergency plan needs to be effective in all situations and should allow for the provision of possible reductions in staffing levels or closure of facilities during weekends, public holidays etc. This is to ensure the plan considers and plans for those situations when routine staffing levels may not be available.

Detailed and Outline Planning

676 Off-site emergency planning should be undertaken as follows:

(a) where there is a detailed emergency planning zone this is the area within which planning should incorporate the strategic, tactical and operational arrangements necessary to implement required protective action without undue delay based on pre-defined conditional criteria. Detailed emergency planning aims to implement urgent protective action within a few hours to mitigate the potential impact of radiation emergencies. Urgent protective action will provide time for responders to understand the consequences of the incident and to adjust subsequent protective action, such as increasing the scale of action taken and focusing those on areas at actual risk;

(b) where there is an outline planning zone this is the area within which strategic level, outline planning should be undertaken to support the decision making of emergency responders in the event that detailed planning (where this exists) or generic arrangements are not sufficient to respond to low probability events up to and including unforeseen events. Outline planning is about identifying where capabilities could be obtained from and how decisions on protective action would be made. It does not aim to implement protective action immediately, although there still should be a timely response, and is proportionately less detailed and less onerous than detailed planning; and

(c) outline planning will generally happen within the outline planning zone and detailed planning will happen within the detailed emergency planning zone. Nonetheless, there may be pockets of detailed planning inside the outline planning zone where local circumstances make it proportionate to put these in place (see paragraph 678 below for further guidance). Outline planning may also be undertaken within the detailed emergency planning zone where protective action may not be required in that area, except in the event of more severe radiation emergencies.

677 Prior information requirements also differ between the detailed emergency planning zone and the outline planning zone. See regulation 21 for further guidance.

678 The table below summarises the distinctions between detailed and outline planning.

	Outcome	**How planning functions**
Detailed Planning	Ensures response capabilities (and the necessary action that underpin them): • can be implemented at speed; • can be implemented automatically or with little (emergency-phase) decision-making processes; and • will be (near) guaranteed.	Achieves these outcomes by describing the: • generation; • deployment; • management; and • sustainment of emergency response capabilities/action.

			Response capabilities and their supporting action are pre-agreed between local planners in advance.
	Outline Planning	Lays the foundation for additional response capabilities/action that should: • be available in longer time, after the emergency is declared in most cases; • only be implemented when (emergency-phase) deliberation considers them necessary; and • only be available on a reasonable endeavours basis.	Achieves these outcomes by describing the: • decision points; • escalation routes; and • crucial information/ intelligence sources that allow the expansion of these response capabilities/ action. Written plans set out what responders will do in broad terms, and will utilise and build on the knowledge and learning derived from any assessments of the extendibility of plans.

Schedule 6 Part 2 Chapter 1 (2)(a)(b)	***CHAPTER 1*** ***Information about detailed emergency planning zones*** *(2) The information referred to in regulation 11(3)(a) is as follows—* *(a) the arrangements to set emergency procedures in motion;* *(b) the arrangements to co-ordinate the off-site protective action;*
Guidance Part 2 Chapter 1 (2)(a)(b)	679 This should include the management structure for organising and managing the off-site response in the event of a radiation emergency. The responding organisations should strive to work together as a team to maximise the effectiveness of the response to an emergency, and the response should be co-ordinated and have common basic objectives. 680 The plan should describe the activation process and the agreed multi-organisation coordination arrangements for the off-site emergency response. 681 There will be times when the senior managers are not available and appropriate arrangements should be included for these circumstances. It is recommended that the names or positions and roles of authorised personnel are included in the annexes of emergency plans, given that re-issue of an annex may be less burdensome than re-issue of the whole plan. Contact details should also be available but could be included in a supporting document to the plan.
Schedule 6 Part 2 Chapter 1 (2)(c)	*(c) the arrangements for receiving early warning of incidents, and alert and call-out procedures;*
Guidance Part 2 Chapter 1 (2)(c)	682 The off-site emergency plan should include details of: (a) how a warning of a developing or actual radiation emergency will be received by the local authority and off-site emergency services. For further guidance on communications between the operator, local authority and other responding organisations see the guidance to regulation 13(1)(b) and (c); and

	(b) how the warning will be cascaded, as necessary, to the other off-site organisations involved, or likely to be involved, in the response to a radiation emergency (see guidance paragraphs xxx and xxx on regulation 17).
Schedule 6 Part 2 Chapter 1 (2)(d)	*(d) the arrangements for co-ordinating resources necessary to implement the off-site emergency plan;*
Guidance Part 2 Chapter 1 (2)(d)	683 Detailed planning should describe the activation, deployment, management and sustainment of specific emergency response capabilities needed to provide a response at any time, without delay. Within the detailed emergency planning zone it may be necessary to pre-deploy equipment, people, and other resources, as part of developing the emergency plan to ensure that the detailed emergency response can be swiftly enacted at any time of day in the event of an emergency. Planning should draw upon national emergency planning where appropriate to ensure that the response can be sustained and that any additional national resources needed to manage the consequences of the emergency are quickly brought into play. 684 Information should be included in the off-site emergency plan on how and on what timeframe the resources identified in the response arrangements will be mobilised and how the action of the off-site organisations will be co-ordinated; this information should complement and support the information required in the previous parts. The information should include: (a) which organisations have a role to play in the emergency response, and their roles and responsibilities; (b) how each organisation will be alerted and will put their emergency arrangements into action; (c) how responders from the premises and the emergency services will recognise each other at the scene; (d) how responders from the responding organisations and premises will communicate to obtain and transmit information needed for decision making, in accordance with their agreed roles and responsibilities, including details of the facilities and communications equipment available to support the emergency response; (e) the location where the emergency services, responders from the premises and other relevant organisations will rendezvous off-site, if necessary; and (f) how responders from the responding organisations will gain access to the premises, to any special equipment or to any other resources which may be required in the response.
Schedule 6 Part 2 Chapter 1 (2)(e)	*(e) the arrangements for providing assistance to the operator with on-site mitigatory action;*
Guidance Part 2 Chapter 1 (2)(e)	685 Emergency workers who may be involved with the operator's emergency plan must also be provided with information, instruction, training and equipment under regulation 10(7) and 10(8) which will include those off-site organisations providing assistance to the operator with on-site mitigatory action. 686 The off-site emergency plan should include details of: (a) the type of events identified with the potential to cause a radiation emergency; (b) the intended strategy for dealing with these events on the premises should they come about; (c) details of the personnel/organisations who have roles to play in the on-site response, and their responsibilities;

	(d) arrangements for briefing responding personnel arriving at the premises; (e) details of the availability and function of special equipment including fire-fighting materials, damage control and repair items; and (f) details of the availability and function of other resources.
Schedule 6 Part 2 Chapter 1 (2)(f)	*(f) the arrangements for off-site protective action;*
Guidance Part 2 Chapter 1 (2)(f)	687 These arrangements are about mitigating the off-site effects of radiation emergencies and should be developed on the basis of the content of the consequences report (see regulation 7). 688 Off-site protective action should, as appropriate, include, for example: (a) sheltering members of the public; (b) evacuating members of the public; (c) administering stable iodine tablets to members of the public; (d) preventing people entering the affected area; (e) controlling traffic (including road, rail, marine and aviation) to minimise unnecessary contamination of cargo and vehicles and control movement, for example maintaining essential emergency services' routes; (f) food, feed and water restrictions; (g) protection of property, for example closing ventilation to minimise contamination of outdoor spaces, goods etc.; and (h) any other action concerning protection of the public, for example restrictions on outdoor activities. 689 For (a) to (d), the off-site emergency plan should set down the conditions under which urgent protective action should be considered to ensure that they are enacted promptly when needed and how they will be implemented. Protection strategies require a balance to be struck between the expected benefits and detriments of introducing particular protective action so that the margin of benefit over detriment is maximised. ERLs are recommended by PHE for planning emergency urgent protective action (sheltering, evacuation and stable iodine). ERLs consider the balance between the benefit from reducing the dose against the other consequences of implementing urgent protective action (i.e. wider health risks (including psychological impact); consequential injuries; economic consequences; social and environmental factors). PHE's document on Advice for Public Health Protection in the Event of Radiation Emergencies provides further guidance on protective action and ERLs. 690 Actions (e) to (h) may not be considered for immediate implementation but consideration should be given at the planning stage of whether such action may be required in a radiation emergency, how the decision would be made to implement them and how this would be achieved. The decision of whether to take action would need to consider the overall potential benefit of the action proposed together with the possible detriment associated with them. Similarly, such action may impact on other, potentially much more beneficial, urgent protective action and reduction in their benefit should be avoided. 691 The principles and purposes of emergency plans (see Schedule 7) must be taken into account when planning off-site mitigatory action.
Schedule 6 Part 2 Chapter 1	*(g) the arrangements for providing the public with specific information relating to the emergency and the response or responses recommended to the public as a whole or parts of it as a result of the emergency;*

(2)(g)	
Guidance Part 2 Chapter 1 (2)(g)	692 The off-site emergency plan should include information on: (a) how the public in the vicinity of the premises will be alerted in the event of a radiation emergency; (b) how they will be informed of what they should do; and (c) how they will be informed that the danger is passed and they may return to their normal activities. 693 This will refer to the prior information that will have been supplied to members of the public in the detailed emergency planning zone (see regulation 21) and the supply of information to the public in the event of a radiation emergency (see regulation 22). The methods available to deliver urgent information to members of the public are varied and some may depend on the availability of power supplies or telephone lines so a variety of channels should be available. The public may be warned by an audible alarm or siren where available, telephone or some other system; the methods and arrangements for warning and informing the public should be recorded in the emergency plan. 694 The prior information should inform the public in the vicinity of the premises about the warning mechanism, for example the meanings of different alarms and sirens. It should be noted that prior warning is not always possible. 695 For radiation emergencies based on perceived risk, the plan should include the communication arrangements necessary to provide reassurance to the public and manage local concerns. This should include details of how the local authority will receive information from the operator on the situation and the arrangements for the local authority and off-site organisations to provide consistent communications to the public.
Schedule 6 Part 2 Chapter 1 (2)(h)	*(h) the arrangements for dealing with emergency exposures including the dose levels which have been determined as appropriate for the purposes of putting into effect the emergency plan;*
Guidance Part 2 Chapter 1 (2)(h)	696 This should include: (a) the liaison arrangements with other employers (for example, emergency services) to reach agreement with the operator on the dose level(s) for the purposes of undertaking off-site protective action; (b) the different emergency exposure dose levels that may be required relevant to the radiation emergencies that may occur; and (c) the arrangements for managing emergency exposures during a radiation emergency to ensure compliance with the requirements of regulation 18(1).
Schedule 6 Part 2 Chapter 1 (2)(i)(j)	*(i) the arrangements to prioritise keeping doses within the levels set out at regulation 20(1);*
Guidance Part 2 Chapter 1 (2)(i)	697 The plan should record the arrangements and the reference levels referred to in regulation 20(2).
Schedule 6 Part 2 Chapter 1 (2)(j)	*(j) any specific arrangements which take account of lessons learned from past emergency situations, whether at the operator's premises or otherwise;*
Guidance Part 2 Chapter 1	698 When preparing the off-site emergency plan the local authority should consider and apply where appropriate:

(2)(j)	(a) lessons from past emergency situations and incidents, whether at the premises covered by the off-site emergency plan or otherwise, including any relevant learning from non-radiation emergency situations and international emergencies; (b) lessons from emergency exercises whether at the premises covered by the off-site emergency plan, or otherwise, and at a national and international level; and (c) current knowledge or guidance concerning the response to emergencies, for example national or international best practice. 699 The off-site emergency plan should evolve as lessons are identified by taking them into account in the review of the emergency plan under regulation 12. Further guidance is available under regulation 12.
Schedule 6 Part 2 Chapter 1 (2)(k)	*(k) the arrangements for carrying out an assessment of the impacts of the radiation; and*
Guidance Part 2 Chapter 1 (2)(k)	700 The off-site emergency plan should include information on the arrangements for determining the nature and impact of the radiological hazard. This is necessary to ensure that the plan is capable of responding to the particular characteristics of a radiation emergency as those characteristics emerge. There are wider impacts associated with radiation emergencies, for example psychological impact, which should be considered as part of protection strategies (see Schedule 7, Part 1). The purpose of the assessment of the radiological hazard is: (a) to inform activities associated with the immediate safety of people, including decisions on urgent protection action and provision of public reassurance; (b) to establish environmental impact; and (c) to determine food restrictions if required. 701 Environmental monitoring should be conducted to quickly confirm any release of radiation and then to subsequently determine the nature and extent of any contamination. Automated radiation detection systems may be in place in and around the site and can provide immediate indications of abnormal radiation levels. These form part of the Government's National Response Plan for dealing with overseas nuclear accidents and can also be used to support the response to radiation emergencies by providing the facilities necessary to assemble, analyse and interpret the various forms of radiological monitoring data that would be needed to establish the effects of such an emergency in the UK. Ground based sampling activities can identify the geographical spread of radiation. 702 Arrangements may include establishing a public health monitoring facility (Radiation Monitoring Units) to monitor members of the public who have been evacuated or to provide reassurance to people who may have been in close proximity to the site. 703 The arrangements should include details of how information will be shared promptly, consistently and accurately between organisations and details of how data will be interpreted so that assessments can utilise cross-organisation collaboration in order to synthesise the wide range of available expertise, roles and information sources to produce consolidated and informed judgements.
Schedule 6 Part 2 Chapter 1 (2)(l)	*(l) the arrangements which the local authority considers necessary in the transition from a radiation emergency to an existing exposure situation, including who will be involved in such a transition and what information they are to receive.*
Guidance Part 2 Chapter 1	704 These Regulations do not apply to existing exposure situations (see paragraph 3 for guidance on 'existing exposure situation' which is referred to as 'the recovery phase' below). Existing exposure situations are covered by the Radioactive Contaminated Land

(2)(l)

regime and other legislation, such as the Environmental Permitting Regulations in England and Wales and the Environmental Authorisations (Scotland) Regulations 2018 in Scotland for the management of radioactive wastes arising. However, under these Regulations arrangements must be made to assist in transitioning effectively to the recovery phase.

705 Decisions made in the response phase may impact the ability to deliver recovery successfully, so the recovery phase should begin at the earliest opportunity following the onset of an emergency, running alongside the response to the emergency. The process is transitional as some aspects of the response may progress to recovery sooner than others. The handover of coordination from the response phase to the recovery phase should take place when pre-agreed criteria have been met.

706 The arrangements should include:

(a) the process for establishing the recovery phase, including the necessary roles, responsibilities and structures (e.g. working groups) to coordinate recovery;

(b) the recovery activities which should be completed during the response phase, for example, development of a recovery strategy;

(c) the process for handover of coordination from the response phase to the emergency phase, including the criteria to assess readiness for handover which should be confirmed early on in the response phase (criteria may include, for example, whether the on-site incident has been contained and is stable and whether any urgent protective action has been lifted); and

(d) the types of information that should be handed over (for example, an impact assessment and information collated as part of the response phase such as a report on the status of all emergency phase action and outstanding issues) and how this will be effectively handed over to those responsible for coordinating recovery and

(e) communications to other responding organisations and the community about the handover.

707 The NNEPRG Recovery guidance documents, Cabinet Office guidance on Emergency Response and Recovery and Preparing Scotland: Scottish Guidance on Resilience, set out further guidance on transition from the response to recovery phase.

Guidance Schedule 6 Part 2 Chapter 2

CHAPTER 2

Information about outline planning zones

708 There is no difference in the types of response activity that will be planned for under both detailed and outline planning. The level of planning will differ however. The table below sets out some illustrative examples to demonstrate the difference between detailed and outline planning.

Capability	Detailed Planning	Outline Planning
Evacuation by bus	• Local planners know how many buses they can rely on for an immediate response, where the buses will go and what they will do. • This is agreed between the local authority and private bus companies via a formal memorandum of understanding	• Local planners know approximately how many buses might be available and when, recognising that this is not guaranteed. • Local planners know how to mobilise the buses and understand that they need to instruct the company what to

		(MOU). • There are standard operating procedures (SOP) setting out what drivers should do. • Drivers receive training.	do (based on the prevailing circumstances of the emergency), as this would not have been pre-agreed. • Although these plans are written down, there is no MOU, SOPs or training formalising this arrangement.
	Demographic Assessment	• Population within the detailed emergency planning zone has been identified in detail to show number of residents, specific vulnerable groups such as schools or care homes (with staff and pupils or people in care numbers) and where transitory groups are, for example caravan sites or bird sanctuaries. • This has been mapped to identifiable sectors. • Each vulnerable group has an identified point of contact and has been visited by planners to explain nuclear emergency arrangements. • Specific advice for vulnerable groups has been developed and issued.	• Population has been quantified in larger sectors and vulnerable locations mapped. • No contact has been made with vulnerable groups nor have they been provided with specific advice. • This information contributes to the understanding of potential impact on the population.
	Transport Access Management	• Affected rail links identified in the plan with communication protocols agreed with the rail operator in case of an emergency and included in the off-site emergency plan. • Road blocks preventing access to the detailed emergency planning zone identified and available on maps in the off-site emergency plan – equipment, personnel and timeline identified for establishing and maintaining the road blocks.	• Potentially affected rail links identified on a map within the outline planning zone and contact number for the organisation maintained within the off-site emergency plan. • Potential locations for road blocks to prevent public access to the outline planning zone identified and mapped in the plan.
Schedule 6 Part 2 Chapter 2 (3)(a)	*3. The information referred to in regulation 11(3)(b) is as follows—* *(a) where there is no detailed emergency planning zone, the information set out at paragraph 2; and*		
Guidance Part 2 Chapter 2 (3)(a)	709 Where a premises requires an outline planning zone only the information in Schedule 6, Part 2, Chapter 1 must be included in the off-site emergency plan for that outline planning zone but the degree of planning should be proportionate, in line with the guidance set out below. Where there is a detailed emergency planning zone, any outline planning		

	within the off-site emergency plan should set out how the arrangements covered in Schedule 6, Part 2, Chapter 1 could be extended to cover the geographical area of the outline planning zone by describing the decision points and escalation routes to make timely decisions on the expansion of response capabilities into parts or all of the outline planning zone. 710 It should not generally be necessary to plan the deployment of equipment, people or resources to support outline planning arrangements but outline planning should identify where capabilities could be obtained from. Arrangements for these would be developed following a radiation emergency and after having confirmed the scale and nature of the radiation emergency. If the local authority considers that additional resources may be required for the outline planning arrangements, they should discuss this with the operator and relevant off-site organisations to confirm their proportionality before considering inclusion within the off-site emergency plan. 711 For non-nuclear sites, local authorities should consider the generic emergency planning arrangements already in place (for flooding, chemical releases etc.) to decide whether these are sufficient to deal with the consequences of a radiation emergency or whether these are the basis from which additional outline planning needs to be undertaken. For example an additional reactive communications plan for radiological events may be required for a non-nuclear site. 712 Some elements of detailed planning may be required within the outline planning zone (for further guidance on detailed planning in outline planning zones see paragraph xxx). 713 Outline emergency planning arrangements should be uniform across the outline planning zone. 714 In relation to the outline planning zone, the off-site emergency plan should contain as a minimum: (a) relevant information about population demographics (see table above); (b) information to assist in the implementation of protective action (see examples in the table above) and how the decision to implement protective action would be made; (c) prepared information that could be provided to the public in the outline planning zone and how this would be provided (this will refer to the prior information that will have been made available to members of the public in the outline planning zone (see regulation 21) and the supply of information to the public in the event of a radiation emergency (see regulation 22)); and (d) when regional (e.g. a neighbouring local authority) or national support would be needed and how that could be requested (see regulation 14 on co-operation between local authorities).
Schedule 6 Part 2 Chapter 2 (3)(b)(i)	*(b) in all cases—* *(i) at what stage and how the response to a radiation emergency triggers a response within the outline planning zone; and*
Guidance Part 2 Chapter 2 (3)(b)(i)	715 A response in the outline planning zone may be triggered when a low probability event, up to and including unforeseen events occurs or where the potential increased scale and nature of a radiological hazard has been confirmed during the response, meaning that a radiation emergency is likely to affect the outline planning zone. 716 For premises where there is an outline planning zone the off-site emergency plan should include arrangements for triggering a response in the outline planning zone and extending the arrangements of the detailed emergency planning zone where one exists. 717 In the event of radiation emergency, or an event which might lead to a radiation

	emergency, within the outline planning zone the parts of the off-site emergency plan relating to outline planning should be implemented (see regulation 17). When the operator informs the local authority that it has put its plan into effect under regulation 17(2), the operator needs to provide information on whether the radiation emergency extends to the outline planning zone. In an escalating situation, a response in a detailed emergency planning zone (where one exists) may need to be extended to the outline planning zone and arrangements should ensure that there is swift communication of such information between the operator and the local authority and off-site organisations (see regulation 13(b)).
Schedule 6 Part 2 Chapter 2 (3)(b)(ii) & (4)	*(ii) whether there are any areas of detailed planning within the outline planning zone and, if s, the detailed planning arrangements in respect of any such area.* *4. In paragraph 3(b)(ii), an area of detailed planning within the outline planning zone means an area within which a greater degree of planning is necessary as a result of the existence of particular factors such as schools or hospitals within that area.*
Guidance Part 2 Chapter 2 (3)(b)(ii) & (4)	718 The local authority should identify any areas, or 'pockets', in the outline planning zone where detailed planning is considered necessary based on the factors below and only where it is considered proportionate to do so. The factors which should prompt consideration of detailed planning pockets are: (a) vulnerable groups with a substantive reduced ability to respond to a radiation emergency such as schools or hospitals; (b) particular groups or areas where existing planning arrangements are insufficient; and (c) groups immediately adjacent to the boundary of the detailed emergency planning zone. 719 A proportionate and graded approach should be taken in the identification of detailed planning pockets based on the consequences and likelihood of a radiation emergency in the outline planning zone, the distance from site or the detailed emergency planning zone, and optimisation of protection (see Schedule 7, Part 1, 1(d)). 720 Pockets of detailed planning should be considered as part of the detailed emergency planning zone and therefore the requirements of Schedule 6, Part 2, Chapter 1 must be applied. Identification of such pockets should take place when the detailed emergency planning zone is determined in accordance with regulation 8.
Schedule 6 Part Chapter 3 5(a)	*CHAPTER 3* *Information which an off-site emergency plan must contain* *(5) In order to comply with regulation 11(3)(c) an off-site emergency plan must—* *(a) set out the extent of the detailed emergency planning zone (if any) and the outline planning zone (if any);*
Guidance Part 2 Chapter 3 5(a)	721 This should describe the size and shape of the detailed emergency planning zone and/or the outline planning zone. This should take the form of map showing the boundaries of the area(s) and may be accompanied by a general description of the area(s) to aid understanding.
Schedule 6 Part 2 Chapter 3 5(b)(c)	*(b) in respect of the detailed emergency planning zone, set out—* *(i) the severity of the consequences in terms of dose quantity;* *(ii) the extent to which the consequences can be mitigated by timely action;* *(c) set out how the off-site emergency plan aims to mitigate the consequence of an emergency, in response to the factors listed at (b); and*

Guidance Part 2 Chapter 3 5(b)(c)	722 The information required by 5 (b)(i) should be provided by the operator. The arrangements set out in the off-site emergency plan should take this information into account along with any other relevant information provided by the operator such as recommended distances for urgent protective action together with timescales for their implementation and details of the environmental pathways at risk, including any food and water restrictions (see regulation 7). 723 The local authority should set out in its off-site emergency plan how the consequences of a radiation emergency will be mitigated. To achieve this, the local authority needs to draw on its own emergency planning expertise together with the expertise of other responding organisations. PHE's document on Advice for Public Health Protection in the Event of Radiation Emergencies [Ref: XX] provides further guidance on protective action and associated effectiveness.
Schedule 6 Part 2 Chapter 3 5(d)	*(d) set out the process for determining when the site and the surrounding area is no longer in an emergency state.*
Guidance Part 2 Chapter 3 5(d)	724 See guidance on Schedule 6, Part 2, Chapter 1, (l).

Schedule 7 Principles and purposes of emergency plans

Regulations 10(3) and 11(3)

Schedule 7 Part 1 (1)(a-d)

PART 1

Principles to which emergency plans must have regard

(1) The person with responsibility for preparing an emergency plan under these Regulations must consider the following principles when preparing that plan—

(a) the necessity for the plan to respond to the particular characteristics of a given radiation emergency as those characteristics emerge;

(b) the necessity to optimise protection strategies to ensure that the proposed response, as a whole, is predicted to do more to mitigate the radiation emergency and facilitate transition from that emergency than to increase its duration or consequence, taking into account—

(i) the health risks arising from exposure to ionising radiation as a result of the radiation emergency, in both the long and the short term;

(ii) the economic consequences of the radiation emergency;

(iii) the effects of the disruption, both on the premises and the area immediately surrounding it, and on the public perception of the effects of the radiation emergency;

(c) the necessity of avoiding, so far as possible, the occurrence of serious physical injury to any person or persons;

(d) the necessity of ensuring that an appropriate balance is struck between the

	expected harms and benefits of any particular protective action so as to maximise the benefit of that action.
Guidance Part 1 (1)(a-d)	725 The operator should have arrangements in place to promptly assess and anticipate the characteristics of a radiation emergency to respond accordingly. The off-site emergency plan must also enable a response to the particular characteristics of a radiation emergency as they emerge. An effective system for managing information between the operator and the local authority and off-site organisations in the event of a radiation emergency will help in achieving this. 726 Advice on protective action is provided by PHE, who is responsible for advising UK government bodies on radiation protection of the public. PHE's document on Advice for Public Health Protection in the Event of Radiation Emergencies provides further guidance on the principles of radiation protection for radiation emergencies, protective action and ERLs. 727 Protection strategies should be optimised and require a balance to be struck between the expected benefits and detriments of introducing particular protective actions, so that the margin of benefit over detriment is maximised. This applies to all consequences of implementing protective action, including radiation health risks, wider health risks (including psychological impact); consequential injuries; economic consequences; social and environmental factors. The aim is that the implemented strategy should provide the best outcome possible for the affected population, taking account of all the wider consequences. 728 Economic consequences (e.g. costs involved for the local population if they need to be evacuated or environmental harm resulting from a particular protection strategy) should be taken into account as part of the detriment. Remedial measures can affect the radioactive waste arising from a radiation emergency and handling such waste may also contribute to costs. 729 Wider health risks associated with a radiation emergency include psychological impact and this should also be taken into account when considering the detriment associated with particular protection strategies. To minimise this type of health impact, plans need to prioritise the provision of timely and credible information and support and its delivery over a potentially wide area. It needs to be recognised that people in areas completely unaffected by any radiation release and at considerable distances from the site of the emergency may be as susceptible to this type of psychological health impact as those in the vicinity of the site. 730 In relation to urgent protective action PHE's ERLs consider the balance between the benefit from reducing the dose against the other consequences of implementing the protective action. During planning, the ERLs provide guidance on where this balance lies for urgent protective action.
Schedule 7 Part 2 (2)(a)	***PART 2*** ***Purposes of emergency plans*** *(2) The person with responsibility for preparing an emergency plan under these Regulations must ensure that the plan fulfils the following purposes—* *(a) to reduce or stop the effects of the radiation emergency;*
Guidance Part 2	731 The operator has a key role in reducing or stopping the release of radiation or

(2)(a)	radioactive substances from the premises. The operator's emergency plan should describe the measures and arrangements to do this. 732 Where off-site organisations (e.g. the fire and rescue service) have a role to play in reducing or stopping the release of radiation or radioactive substances from the premises, the off-site emergency plan should describe the arrangements for providing assistance to the operator.
Schedule 7 Part 2 (2)(b)(c)	*(b) to reduce the exposure to individuals and to the environment resulting from the release of ionising radiation;* *(c) if necessary, to ensure that provision is made for the medical treatment of those affected by the radiation emergency; and*
Guidance Part 2 (2)(b)(c)	733 The operator's emergency plan should describe arrangements to restrict the exposure of employees and others on the premises in the event of a radiation emergency. It should also describe how off-site organisations will be advised of the nature, quantity and geographical extent of the release so that those organisations can take steps to restrict the exposure of the public from radioactive substances in the environment and/or provide medical treatment as necessary. 734 The off-site emergency plan should describe arrangements to restrict the exposure of off-site responders and members of the public outside the premises. These steps may include, for example, the provision of advice on sheltering or evacuation. Off-site organisations also have a key role in reducing the transfer of radioactive substances to individuals from the environment. The operator can advise on the nature, quantity and geographical extent of the release so that those organisations can take steps to restrict the exposure of the public from radioactive substances in the environment and / or provide medical treatment as necessary. Steps taken to restrict exposure may include, for example, the production of advice to restrict the consumption of certain foodstuffs or restrict particular water supplies. This advice would be provided bv the responsible organisation, for example, Food Standards Agency / Food Standards Scotland is responsible for ensuring food safety in the event of a radiation emergency. The off-site emergency plan should describe the arrangements for initiating and implementing the food safety response. PHE's document on Advice for Public Health Protection in the Event of Radiation Emergencies provides further guidance on Maximum Permitted Levels in food and action levels in drinking water. 735 Fulfilling the purpose set out in part (a) will help to reduce exposure to the environment and steps taken to protect human health can also provide protection for the environment. 736 Plans should describe the arrangements for accessing medical treatment. The medical treatment is relevant to both and on and off-site casualties.
Schedule 7 Part 2 (2)(d)	*d) to prioritise the implementation of the plan in relation to a person exposed to a dose consequence in excess of the reference levels set out in regulation 20.*
Guidance Part 2 (2)(d)	737 See regulation 20 for further guidance.

Schedule 8	**Prior information to be supplied and made publicly available** Regulation 21(1)
Guidance Schedule 8	738 The purpose of this Schedule is to set out the minimum content that the prior information requires in regulation 21. 739 Prior information is intended to give the local population a sufficiently clear understanding of the action that they may be asked to take in a radiation emergency, so that should such an event occur, the necessary protective action can be implemented smoothly and speedily. Information should therefore be drafted and presented with absolute clarity and in a way that creates understanding and awareness, not alarm. 740 When deciding what type of information to publish, local authorities should consider the following points: (a) how the public will receive the information: This will differ between the detailed emergency planning zone and outline planning zone (see paragraphs xxx) and consideration should be given to who the target audience is and their information needs. Public information materials should be accessible and available in a range of formats; (b) how to ensure it will be easily understood by members of the public: Information should be factual and accurate and provided in clear and comprehensible language. Particular care should be taken to consider the needs of vulnerable people or those who may not understand the messages (such as children in schools). Excessive use of technical information or jargon may be difficult for people to read and absorb quickly, which can in turn lead to confusion and uncertainty about what they need to know or what action they should take. The use of maps and illustrations can be a particularly effective way of putting over the required information; and (c) whether action is to be taken by members of the public: The key messages of the information should be considered and the information should communicate clearly the action that members of the public should take. 741 Prior information should also include: (a) whether any additional and more detailed information has been made publicly available (by the local authority or other organisations) and if so where it can be found; and (b) the date of publication of the prior information and its period of validity (which should not exceed three years).
Schedule 8 Part 1, 1	*PART 1* *Information in relation to detailed emergency planning zones* *(1) Basic facts about ionising radiation and its effects on persons and on the environment.*
Guidance Part 1, 1	742 The facts about radioactivity should introduce the reader to basic concepts, such as radiation dose, quantities and units. An explanation of background radiation and doses from background radiation may also be helpful here. The explanation on the effects of radioactivity should highlight the difference between internal and external radiation, the exposure pathways for humans, including through contaminated food and drink, and the

	short- and long-term effects of exposure and how these are affected by the level of dose. 743 This information is not premises-specific and should not change significantly with time. So, it would be permissible for this purpose to use a suitable leaflet or booklet produced by another organisation. However, it should still be distributed at the same time as and associated with the other information.
Schedule 8 Part 1, 2	*(2) The various types of radiation emergency identified and their consequences for the general public and the environment.*
Guidance Part 1, 2	744 The information provided should describe in terms comprehensible to the reader the work activity and event(s) which may give rise to a radiation emergency, and the likelihood of such an emergency occurring. How such emergencies can affect people and the environment (for example through dispersion and settling of radioactive dust) should then be explained. The role of the weather and particularly the effect of wind direction should also be explained in terms of its consequences for exposure and causing contamination, and how rapidly this would occur.
Schedule 8 Part 1, 3	*(3) Protective action envisaged to alert, protect and assist the general public in the event of a radiation emergency.*
Guidance Part 1, 3	745 The information provided should specify how people will be initially alerted to the existence of a radiation emergency which might affect them. How they can continue to keep themselves informed on the development of events should also be stated. This is normally achieved by tuning to a local radio or television station with whom prior agreement has been reached to perform this role (such an agreement should form part of the arrangements that local authorities are required to prepare under regulation 22). The information should also advise which websites, social media accounts and any other communciation channels will be updated during a radiation emeregency. 746 There should then be a general description of the off-site emergency plan in so far as it concerns the protection of the public, including any links to the off-site emergency plan where it is published.
Schedule 8 Part 1, 4	*(4) Appropriate information on protective action to be taken by the general public in the event of a radiation emergency.*
Guidance Part 1, 4	747 This is the key part of the prior information which describes the action that people should take if a radiation emergency occurs and how each different protective action will work in terms of reducing radiation doses. It should cover such matters as: (a) sheltering and associated action; (b) distribution and taking of stable iodine tablets, where appropriate; (c) evacuation, how the advice is to be given, what action to take before leaving, what to do with pets and other animals, what to take, how to go, where to go; (d) arrangements for particular groups such as children at school, the sick and elderly; and (e) longer term advice on the consumption of contaminated food and drink.
Schedule 8 Part 1, 5	*(5) The authority or authorities responsible for implementing the protective action referred to in paragraphs 3 and 4 above.*
Guidance Part 1, 5	748 The information provided in response to paragraphs 3 and 4 should make clear which authorities are responsible for implementing the protective action described.

Schedule 8 Part 1, 6	*(6) The extent of the detailed emergency planning zone.*
Guidance Part 1, 6	749 The information provided should describe the size and shape of the detailed emergency planning zone. This should take the form of a map showing the detailed emergency planning zone and may be accompanied by a general description of the area to aid understanding.
Schedule 8 Part 2, 7	*PART 2* *Information in relation to outline planning zones* *(7) Where the information set out at paragraphs 1 to 5 can be obtained.*
Guidance Part 2, 7	750 There is little difference in the types of information that the public should have access to in the detailed emergency planning zone and the outline planning zone, however the information required by Part 1, paragraphs (2), (3), (4) and (5) should reflect the arrangements in the outline planning zone and the level of detail should be proportionate to the level of planning. For example it may be appropriate to provide a short summary of the emergency arrangements to make people living further afield aware of such arrangements. This does not necessarily need to specify any specific action but should detail further sources of information and indicate that in the extremely unlikely event of a radiation emergency that triggers a response in the outline planning zone, members of the public in the area may be asked to take action but that more information will be provided at the time. 751 The manner in which members of the public are provided with access to prior information will differ in the outline planning zone compared with the detailed emergency planning zone. See regulation 21(1) paragraphs xxx for further guidance.
Schedule 8 Part 2, 8	*(8) The extent of the outline planning zone.*
Guidance Part 2, 8	752 The information provided should include a description of the size and shape of the outline planning zone. This should take the form of a map showing the outline planning zone and may be accompanied by a general description of the area to aid understanding.
Schedule 8 Part 2, 9	*(9) The factors which would cause the plan in respect of the outline planning zone to be triggered, and whether there are any areas of detailed planning within the outline planning zone as defined at paragraph 4 of Part 2 of Schedule 6.*
Guidance Part 2, 9	753 This information must state at what stage and how the response to an emergency would trigger a response within the outline planning zone (see paragraph xxx for further guidance). This should describe in terms comprehensible to the reader the work activity and event(s) which may give rise to a radiation emergency which triggers a response in the outline planning zone, and the likelihood of such an emergency occurring. 754 Where there are pockets of detailed planning within the outline planning zone (see paragraph xxx for further guidance) prior information should be distributed to such groups in the same manner as that received by members of the public within the detailed emergency planning zone.

Schedule 9 Information to be supplied in the event of a radiation emergency

Regulation 22(4)

Guidance Schedule 9	755 This Schedule lists information to be provided in the event of an actual emergency through the arrangements established by local authorities under regulation 22. Regulation 22(4) makes clear that only information relevant to a particular type of emergency needs to be supplied. Inclusion of information that is not relevant to the particular circumstances of the emergency is likely to cause confusion and be counterproductive. 756 The information will be similar in scope to that required for prior information (see regulation 21 or the information made available for transport emergencies by Great Britian's Transport Competent Authority (Office for Nuclear Regulation)) but only in respect of the specific emergency that has arisen. Where protective action is referred to, regulation 22(4) requires the information to identify the authority or authorities responsible for implementing that measure. 757 Local authorities should develop pre-prepared information where possible and could use existing materials where appropriate, for example plain language information on radioactivity and its effects. In the event of an emergency, the local authority should then select the relevant pre-prepared information to provide to the public, amending it as appropriate to reflect the actual situation which occurs. Local authorities with off-site emergency plans under these Regulations should base this information on the protective action within the plan.
Schedule 9(1)	*1. Information on the type of emergency which has occurred, and, where possible, its characteristics, for example, its origin, extent and probable development.*
Guidance Schedule 9(1)	758 This would be much as provided under paragraph 2 of Schedule 8, but related to the specific emergency that has occurred, the conditions that actually exist and the likely course of development. 759 The IAEA's International Nuclear and Radiological Event Scale (INES) can be used as part of the communications strategy as a means of informing the public of the safety significance of nuclear and radiological events.
Schedule 9(2)	*2. Advice on protective action which may include, depending on the type of emergency—* *(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.*
Guidance Schedule 9(2)	760 Similarly, this should be much as provided under paragraph 4 of Schedule 8, but related to the specific protective action relevant to the circumstances. Details concerning evacuation arrangements are especially important. The target audience of information in

	respect of sub-paragraph (a) could include providers of fresh food and water, for example farmers and water suppliers, as well as consumers. (See paragraph 565 on regulation 22(3) regarding informing the public about restrictions on consumption of water.)
Schedule 9(3)	*3. Details concerning any announcements recommending cooperation with instructions or requests by the regulator.*
Guidance Schedule 9(3)	761 Individuals cannot be compelled to co-operate with any protective action decided on (such as evacuation), but any announcements should make clear that this is authoritative advice which it is in their interests to follow.
Schedule 9(4)	*4. Where an incident which is likely to give rise to a release of radioactivity or ionising radiation has taken place but no release has yet occurred, the information and advice should include the following—* *(a) details of the relevant communications channels on which information about the incident will be available;* *(b) preparatory advice to establishments with particular collective responsibilities; and* *(c) recommendations to occupational groups particularly affected.*
Guidance Schedule 9(4)	762 Where an accident does not lead immediately to a release of radioactivity, advantage should be taken of this pre-release period so far as is reasonably practicable (whilst considering the effects of the pre-release information, see paragraph xxx for further guidance) to: (a) prepare people by advising them how to access the relevant communication channels to receive information, for example by getting them to tune in to local radio and television stations; (b) alert and provide preparatory advice to establishments within the potentially affected area, such as schools, factories, commercial buildings, hospitals, general practices and nursing homes; and (c) advise particular groups of people, such as children and pregnant women, regarding food and drink consumption, and farmers regarding their crops and livestock. 763 The local authority should also consider particular establishments as priority places for the receipt of information about an emergency, including its magnitude, likely impact and guidance on the steps to be taken.
Schedule 9(5)	*5. If time permits, information setting out the basic facts about radioactivity and its effects on persons and on the environment.*
Guidance Schedule 9(5)	764 Under emergency circumstances, distribution of this background information cannot be a priority, but as time passes and if the pressure eases, this should be given attention. This information is the same as required by paragraph 1 of Schedule 8, and where a standard leaflet or booklet has been used for this purpose, this could be distributed to those affected. In the case of transport emergencies the prior information provided by the Office for Nuclear Regulation on its website could be used.
Schedule 9(6)	*6. In paragraph 4(b), "establishments with particular collective responsibilities" means hospitals, care homes, schools or similar establishments.*

Schedule 10 Consequential amendments

Regulation 29

Schedule 10

Road Vehicles (Construction and Use) Regulations 1986

1. *Regulation 37 of the Road Vehicles (Construction and Use) Regulations 1986(**15**) is amended as follows—*

(a) in paragraph (5)(k) omit "radiation accident or" in both place it occurs; and

(b) in paragraph (9A) for the definition of "radiation accident" and "radiation emergency" substitute—

""radiation emergency" has the same meaning as in the Radiation (Emergency Preparedness and Public Information) Regulations 2019.".

Road Vehicles Lighting Regulations 1989

*2. Regulation 3 of the Road Vehicles Lighting Regulations 1989(**16**) is amended as follows—*

(f) in the definition of "emergency vehicle" omit "radiation accident or" in both places it occurs; and

(g) in the definition of "radiation accident" and "radiation emergency"—

(i) omit "radiation accident and"; and

(ii) for "2001" substitute "2019".

Health and Safety (Enforcing Authority) Regulations 1998

*3. In regulation 4A(2)(aa) of the Health and Safety (Enforcing Authority) Regulations 1998(**17**) for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019".*

Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005

*4. In regulation 9(c) of the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005(**18**) for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019".*

([15]) S.I. 1986/1078. Paragraph (5)(k) and (9A) were substituted by S.I. 2011/935. There are other amendments, but none are relevant to this instrument.

([16]) S.I. 1989/1796. Regulation 3 was amended by S.I. 2005/2559. There are other amendments, but none are relevant to this instrument.

([17]) S.I. 1998/494. Regulation 4A was inserted by S.I. 2014/469 and amended by S.I. 2017/1075.

([18]) S.S.I. 2005/494. Regulation 9 has been amended, but that amendment is not relevant to this instrument.

	Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005 *5. In regulation 12(e) of the Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005(**19**) for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019".* ***Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006*** *6. In regulation 17(3) of the Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006(**20**) in the inserted paragraph (4C) for "paragraph (2) of regulation 13 (implementation of emergency plans) of the Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "paragraph (3) of regulation 17 (implementation of emergency plans) of the Radiation (Emergency Preparedness and Public Information) Regulations 2019".* ***Radioactive Contaminated Land (Modification of Enactments) (Wales) Regulations 2006*** *7. In regulation 17(3) of the Radioactive Contaminated Land (Modification of Enactments) (Wales) Regulations 2006(**21**) in the inserted paragraph (4C) for "paragraph (2) of regulation 13 (implementation of emergency plans) of the Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "paragraph (3) of regulation 17 (implementation of emergency plans) of the Radiation (Emergency Preparedness and Public Information) Regulations 2019".* ***Radioactive Contaminated Land (Scotland) Regulations 2007*** *8. In regulation 15 of the Radioactive Contaminated Land (Scotland) Regulations 2007(**22**) in the inserted subsection 7(a) for "regulation 12(2) of the Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "regulation 17(3) of the Radiation (Emergency Preparedness and Public Information) Regulations 2019".* ***Local Government (Structural Changes) (Transitional Arrangements) (No. 2) Regulations 2008*** *9. (1) Regulation 11 of the Local Government (Structural Changes) (Transitional Arrangements) (No. 2) Regulations 2008(**23**) is amended as follows.* *(2) In paragraph (2)(c) for "regulation 9 of the Radiation (Emergency Preparedness and Public Information) Regulations ("the 2001 Regulations") substitute "regulation 11 of the Radiation (Emergency Preparedness and Public Information) Regulations 2019 ("the 2019 Regulations")".* *(3) In paragraph 4—* *(a) in sub-paragraph (a) for "2001" substitute "2019";*

(19) S.I. 2005/2043. Regulation 12 has been amended, but that amendment is not relevant to this instrument.
(20) S.I. 2006/1379. Regulation 17 was substituted by S.I. 2008/520. Other amendments have been made but none are relevant to this instrument.
(21) S.I. 2006/2988 (W. 277). Regulation 17 was substituted by S.I. 2008/521. Other amendments have been made but none are relevant to this instrument.
(22) S.S.I. 2007/179. Regulation 15 was substituted by S.I. 2007/3240. Other amendments have been made but none are relevant to this instrument.
(23) S.I. 2008/2867. Amendments have been made but none are relevant to this instrument.

(b) in sub-paragraph (b) from "an assessment" to the end, substitute "an evaluation or an assessment made by the operator under regulation 4 or 6 of the 2019 Regulations which does not reveal the potential for the occurrence of a radiation emergency".

(4) In paragraph 5 for "2001" substitute "2019".

Human Medicines Regulations 2012

*10. (1) The Human Medicines Regulations 2012(**24**) are amended as follows.*

(2) In regulation 8(1) in the definition of radiation emergency for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019".

(3) In the entry numbered 19 in the first column of the table in Part 5 of Schedule 17 for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019".

Infrastructure Planning (Interested Parties and Miscellaneous Prescribed Provisions) Regulations 2015

*11. The table in Part 2 of Schedule 2 to the Infrastructure Planning (Interested Parties and Miscellaneous Prescribed Provisions) Regulations 2015(**25**) is amended as follows—*

(a) in column 1 for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019"; and

(b) for column 2 of the entry for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute—

"Any evaluation required under regulation 4 (hazard evaluation)

Any assessment required under regulation 5 (consequence assessment)

Any assessment required under regulation 6 (review of hazard evaluation and consequence assessment)".

Health and Safety and Nuclear (Fees) Regulations 2016

*12. (1)The Health and Safety and Nuclear (Fees) Regulations 2016(**26**) are amended as follows.*

(2) In regulation 8—

(a) in the heading for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019";

(b) in paragraph 4 for "2001" in each place it occurs substitute "2019";

(c) in paragraph 11 for the definition of "the 2001 Regulations" substitute—

""the 2019 Regulations" means the Radiation (Emergency Preparedness and Public

(24) S.I. 2012/1916, which was amended by S.I. 2018/64 and S.I. 2018/199.
(25) S.I. 2015/462. Amendments have been made but none are relevant to this instrument.
(26) S.I. 2016/253. Regulation 8 was amended by S.I. 2017/1075. Other amendments have been made but none are relevant to this instrument.

	Information) Regulations 2019". *(3) In Schedule 6—* *(a) in the heading for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019";* *(b) in the first column of table 2 for "regulation 14 of the 2001 Regulations" in both places it occurs substitute "regulation 18 of the 2019 Regulations".* ***Ionising Radiations Regulations 2017*** *13. In regulation 36(1) of the Ionising Radiations Regulations 2017(**27**) for "Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "Radiation (Emergency Preparedness and Public Information) Regulations 2019".* ***Ionising Radiation (Basic Safety Standards) (Miscellaneous Provisions) Regulations 2018*** 14. *In regulation 4(2)(a) of the Ionising Radiation (Basic Safety Standards) (Miscellaneous Provisions) Regulations 2018(**28**) for "paragraph (2) of regulation 13 (implementation of emergency plans) of the Radiation (Emergency Preparedness and Public Information) Regulations 2001" substitute "paragraph (3) of regulation 17 of the Radiation (Emergency Preparedness and Public Information) Regulations 2019".* *(**1**) S.I. 2016/253. Regulation 8 was amended by S.I. 2017/1075. Other amendments have been made but none are relevant to this instrument.* *(**1**) S.I. 2017/1075. Amendments have been made but none are relevant to this instrument.* *(**1**)S.I. 2018/482. Amendments have been made but none are relevant to this instrument.*
Guidance Schedule 10	**EXPLANATORY NOTE** *(This note is not part of the Regulations)* *These Regulations revoke and supersede the Radiation (Emergency Preparedness and Public Information) Regulations 2001.* *The Regulations impose duties on operators of premises in which work with ionising radiation takes place to identify the hazards arising from the work with such radiation which have the potential to cause a radiation emergency. Where such hazards exist, the operator is under a duty to assess the consequences of the radiation emergency, and liaise with the local authority. Both the local authority and the operator must engage in planning against the radiation emergency occurring, test such plans at regular intervals and provide information to the public.* *The Regulations implement in part as respects Great Britain provisions of Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom (OJ No L13, 17.1.2014, p 1).* *Regulation 3 makes provision for the application of the Regulations. The Regulations apply to work with ionising radiation on premises on which there is a radioactive substance containing more than the quantity of any radionuclide set out in Schedule 1, or,*

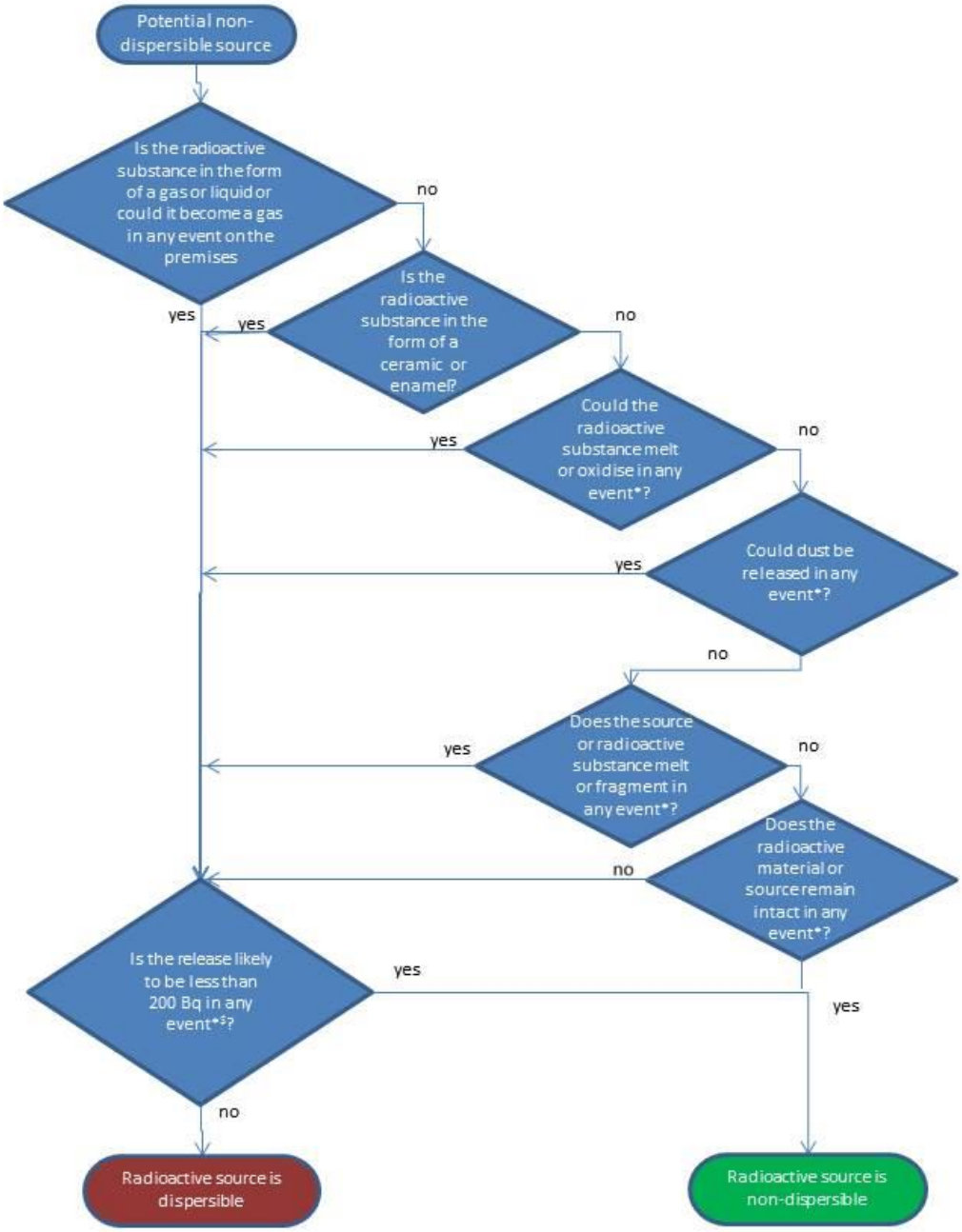
(27) S.I. 2017/1075. Amendments have been made but none are relevant to this instrument.
(28) S.I. 2018/482. Amendments have been made but none are relevant to this instrument.

	in the case of fissile material, more than the mass of the fissile material, as set out in Schedule 2. Where a radionuclide is not specified in Schedule 1, the operator must assess whether the quantity present on the premises would allow an annual dose of greater than 1 mSv, and, if so, these Regulations also apply. *Regulation 4 provides that the operator must, before work is carried out for the first time at the premises, carry out an evaluation of the hazards arising from the work undertaken on the premises to determine whether they have the potential to cause a radiation emergency. Where they have that potential, regulation 4 require operators to undertake protective action.* *Regulation 5 provides that, where an operator has identified the potential for a radiation emergency pursuant to its evaluation, the operator must make a further assessment in accordance with Schedule 3 to evaluate a full range of consequences of such a radiation emergency.* *Regulation 6 provides that, where the operator proposes a change in its work with ionising radiation, or where a change occurs, the operator must undertake review of its evaluation in accordance with regulation 4 and either make a further assessment in accordance with regulation 5 or make a declaration that the change of circumstances which triggered the review would not affect the last evaluation.* *Regulation 7 requires the operator to send a consequences report to the local authority, which includes a proposed detailed emergency planning zone, and must discuss those consequences with the local authority.* *Regulation 8 provides that it is the responsibility of the local authority to determine the detailed emergency planning zone, either on the basis of the operator's proposal or, on the basis that the local authority's off-site emergency plan requires it, to extend the detailed emergency planning zone.* *Regulation 9 provides for who will determine an outline planning zone in relation to certain sites.* *Regulation 10 provides that the operator is responsible for preparing an emergency plan where the evaluation under regulation 4 shows that a radiation emergency may arise.* *Regulation 11 provides that, where there is a detailed emergency planning zone, an outline planning zone, or both, the local authority must prepare an off-site emergency plan to mitigate the consequences of a radiation emergency outside the operator's premises.* *Regulation 12 makes provision for the reviewing and testing of both the operator's on-site emergency plan and the local authority's off-site emergency plan.* *Regulation 13 provides for cooperation between the operator and the local authority in fulfilling their duties to prepare emergency plans, and regulation 14 provides for cooperation between local authorities in the making and testing of off-site emergency plans. Regulation 15 provides for cooperation between operators and other employers on the same premises.* *Regulation 16 provides that a local authority may charge the operator for performing its functions in relation to the preparation and testing of an off-site emergency plan.* *Regulation 17 sets out when operators and local authorities should implement their emergency plans and who should be informed about that implementation. Regulation 17 also provides for a full assessment of the consequences of any radiation emergency which occurs and the effectiveness of the emergency plans after any implementation.* *Regulation 18 provides that training and equipment should be provided to employees by their employer where there is the possibility of that employee receiving an emergency exposure of ionising radiation and makes further provision for employees where an*

	emergency plan is put into place. *Regulation 19 disapplies regulation 12 of the Ionising Radiations Regulations 2017 to an emergency worker who is engaged in preventing or mitigating the consequences of a radiation emergency.* *Regulation 20 provides that the operator's emergency plans and the local authority's off-site emergency plans must prioritise reducing doses below 100 mSv. When the response to a radiation emergency is underway, specific reference levels for the public may be determined by the local authority, who may seek advice from the person coordinating the off-site response to that emergency. In exceptional circumstances, the reference level for emergency workers may be set in excess of 100 mSv, but not exceeding 500 mSv.* *Regulations 21 and 22 provide for information to be provided to the public in an area covered by a detailed emergency planning zone and in the event of an emergency respectively.* *Regulation 23 provides for the retention of information by the operator and the local authority.* *Regulation 24 contains provisions requiring employers to consult radiation protection advisors where the employer is engaged in work with ionising radiation for the purposes of the radiation protection advisor to advice on compliance with these Regulations.* *Regulation 25 provides for specific modifications of the Regulations for the purposes of the Ministry of Defence, relating to national security.* *Regulation 26 provides that, where a person is entitled to seek information under the Regulations, the Secretary of State may certify that the provision of that information would be contrary to the interests of national security.* *Regulation 27 provides for the revocation of the Radiation (Emergency Preparedness and Public Information) Regulations 2001, subject to the transitional and savings provisions set out in regulation 28.* *Regulation 29 and Schedule 10 provide for consequential amendments.* *Regulation 30 provides that the Secretary of State must review the Regulations on a regular basis.* *A full impact assessment of the effect that this instrument will have on the costs of business, the voluntary sector and the public sector is available from the Department for Business, Energy and Industrial Strategy, 1 Victoria Street, London.*

Appendix 1 Assessing the dispersibility of radioactive sources and substances

Guidance Appendix 1	1. Operators should use the information in this appendix to help them complete assessments of the dispersal risks associated with the radioactive source(s) or substance(s) they use or keep at their premises. 2. Figure 1 sets out the important questions to which operators should have satisfactory answers to be able to conclude that the radioactive source or substance being assessed is non-dispersible for the purpose of REPPIR (see definition of sealed source and non-dispersible source in regulation 2(1) and paragraphs xxx). 3. The figures should be used as a guide on what an assessment should contain. The Health and Safety Laboratory Research Report FS/99/19 Release fractions for radioactive sources in fires[39] gives further information about radioactive substance dispersibility assessment. *4.* It is the operator's responsibility to consider all accident scenarios that might affect their premises and the possible effect these events might have upon the chemical and physical stability of the radioactive substances they use or keep at their premises. In the case of sealed sources, it is particularly important that operators are confident about the way in which any encapsulation will behave in an accident situation.
Guidance Appendix 1 Figure 1	Figure 1: Dispersibility assessment flow chart.

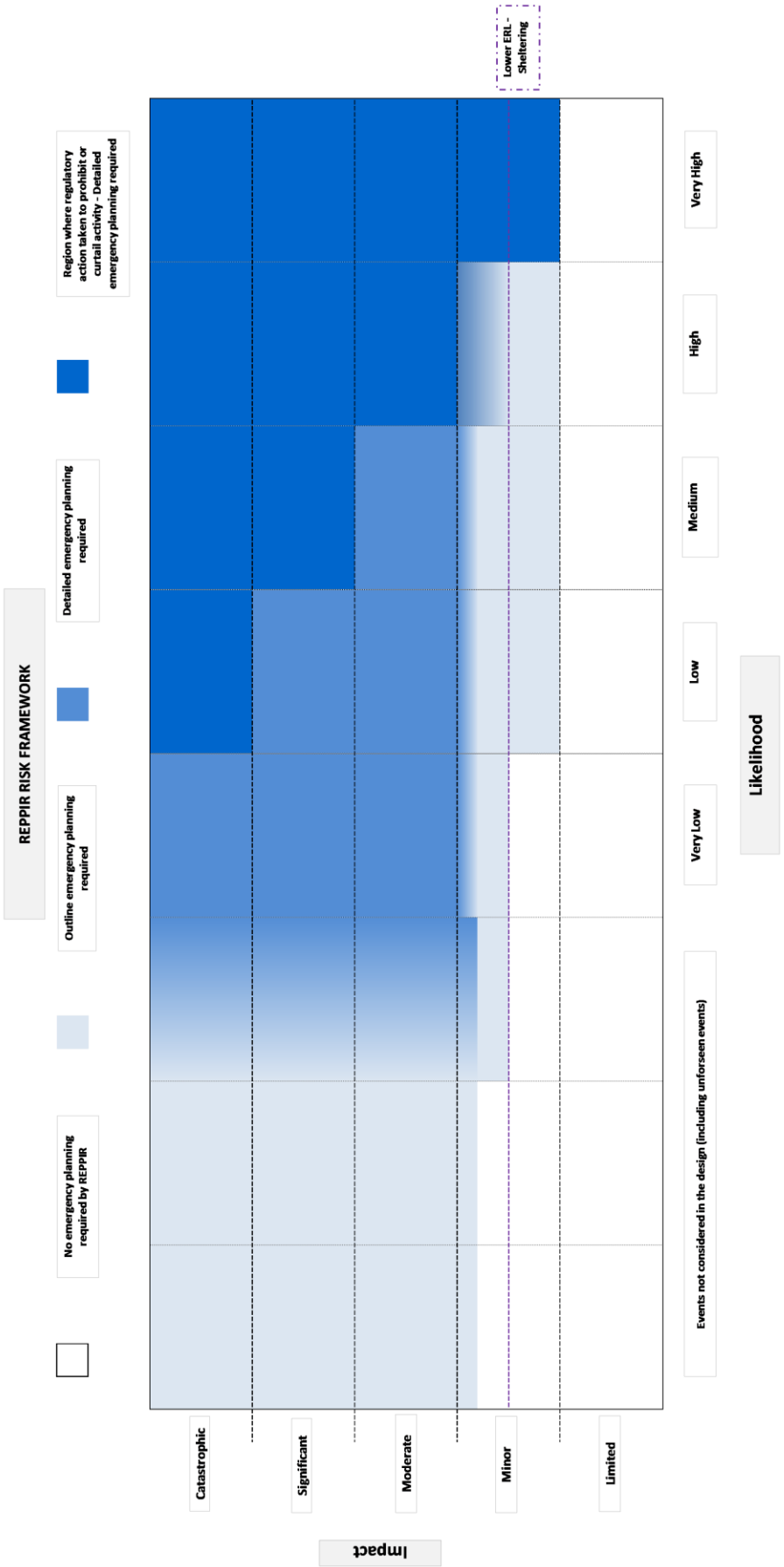


* In any event means in any event or non-routine situation. The impacts from all scenarios should be grouped as per paragraphs xxx of guidance before they are applied to the flow diagram.
** For the purposes of assessing the potential for dispersion of radioactive material, activity levels are compared to the level specified in ISO standard 9978:1992(E) for leaking testing. This standard specifies that when testing sources for leaks, any activity >200 Bq is indicative of a leak. Therefore if the activity is less than 200 Bq, the sealed source is considered to be leaktight. Such low levels of contamination will be local to the area within which the source is kept (for example within the source holder, shielding, or equipment) and this would not normally be considered as 'dispersion' from the source that would lead to significant doses to persons.

Appendix 2 Risk Framework

Regulation 5(1)

Appendix 2 ACOP Figure 2: Risk framework



Impact descriptor	Dose exposure (main quantifier, see table for additional potential factors
Limited	Background radiation levels
Minor	1 mSv - 10 mSv
Moderate	10 mSv - 100 mSv
Significant	100 mSv - 1000 mSv
Catastrophic	1000 mSv or more

Likelihood descriptor	Relative likelihood of occurring in the next 5 years
Events not considered in design (inc. unforeseen)	less than 1 in 20,000
Very low	1 in 20,000 - 1 in 2,000
Low	1 in 2,000 - 2 in 200
Medium	1 in 200 - 1 in 20
High	1 in 20 - 1 in 2
Very High	Greater 1 in 2

Guidance Appendix 2 Figure 3: Impact table

			Descriptors				
			1	2	3	4	5
			Human life (Acute exposure/ Determinstic Effects)	Health & Safety (Cancer induction)	Quality of life	Property	Environment
Impact	A	Catastrophic (Greater than 1Sv)	Death and life changing consequences severe determinstic effects possible	Possibility of life changing consequences because of significant (>5%) increased risk of cancer induction	Complete reconstruction of life activities	Asset value completely lost	Exclusion zones increase and heavy restrictions extended to further distance
	B	Significant (100-1000mSv)	possiblity of moderate deterministic effects	Possibility of life changing consequences increases because of small (0.5-5%) increased risk of cancer induction	Initial reconstruction and continued interruption of normal life activities	Major asset value depreciation	Exclusion zones of environmental areas and heavy restrictions
	C	Moderate (10-100mSv)	No potential for deterministic effects, below threshold dose	Possibility of life changing consequences increases because of very small (0.5%) increased risk of cancer induction	Enforced prevention or interruption of normal life activities	Potential or real asset value depreciation	Restricted or temporary loss of environmental growth or produce
	D	Minor (1-10mSv)	No potential for deterministic effects, below threshold dose	Minimal impacts and unlikely to have life changing consequences.	Potential self-imposed restrictive changes in normal life activities	Assumed asset value depreciation	Reluctance to use environmental areas and produce
	E	Limited (Background ~2mSv)	No potential for deterministic effects, below threshold dose	Normal background	Sustained normal life activities	Asset value sustainable or dominated by market forces	Sustainaned environmental conditions

Appendix 3 Abbreviations

Guidance Appendix 3 Abbreviations

ACOP	Approved Code of Practice
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
Bq / GBq	Becquerel / Giga-Becquerel
BSSD	The Basic Safety Standards Directive 2013 (EURATOM)
CAA	Civil Aviation Authority
CAP 168	Civil Aviation Publication 168 *Licensing of aerodromes*
CCA	Civil Contingencies Act
CDG	The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended 2019)
COMAH	Control of Major Accident Hazards Regulations 2015DGHAR Dangerous Goods in Harbour Areas Regulations 2016
DRF	Dose reduction factor
EASR	Environmental Authorisations (Scotland) Regulations 2018
ERL	Emergency Reference Level
EURATOM	European Atomic Energy Community
FMEA	Failure Mode and Effects Analysis
HAZAM	Hazard Assessment Methodology
HAZOP	Hazard Operability Analysis
HM	Her Majesty's
HSE	Health and Safety Executive
HSWA	Health and Safety at Work Act 1974
IAEA	International Atomic Energy Authority
ICRP	International Commission on Radiological Protection
INES	International Nuclear Event Scale
IRR	Ionising Radiations Regulations 2017
ISO	International Organisation for Standardisation
JESIP	Joint Emergency Services Interoperability Principles
MCA	Maritime and Coastguard Agency
METHANE	Major Incident Declared, Exact location, Type of incident, Hazards Access, Number and type of casualties and Emergency services present and required
MHSWR	Managing Health and Safety at Work Regulations 1999
MOD	Ministry of Defence
MOU	memorandum of understanding
NIA	Nuclear Installations Act 1965

	NNEPRG	National Nuclear Emergency Planning and Response Guidance
	ONR	Office for Nuclear Regulation
	PHE CRCE	Public Health England Centre for Radiation, Chemicals and Environmental Hazards
	PSA	Probability Safety Assessment
	QRA	Quantitative Risk Assessment
	REPPIR	Radiation (Emergency Preparedness and Public Information) Regulations 2019
	RMU	Radiation Monitoring Unit
	RPA	Radiation Protection Adviser
	SOP	Standard Operating Procedure
	SyAP	Security Assessment Principles

References [….To be completed][3]

1 Council Directive 2013/59/EURATOM of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom *Official Journal of the European Union* (17.1.2014), No L13, 1-73.

2 Health and Safety at Work etc Act Ch 37 The Stationary Office 1974 ISBN 0 10 543774

XX The Carriage of Dangerous Goods Regulations 2009, as amended in 2019 (CDG),……

XX: PHE report: 'Derivation of reference values for Schedule 1 of the REPPIR 2019 regulations. Specified quantities of inventory holdings for more than 700 radionuclides'. PHE. 2019 – to be published. Available from PHE Tel: 01235 831600.

XX ISO 9978:1992 Radiation protection - Sealed radioactive sources - Leakage test methods, First edition 1992-02-15.

XX ISO 2919:2014 Radiological protection — Sealed radioactive sources — General requirements and classification

XX *Work with Ionising Radiation. Ionising Radiations Regulations 2017.* Approved Code of Practice and guidance L121 HSE Books 2018 ISBN 978 0 7176 6662 1

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XX REPPIR consequence assessment methodology. Public Health England (PHE) Contract report CRCE-RAD-001-2018. PHE 2019.

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