



ONR GUIDE			
THE CARRIAGE OF DANGEROUS GOODS AND USE OF TRANSPORTABLE PRESSURE EQUIPMENT REGULATIONS 2009: EMERGENCY PLANNING AND NOTIFIABLE EVENTS			
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1 INTRODUCTION

- 1.1 The carriage of dangerous goods by road and rail in Great Britain, including radioactive materials, is regulated by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (Statutory Instrument 2009 No. 1348), also referred to as CDG 2009*.
- 1.2 CDG 2009 Regulation 32A makes it an offence for a person not to comply with any relevant provision as they apply to the civil carriage of class 7 goods.
- 1.3 Regulation 5 requires that carriage of dangerous goods be in accordance with ADR (the European Agreement concerning International Carriage of Dangerous Good by Road) and RID (the Regulation concerning the International Carriage of Dangerous Goods by Rail).
- 1.4 Regulation 24 requires compliance with Schedule 2 of CDG 2009 which, in turn requires that an adequate emergency plan[†] is produced, where a radiation emergency may occur during transport or prior to the carriage of a package and that notifiable events, where they occur, are reported to the relevant authorities listed therein.
- 1.5 Further information is contained in Sections 5, 6 and 7 of this guide.
- 1.6 The Carriage of Dangerous Goods (Amendment) Regulation 2019 (Statutory Instrument 2019 No. 598) substituted the previous Schedule 2 information with a new, more detailed and explicit schedule related to radiation emergencies (Part 1) and notifiable events (Part 2). The new requirements of Regulation 24 and Schedule 2 came into force in Great Britain on 21 April 2020.
- 1.7 ONR enforces compliance with CDG 2009, and with the arrangements made under them, to judge the suitability of the arrangements made and the adequacy of their implementation. To support inspectors undertaking compliance inspections, ONR produces a suite of guides to assist inspectors to make regulatory judgements and decisions in relation to the adequacy of compliance, and the safety of duty holder activities. This inspection guide is one of a suite of documents provided by ONR for this purpose.

2 PURPOSE AND SCOPE

- 2.1 This guide has been prepared to facilitate a sound basis and consistent approach to the inspection of CDG 2009 Regulation 24 and Schedule 2 and to provide guidance to inspectors whilst inspecting a duty holder's arrangements in this particular area.
- 2.2 A duty holder will require some level of emergency procedure, whether this be the requirements specified in CDG 2009, or contingency plans specified in the Ionising Radiations Regulations 2017 (IRR 2017) is for the duty holder to determine and implement ^{ADR 1.7.1 also refers}.

* CDG refers to 'emergencies' and ADR / RID refer to 'incidents' or 'accidents'

† CDG refers to 'emergency plan' and ADR / RID refer to 'emergency procedures' and 'emergency arrangements' respectively

- 2.3 The guidance is for use by inspectors in ONR when making a judgement regarding the adequacy of a duty holder's arrangements concerning an emergency plan and notifiable events as required by CDG 2009.
- 2.4 This guidance should not be considered to be either comprehensive or mandatory. Inspectors should apply discretion, experience and judgement when deciding what aspects of the duty holder's arrangements for CDG 2009 are to be inspected. These matters are covered in individual inspectors' inspection plans, which take account of priorities established by the relevant ONR division.
- 2.5 A compliance inspection of a nuclear licensed site may be topic specific (such as an inspection of emergency arrangements under Licence Condition 11), however an inspection of other, non-nuclear, duty holders is likely to cover a range of topics. Some aspects (eg documentary information) may not necessarily be inspected at the premises.
- 2.6 The Guide is set out in sections, as below:
- Section 3: Relationship to other relevant legislation
 - Section 4: Relationship to IAEA Safety Standards
 - Section 5: The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG 2009)
 - Section 6: Guidance on the Inspection of Arrangements and their Implementation
 - Section 7: Guidance on Notifiable Events
 - Section 8: Further Reading
 - Section 9: Abbreviations and Terminology
- 2.7 Where relevant, this Guide refers to published non-statutory guidance found on ONR's website at www.onr.org.uk/transport/guidance.htm. Specifically, it refers to the following:
- Guidance on Emergency Planning and Notification
 - Five Steps to Emergency Planning
- 2.8 Appendix A of this Guide provides the content of CDG 2009 Schedule 2 in its entirety. This is to assist inspectors in their understanding and ease of reference.

3 RELATIONSHIP TO OTHER RELEVANT LEGISLATION

Ionising Radiations Regulations 2017

- 3.1 CDG 2009 provides a link between it and the requirements of IRR 2017. Schedule 2 brought into effect by Regulation 24 is clear in this. In particular, the requirements within Schedule 2 paragraphs 1, 2 and 3.
- 3.2 CDG 2009 brings into force the requirements of both the European Agreement concerning International Carriage of Dangerous Good by Road (ADR) and the Regulation concerning the International Carriage of Dangerous Goods by Rail (RID). These are two of the dangerous goods modal regulations.

3.3 Further information on ADR and RID, including the texts, can be found at www.unece.org.

4 RELATIONSHIP TO IAEA SAFETY STANDARDS

4.1 The International Atomic Energy Agency (IAEA), with support from its Member States, produces Regulations for the Safe Transport of Radioactive Materials (SSR-6), which is subsequently considered by UNECE and incorporated into the modal regulations, eg ADR and RID.

4.2 In addition, IAEA produces the following safety standards and guidance in regard to transport of radioactive materials:

- Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material, SSG-26
- Schedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material, SSG-33
- The Management System for the Safe Transport of Radioactive Material, TS-G-1.4
- Radiation Protection Programmes for the Transport of Radioactive Material, TS-G-1.3
- Security of Radioactive Material in Transport, Nuclear Security Series No. 9

4.3 For more information on these publications, visit www.iaea.org/resources/safety-standards.

5 THE CARRIAGE OF DANGEROUS GOODS AND USE OF TRANSPORTABLE PRESSURE EQUIPMENT REGULATIONS 2009

Introduction

- 5.1 Under CDG 2009, if a duty holder determines the requirement for one, an adequate emergency plan is required before the civil carriage of class 7 goods by road and rail in Great Britain commences CDG 2009 Regulation 24 Schedule 2 paragraph 3.
- 5.2 However, CDG 2009 does not require an emergency plan for **all** radioactive material that is transported. As the enforcing authority or Competent Authority for Class 7 of CDG, the ONR decides whether a duty holder has justified that an emergency plan is not required.
- 5.3 The duty holder (consignor or carrier in the case of CDG 2009) should perform a suitable and sufficient radiation risk assessment to determine whether a radiation emergency may arise or not.
- 5.4 If the duty holder's assessment reveals that a radiation emergency may arise, then an emergency plan is required by CDG 2009. The plan, reviewing and testing thereof should be a proportionate, graded approach taking account of reasonably foreseeable hazards present during the transport operation. Transport comprises all operations and conditions associated with, and involved in, the movement of radioactive material. These include the design, manufacture, maintenance and repair of packaging, the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of loads of radioactive material and packages. These activities are all subject to regulation under CDG 2009.

The purpose of CDG 2009

- 5.5 Regulation 5, in essence, requires that carriage of dangerous goods is to be in accordance with ADR or RID, as applicable. ADR / RID 1.7.1.2 states that the objective of ADR or RID is to establish requirements that shall be satisfied to ensure safety and to protect persons, property and the environment from the effects of radiation in the carriage of radioactive material. This protection is achieved by requiring:
- (a) Containment of the radioactive contents;
 - (b) Control of external radiation levels;
 - (c) Prevention of criticality;
 - (d) Prevention of damage caused by heat.
- 5.6 These requirements are satisfied firstly by applying a graded approach to:
- contents limits for packages (including unpackaged radioactive materials) and conveyances, and
 - performance standards applied to package designs depending upon the hazard of the radioactive contents.
- 5.7 Secondly, they are satisfied by imposing conditions on:
- the design and operation of packages; and

- the maintenance of packaging, including a consideration of the nature of the radioactive contents.
- 5.8 Finally, they are satisfied by requiring administrative controls, including, where appropriate, approval by competent authorities.
- 5.9 Regulation 24 and Schedule 2 essentially require the duty holder to:
- (a) consider whether a radiation emergency may arise; and if so,
 - (b) make and implement adequate arrangements to enable personnel, both involved in and dealing with a radiation emergency during transport, to do so in a safe and proportionate manner;
 - (c) review and test those arrangements;
 - (d) provide adequate information, instruction and training to employees involved in the emergency; and
 - (e) provide adequate information to assist in the recovery thereafter.
- 5.10 The purpose of having an emergency plan, before transport takes place, is to prevent or mitigate the consequences should a radiation emergency occur during transport. Having a plan in place should also ensure that certain information about the emergency is shared with relevant authorities.
- 5.11 Duty holders are required to comply with these Regulations. How this compliance is achieved is for the duty holder to decide, unless the Regulations provide specific requirements. ONR must judge the adequacy of this compliance. It carries out this function by compliance inspection, and this guide should be considered when assessing the adequacy of emergency plans and their link to the duty holder's radiation risk assessment for transport operations.

Overarching requirements of the Regulations

- 5.12 The relevant regulatory requirements concerning the civil carriage of class 7 goods by road and rail in Great Britain are set out in Statutory Instrument 2009 No 1348 and subsequent amending Regulations.
- 5.13 The CDG 2009 regulations themselves, as made, are available on the internet at www.legislation.gov.uk/uksi/2009/1348/contents/made.
- 5.14 Amendment regulations have been made on two occasions since 2009, in 2011 and 2019, see:
- (a) www.legislation.gov.uk/uksi/2011/1885/made/data.pdf; and
 - (b) www.legislation.gov.uk/uksi/2019/598/made/data.pdf.
- 5.15 Inspectors should refer to [Westlaw UK](#) for the most current, consolidated version of CDG 2009, which will include all current amendments.
- 5.16 The relevant expressions used in the CDG 2009 regulations are defined in Regulation 2 and are not repeated here. Inspectors should note that expressions defined in ADR, RID or ADN[‡] and not defined in CDG 2009, have the same meaning

[‡] ADN is the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway.

as those within ADR, RID or ADN. Similarly for the Transportable Pressure Equipment Directive. The Table in Regulation 2 shows those expressions defined in CDG 2009.

- 5.17 Regulation 3(a) states that for the purposes of CDG 2009, the scope of ADR, RID and ADN is deemed to include national as well as international carriage. Regulation 4 then goes on to state that CDG 2009 applies in relation to the carriage of dangerous goods by road and rail and, to a limited extent, inland waterway.
- 5.18 Regulation 5 requires that no person is to carry dangerous goods, or cause or permit dangerous goods to be carried, where that carriage is prohibited by ADR or RID, including where that carriage does not comply with any applicable requirements of ADR or RID. Therefore, inspectors should consult ADR or RID in preparing for and carrying out their compliance inspection. Regulation 5 brings into force the requirements of ADR and RID for transport within Great Britain, unless stated otherwise in CDG 2009.

Requirements specific to radiation emergencies and notifiable events

- 5.19 CDG 2009 Regulation 24 (Radiation emergencies and notifiable events) states:

- (1) *This part applies in relation to the carriage of class 7 goods only.*
- (2) *Schedule 2 makes provision in conjunction with radiation emergencies and notifiable events.*
- (3) *But this Part does not apply to carriage by vehicles or wagons belonging to or under the responsibility of one of the armed forces.*

- 5.20 Regulation 24 ^{Regulation 24(2)} brings into force the provisions within Schedule 2 of the regulations. The following discusses the most pertinent paragraphs of Schedule 2 related to the contents of an emergency plan, not the entirety of the Schedule.

- 5.21 Schedule 2 Parts 1 and 2 are replicated at the back of this Guide for ease of reference in Appendix A.

- 5.22 Inspectors should ensure they are familiar with Schedule 2 before conducting an inspection, along with the ONR guidance on emergency planning and notifiable events available at:

www.onr.org.uk/transport/guidance.htm

CDG 2009 Schedule 2

- 5.23 Paragraph 1 provides definitions of terms used within Part 1 of Schedule 2. Of note, the paragraph defines a “radiation emergency”:

“radiation emergency” means a non-routine situation or event arising during the carriage of class 7 goods 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 one or more of the following—*

- (i) *human life;*
- (ii) *health and safety;*
- (iii) *quality of life;*
- (iv) *property;*
- (v) *the environment;*

5.24 A “duty holder” within Schedule 2, is:

- (a) a consignor, and/or
- (b) a carrier.

5.25 Paragraph 1(3) also clarifies that:

“...a person assists in the handling of a radiation emergency if the person takes any steps that it is reasonable to take in the prevailing circumstances to reduce or prevent exposure.”

5.26 For information, “prevailing circumstances” are defined in Paragraph 1(4).

5.27 Paragraph 2 (Evaluation and risk assessment) provides a clear link between CDG 2009 and IRR 2017.

5.28 Regulation 8 of IRR 2017 (Radiation risk assessment) requires that the employer (duty holder) makes a suitable and sufficient assessment of the risk to any employee and other person for the purpose of identifying the measures the employer needs to take to restrict the exposure of that employee or other person to ionising radiation.

5.29 An employer must not carry out any work, which includes transport, unless it has made an assessment sufficient to demonstrate that all hazards with the potential to cause a radiation accident have been identified and the nature and magnitude of the risks to employees and other persons arising from those hazards have been evaluated.

5.30 Consistent with IRR 2017, ONR’s guidance on [transport emergency planning](#) identifies an effective dose to an ‘employee’ or any other person involved in an incident, of 1 mSv over a period of one year following a transport emergency (dose consequences of a radiation accident during transport). Above this, an emergency plan is required in accordance with the requirements of CDG 2009 Schedule 2.

5.31 Inspectors should note that the definition of radiation accident is very similar to that of a radiation emergency - the term used in the carriage of class 7 goods. In IRR 2017, a radiation accident is defined as:

“an accident where immediate action would be required to prevent or reduce the exposure to ionising radiation of employees or any other persons.”

5.32 Paragraph 3 of CDG 2009 Schedule 2 lists the issues an emergency plan should both take into account ^{paragraph 3(3)} and contain ^{paragraphs 3(4) and 3(5)}.

5.33 The emergency plan must also be drawn up having regard to the principles and purposes set out in paragraph 4.

- 5.34 If a duty holder is to transport class 7 goods on more than one occasion, then paragraph 5 sets out the requirements on each duty holder to review and test the plan, together with what a review and test of the plan must consider.
- 5.35 Paragraphs 7, 8 and 9 deal with doses to those involved in a radiation emergency, covering exposures, disapplication of dose limits and reference levels. These should be addressed in the emergency plan.
- The requirements of paragraph 7 only apply where a duty holder has identified, as a result of the risk assessment undertaken to comply with paragraph 2, that doses in excess of the relevant dose limits in the 2017 Regulations (or IRR 2017) for employees aged over 18 years of age could be incurred. If relevant, appropriate provision should be made in the emergency plan.
 - Paragraph 8 provides for the explicit disapplication of dose limits that are contained within IRR 2017 where necessary, to respond in preventing the occurrence of a radiation emergency or to mitigate the consequences of a radiation emergency. The disapplication is explicit to remove any doubt that the limits appearing in IRR 2017 do not apply to emergency exposures meeting the relevant criteria. The paragraph also places constraints on the maximum dose that an emergency worker may receive and introduces a structure of controls for optimisation below those levels.
 - Paragraph 9 sets out the requirements for emergency plans to prioritise the keeping of whole body effective doses below a 100 mSv maximum reference level, or for a local authority to prescribe a specific reference level itself. These specific reference levels may be related to the responders involved in a radiation emergency.
- 5.36 Paragraph 10 requires that any package that has been involved in a radiation emergency, must be examined to ensure it still meets the requirements of the regulations before it is either carried or caused to be carried.
- 5.37 ONR guidance to non-nuclear duty holders [see www.onr.org.uk/transport/emergency-planning-notification-class-7.pdf] clarifies that there are no set contents or format for the certificate. Therefore, the inspector must judge the adequacy of the duty holder's arrangements in regards to:
- Is the certificate clear and does it contain a clear and unambiguous statement that the consignor confirms that the package is compliant with the relevant requirements of CDG 2009 and is suitable for onward carriage?
 - Is the certificate issued by the consignor itself, not a representative?
 - Is the certificate in a permanent form ie it cannot be changed / doctored and can be stored for recording purposes?

6 GUIDANCE ON THE INSPECTION OF ARRANGEMENTS AND THEIR IMPLEMENTATION

General

- 6.1 Part 6 of this Guide is to assist inspectors in judging the adequacy of a duty holder's arrangements. This section is neither exclusive nor exhaustive and will be subject to review and revision in light of operational experience. It does, however, provide aspects of CDG 2009 that can be examined during routine inspections of emergency arrangements.
- 6.2 The requirement for an emergency plan should result from the duty holder's assessment of the risks during transport operations Schedule 2 paragraph 2. Guidance is provided for duty holders on ONR's website www.onr.org.uk/transport/guidance.htm. Concerning the assessment of accident situations during transport, CDG 2009 requires all accident situations to be assessed, whether unlikely or not. Such areas for consideration could include:
- Road traffic collisions, particularly where goods are carried on busy A-roads and motorways where heavy goods vehicles are likely to also travel.
 - Incorrectly assembled packages, where the duty holder cannot rely upon a package ensuring the containment of its contents or the shielding provided by the package, particularly during an accident ie road traffic collision.
 - Incorrectly maintained packages, where the duty holder cannot rely upon engineered systems to contain or shield, especially during an accident.
 - Theft of a package where the thief may attempt to open packages and expose contents or leave exposed contents in a public place afterwards.
 - Vehicular fire where packages may be damaged or cause inhalation risk and require emergency services to tackle such fires.
 - Recovery of packages post-incident where careful management of packages may be required, requiring persons to be in close proximity for longer than normal periods. What are the potential dose consequences?
- 6.3 The above list is not exhaustive but provides inspectors with information on what types of accidents and their assessment, may be relevant.
- 6.4 The conclusion of the radiation risk assessment concerning the need for an emergency plan should be specified with accident doses identified to justify the conclusion.
- 6.5 CDG 2009 Schedule 2 paragraph 3 requires that the duty holder (consignor and carrier), where necessary ensures that an adequate emergency plan is made. The plan shall 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 a radiation emergency identified within its radiation risk assessment for transport. If used on more than one occasion, they must review and, whenever necessary, revise the emergency arrangements and must ensure that at suitable intervals they are tested.

- 6.6 The purposes of an emergency plan are stated within the Regulations ^{Schedule 2 paragraph 4⁽²⁾}, but fundamentally it is to protect people, property and the environment resulting from the release of ionising radiation during transport.
- 6.7 If duty holders have generic models for such arrangements then it is for the duty holder to justify any deviation from the models. Any such deviations must comply with the requirements of CDG 2009.
- 6.8 Inspectors should check that arrangements are in place and procedures have been made to demonstrate compliance with the requirements of CDG 2009 for an emergency plan setting out emergency arrangements. If used on more than one occasion they shall include for the review and revision of the emergency plan and that at suitable intervals the arrangements are tested.
- 6.9 Check that these arrangements are implemented adequately, as set out in the remainder of this section.
- 6.10 ONR Transport Competent Authority has produced non-statutory guidance for duty holders, which can be found on the ONR website at the address below. Inspectors should ensure they are aware of this guidance.

www.onr.org.uk/transport/emergency-planning-notification-class-7.pdf

6.11 **Important notes for inspectors:**

- Emergency plans are in addition to the Instructions in Writing (IIW) required by ADR / RID 5.4.3.
- If a duty holder requires both an emergency plan and a contingency plan under CDG 2009 and IRR 2017 respectively, then it may be practicable for it to combine the requirements of both into one plan to avoid significant duplication.

6.12 Review the relevant procedures to establish:

- (a) **validity** ie have the requirements of CDG 2009 been met and ONR guidance for duty holders (see link above) been utilised;
- (b) whether **any changes** have been made since the last review;
- (c) where applicable, whether the **identified responsible persons** are correct and whether there are any omissions; and
- (d) **whether instructions, methods and management system requirements claimed in procedures have been followed** and whether any changes that have been made have been correctly incorporated and validated.

Preparation and contents of the arrangements

- 6.13 If the evaluation and risk assessment required by Schedule 2 paragraph 2 shows that a radiation emergency may arise, the duty holder(s) must make adequate emergency plans to prevent or mitigate the consequences of an emergency.
- 6.14 Inspectors should review the radiation risk assessment, which should be the method by which the duty holder determines whether or not a radiation emergency may occur, and determine whether or not the assessment (and conclusion) is reasonable.

- 6.15 If an emergency plan is not required, then the duty holder must still make contingency plans under IRR 2017 for those accidents deemed reasonably foreseeable ^{see IRR 2017 Regulation 13(1)}.
- 6.16 The factors that need to be taken into account when preparing an emergency plan have been made more explicit in Schedule 2 of the Regulations and now specify the information that must be included ^{see Schedule 2, Part 1, paragraph (3)(5)}.
- 6.17 This applies to all radiation emergencies that are identified, however the emergency plan should be a proportionate, graded approach taking account of reasonable hazards present during the transport operation. Such considerations could include, but are not necessarily limited to:
- the radioisotope(s) being transported, the physical form of the material, whether it is special form, the amount of radioactive material being transported (eg in Becquerels), and the potential effects on persons and on the environment,
 - the number, frequency and type of packages being transported (excepted packages, Industrial packages, Type A packages etc.), whether the material is unpackaged, etc.,
 - the security requirements of the consignment, as per ADR / RID 1.10,
 - whether High Consequence Dangerous Goods are present (as defined in ADR / RID 1.10.3.1) and, if so, whether an associated security plan exists (ADR / RID 1.10.3.2),
 - whether the radioactive materials have any subsidiary risks, or other classes of dangerous goods also being consigned have a class 7 subsidiary risk,
 - the mode(s) of transport and associated intermodal transfers,
 - whether stops (breaks, overnight etc.) and/or storage in transit are undertaken,
 - whether adverse weather conditions are likely,
 - the population densities along the route (ie areas to potentially avoid),
 - whether rush hour traffic conditions are likely, and
 - reasonably foreseeable incidents and consequences (for example: mechanical breakdown, theft of the conveyance or contents, vehicular or other impacts, fire, loss of containment, loss of shielding, loss of criticality control, incapacitated driver).
- 6.18 These considerations should be made when meeting the requirements of points (c) and (d) of Schedule 2 paragraph 3(5).
- 6.19 Points for inspectors to consider during an inspection are:
- (1) Has a proportionate, graded approach taking account of the reasonably foreseeable hazards present during the transport operation been applied?
 - (2) Have all the relevant physical attributes of the radioactive materials, package types, frequency of carriage etc. been included?
 - (3) Have the other factors such as avoiding carriage during adverse weather (high / low temperatures may affect package performance, or conveyance performance), population densities and traffic conditions been considered, for example will the carriage of radioactive materials pass a school on a week day at 15:30?

- (4) Is this the most appropriate route, or could it be consigned at another time / via another less populated route?
 - (5) Have the other relevant considerations of paragraph 6.17 **Error! Reference source not found.** of this Guide been factored into the process adequately?
 - (6) Do the security arrangements adequately address the requirements of ADR / RID 1.10.1 (general) and 1.10.2 (training)?
 - (7) If intermodal transfers are applicable, has consideration been given to the additional potential risks of such activities (out of hours handover arrangements, unavailability of the onward conveyance, etc.) and how are these to be mitigated against?
 - (8) Is storage in transit covered, if applicable? What arrangements are in place for the plan to cover this activity?
 - (9) Does the duty holder park vehicles, unsupervised, and if so, do they use the hierarchy of locations set out in ADR 8.4.1?
 - (10) Are High Consequence Dangerous Goods (HCDG) being transported[§], and if so, do arrangements to address the provisions of ADR / RID 1.10.3 (including the requirement for a security plan) exist? Consideration should be given to the carriage of other HCDG with class 7 dangerous goods, which themselves are not HCDG.
- 6.20 ONR recommends that the appropriate contact telephone number for the reporting of incidents is included in the plan. These should be checked by the inspector to ensure they align with the information on ONR's website:
- www.onr.org.uk/notify-onr.htm
- 6.21 If not included, are the arrangements in place sufficient to ensure contact could be made in the event of a radiation emergency or notifiable event?
- 6.22 Further areas for consideration by inspectors are:
- (1) Are the types of incidents that the plan covers (for example mechanical breakdown, theft of the conveyance or contents, impact, fire, incapacitated driver) credible and do they consider all reasonable incident scenarios?
 - (2) Does the plan address the potential for loss of containment, loss of shielding, loss of criticality control (including changes in geometry / containments), increased external radiation levels? Does the plan consider the potential structural vulnerabilities of the package?
 - (3) Are the duties of drivers, escort commanders, masters, carriers and consignors in the event of the occurrence of a radiological emergency incorporated into the plan? Is it clear who should do what? Are all activities covered (ie are there no gaps)?
- 6.23 Specifically in regards to drivers:

[§] This is also referred to as High Consequence Radioactive Material (HCRM)

- (1) Is the information within the plan(s) adequate, clear, concise and readily available to the driver? The driver may be in shock immediately after the incident happens, they need the information to be in a form that needs little (or no) interpretation.
- (2) Are all the actions to be taken by the driver identified in the emergency plan? When carriers employ drivers who speak English as a second language, do they assess their drivers' competency in speaking and reading English for the consignment, and does the carrier have a mechanism for ensuring the emergency arrangements are in the languages deemed necessary (see ADR / RID 5.4.1.2.5.2 (c))?
- (3) What immediate notifications must be made by the driver and by what means? Is this adequate?
- (4) What information must the driver give to the emergency responders, as a minimum? Is this clear, suitable and sufficient?
- (5) How will the driver minimise their dose uptake? Is all equipment identified in the emergency plan as being necessary carried on the conveyance at all times (including PPE, RPE, equipment specified in approvals and other specialist items) or does the driver only carry these items when certain packages are being transported? Is it available to the driver, in working order, in date, and is the driver competent in their use? Is a record of these checks retained?
- (6) How will the driver identify a leaking / breached package or spill of unpackaged materials, and what actions are to be taken in the event of a leaking / breached package or spill? What actions will the driver take to prevent the situation from getting worse (for example, control of contamination, minimisation of dose uptake, control of fire / heat, use of equipment, RPE and PPE)?
- (7) How will the driver seek to minimise the risks to the public and the environment at the scene, including physical means and provision of information / warnings, and are these adequate? Is all the relevant equipment identified in the emergency plan (including PPE, RPE and specialist items) and available to the driver, in working order as per item (5) above?
- (8) What actions does a driver need to take ensure the radioactive materials remain secure, without compromising the emergency response? For example, what to do if the conveyance is damaged to the extent that it is vulnerable (ie broken windows, doors not able to lock). Does the conveyance need to remain locked if driver needs to leave the conveyance?
- (9) If the driver is incapacitated how will the emergency responders be made aware of the risks associated with the consignment and how will the emergency services contact the consignor and/or the owner of the consignment?

6.24 More generally:

- (1) What other notifications are required (eg to ONR using the INF1 form, unless an alternative is agreed by ONR) and is the responsible person(s) identified?
- (2) How will expert advice be obtained (DGSA, RPA or other)?
- (3) Is DGSA and/or RPA advice available during operational hours (which may be 24 hours a day, 7 days a week)?

- (4) Do arrangements exist to ensure all equipment needed at short notice is available, including how will it be mobilised?
 - (5) Does the emergency plan address all the other relevant points listed in paragraph 6.2 of this Guide? Are any other relevant considerations given due regard?
 - (6) Has due regard been made to the principle that any planned intervention (in relation to the emergency), its form, scale and duration, and that they are justified, comply with the dose limits in Schedule 3 of the Ionising Radiations Regulations 2017 and section 58 of the Health and Social Care Act 2012. This could be achieved through advice given by their RPA.
 - (7) Does the duty holder intend to implement paragraph 8 (Disapplication of dose limits) or paragraph 9 (Reference levels)? The radiation risk assessment should contain the relevant justifications.
 - (8) What actions are to be taken by the carrier? What assistance is made by the carrier in connection with the emergency?
 - (9) What actions are to be taken by the consignor? What assistance is made by the consignor in connection with the emergency (for example, notifications to be made to the emergency services, relevant local authority and the GB Competent Authority), including notification of initiation of the emergency arrangements?
 - (10) How do the consignor and carrier ensure that an adequate emergency plan exists? What arrangements ensure that one doesn't assume that the other has an emergency plan covering the carriage of the radioactive materials?
 - (11) Where a consignor and carrier have separate plans, the inspector should confirm that there are arrangements in place to ensure that the plans do not conflict.
 - (12) Where outside assistance is required during a radiation emergency, are contracts in place for this support and the scope of the contractor's participation agreed?
- 6.25 Does the emergency plan identify who needs to be aware of and trained in the emergency arrangements?
- (13) Are all those likely to be involved identified (including office based staff)?
 - (14) What training will be provided (general awareness, role specific, and/or package specific), to what level of competence, how often, are any refresher periods appropriate and is this adequate?
 - (15) Is training recorded and retained? Is the training of individuals up to date?
- 6.26 Are the arrangements for the clean-up phase of the incident (including recovery of damaged packaging, additional approval and certification requirements required for onward carriage) adequate?
- (16) Do they consider all reasonably foreseeable scenarios?
 - (17) Will support be required for additional services in relation to clean-up phase? Are any associated contractual arrangements in place for this support (or have been

given due consideration as a minimum), and the scope of the contractor's participation agreed?

(18) Does the duty holder have arrangements in place for the production and issuance of a handover report to the relevant local authority?

6.27 Are the media likely to be interested in the incident? If yes, how will this interface be handled without compromising the incident response?

6.28 Have reasonably foreseeable circumstances, for example, changes in regulations, a significant change in transport operations, changes in contractor support etc. been identified as a trigger(s) for revision of the emergency plan?

Review and testing of the arrangements

6.29 CDG 2009 Schedule 2 paragraph 5(1) requires that if an emergency plan is to be used in relation to carriage on more than one occasion, each duty holder must review and test the plan at suitable intervals, not exceeding three years.

6.30 **Important note for inspectors:** There is no provision within CDG 2009 for ONR to extend the time between tests beyond the maximum three year period.

6.31 Reviewing the emergency plan should ensure that the requirements Schedule 2, Part 1, paragraph 3 continue to be met and that the plan still aligns with the principles and purposes identified in Schedule 2 of CDG 2009.

6.32 The duty holder should record its review, even in the case where this results in no revisions being made or planned as a result.

6.33 ONR expects that emergency plans and testing thereof, for the carriage of a small number of excepted packages on a short road journey once or twice a year would significantly differ to a plan for multiple Type B packages being transported on a daily or weekly basis. For example:

- A consignment of an excepted package (steel drum) of solid waste: The plan should include details of how the driver, consignor and/or carrier would deal with an incident whereby the drum has been damaged in transit. The plan should consider the hazards and where it is deemed necessary to either overpack the damaged drum or transfer the contents to an undamaged drum. Competent persons should be identified to undertake such activities and the plan should contain adequate information and instruction or details of where these exist.
- A consignment of a Type A package of radioactive liquid (for example, radiopharmaceuticals) and the package is a cardboard outer with shielded inner tubes containing a vial: The plan should include details of how the driver, consignor and/or carrier would deal with an incident whereby the package has been dropped or damaged in transit. The plan should consider the hazards and how to recover the package and contents from the scene, taking due note of the radiation dose rate(s), half-life of the products and measures required to minimise risks to staff and the public. The need for spill kits and suitable packages for use in the recovery operation should be considered. The plan should contain adequate information and instructions or detail where these exist, including simple advice for

the driver and emergency services at the scene. Where a third party will be required to provide assistance in the clean-up and recovery operation there should be clear evidence that the duty holder has any associated contractual arrangements in place for this support (or have been given due consideration as a minimum), and the scope of the contractor's participation agreed.

- 6.34 The Regulations (CDG 2009) are specific regarding what must be included in a review of emergency plans. This is:
- (a) changes occurring in the carriage of packages to which the plan relates;
 - (b) changes within the emergency services concerned;
 - (c) changes to the RPA or DGSA;
 - (d) new knowledge or guidance, whether technical or otherwise, concerning the response to radiation emergencies;
 - (e) any material changes to the assessment on which the plan was based since it was last reviewed or revised; and
 - (f) any relevant information derived from a report or review of the consequences of any radiation emergency.
- 6.35 Inspectors should determine whether or not the above have been included in a review of the emergency plan and what, if any, changes resulted.
- 6.36 The testing regime and frequency of testing should be proportionate to the risks involved in the transport operation. The plan should be tested at least annually, unless an adequate justification for less frequent testing is made.
- 6.37 Annual testing of the plan over a three-year period could be used to test different aspects of the plan over the period and demonstrate compliance with the requirements for testing.
- 6.38 What type(s) of test is (are) to be undertaken and is the justification for selecting the testing regime adequate?
- 6.39 Example of types of test and ONR expectations:
- (a) One-to-One Discussion: discussion of the actions to be taken in the event of an emergency for their specific role.
 - Do the individuals understand the actions they are to take in the event of an emergency for their specific role?
 - Are the points for discussion relevant?
 - Are there any omissions?
 - It is unlikely that this will form the totality of the testing of the emergency arrangements, but a subset of a more comprehensive testing regime.
 - Does a more comprehensive testing regime exist?
 - (b) Drill: roll call of key personnel, dialling relevant telephone numbers for accuracy, check functionality and availability of emergency equipment.

- Does this involve a roll call of key personnel, dialling relevant telephone numbers for accuracy, checking functionality and availability of emergency equipment? If not, is this justified and are any other equivalent activities undertaken?
 - This is unlikely to form totality of the testing of the emergency arrangements other than for carriage of excepted packages or unpackaged surface contaminated objects (SCO-I). In all other cases it is likely that this will be a subset of a more comprehensive testing regime.
 - Does a more comprehensive testing regime exist?
- (c) Desktop: presence of key personnel, dialling relevant telephone numbers for accuracy, check functionality and availability of emergency equipment, and discussion of the actions to be taken in the event of an emergency in the order that they are likely to occur.
- Are all key personnel present?
 - Does the test involve dialling relevant telephone numbers for accuracy, check functionality and availability of emergency equipment, and discussion of the actions to be taken in the event of an emergency in the order that they are likely to occur? If not, is this justified and are any other equivalent activities undertaken?
 - This type of test is most likely for, but not limited to, the carriage of Industrial packages (IP1 & IP2), and Type A packages.
- (d) Full or partial simulation: with conveyance, packaging, driver, emergency equipment, emergency services and emergency response team present.
- Is this performed with the conveyance, packaging, driver, emergency equipment, emergency services and emergency response team present?
 - This type of test is most likely for, but not limited to, the high volume carriage of Industrial packages (IP2 & IP3), Fissile, Type A, Type B, Type H(U), H(M), and/or Type C packages.

6.40 In judging the adequacy of the test scope, the inspector should consider the following:

- (1) Is the testing regime and frequency of testing proportionate to the risks involved in the transport operation? The scenario should be rooted in the current safety case / safety justification for the package.
- (2) Do the test(s) consider both predicted incident scenarios and further scenario development? The scenario should ideally contain the unexpected making the emergency team think rather than just running through a standard set of responses.
- (3) Is the plan tested at least annually or has an adequate justification for less frequent testing been made?
- (4) Are records of any tests made within 28 days and are they kept for a reasonable period thereafter (ONR judges this to be at least five years)?
- (5) Have lessons from the consignor or carrier's previous emergency exposure situations been taken into account and has the duty holder taken into account

any learning published by the UK from its participation in national or international exercises?

- (6) Have lessons learned from the tests been adequately incorporated into the plan? Is this learning evident in subsequent test records?
- 6.41 The National Arrangements for Incidents involving Radioactivity (NAIR) must not be claimed by the duty holder as being (wholly or in part) their plan.
- 6.42 Consignors may be members of the RADSAFE scheme which provides mutual support to its members. Membership of RADSAFE alone does not constitute an adequate emergency plan, particularly as a response cannot be guaranteed. The provision of RADSAFE support must dovetail with the other arrangements to form a coherent set of emergency arrangements.
- 6.43 Alternative tests may be acceptable, however in all cases a sufficient justification of their suitability should be made.
- 6.44 The testing regime should be such that all of the aspects of the response plan can be tested. Where applicable, phone numbers should be tested, any cordon / barrier equipment should be erected, electrical equipment should be checked (for example battery life), all emergency equipment should be accounted for and emergency arrangement logistics should be checked (for example, will all equipment fit in / on the conveyance).
- 6.45 Where a scenario is constructed, it should ideally contain the unexpected, making the emergency team think rather than just running through a standard set of responses (ie consideration should be given to both predicted incident scenarios and further scenario development). The test should be varied on each occasion, to ensure that those involved are not simply following an anticipated progress of events.
- 6.46 Schedule 2 paragraph 5(3) requires the duty holder to consider lessons learned from not just within its own organisation, but those duty holders that it interfaces with and those lessons reported nationally and internationally. Inspectors should determine whether this has been considered within the review and testing, particularly if there is international learning that the inspector is aware of.
- 6.47 Arrangements should also make provision for the inclusion of any learning from experience as a result of tests undertaken, and resultant training requirements.
- 6.48 Paragraph 6 sets out the duties of key personnel ie drivers, escort commanders, masters, carriers and consignors in the event of a radiation emergency. Not all roles may be relevant to all duty holders. Where they are, the emergency plan should be clear as to what the duties are.
- 6.49 Inspectors should confirm that duty holders have consulted with its DGSA and where necessary its RPA to inform its testing of its emergency plan.

Observation of a test

- 6.50 Observation of tests other than partial or full simulations by ONR is unlikely but not impossible. In these cases, it is for the inspector to determine which elements of this section apply to the test being observed.

- 6.51 A full or partial simulation is a single snapshot of the performance of the emergency response teams that could be involved in a radiation emergency. The simulation will deal with a single scenario on one particular day. It is important to form a view in the context of continued readiness and the ability of the duty holder to respond to a real event at any time.
- 6.52 **Important note for inspectors:** An intense training period and/or rehearsal prior to a simulation are not the preferred approach as they can give a false indication of a duty holder's ability to adequately deal with a radiation emergency.
- 6.53 The observation may involve one inspector or a team of inspectors depending upon the complexity and/or size of the scenario. A team approach enables ONR to subject the simulation to an in-depth inspection; this team can, simultaneously, cover a wide variety of facets of the response and the interactions between them. However, the size of the team does need to be proportionate in respect of the priority attached to the intervention, ie informed based upon a prioritised programme.
- 6.54 A team approach also enables ONR to evaluate the management and integration of the response by being in more than one place at the same time. Thus, for any particular simulation an in-depth review of some key areas, together with an overview of others, enables the exercise evaluation team to make a judgement on the ability of the duty holders' staff to cope with a real emergency.
- 6.55 Safety should always take precedence over any form of exercise play. Individuals believed to be suffering from the symptoms of fatigue, distress, and/or heat exhaustion should be pulled out of the simulation before an accident happens. Simulations should be stopped if unsafe acts happen (or are about to happen) or if a real incident / injury occurs.
- 6.56 Exercises should normally be run until the duty holder's simulation objectives (usually stated in the scenario) have been met, and the ONR team is satisfied they have seen enough to allow a judgement on the adequacy of the arrangements to be made.
- 6.57 If an exercise has gone awry eg the casualties have not been rescued after several hours, the exercise should be terminated after a given period of time. Bearing in mind the fatigue load on those taking part (and the fact that if a real event occurs as the exercise is finishing and they may have to respond), four hours is about the maximum that they should be asked to perform.
- 6.58 The ONR team should agree beforehand who will decide / tell the duty holder that the exercise is considered finished; this is usually the ONR inspection team lead. If a consensus is required, inspectors should be contacted by appropriate means (eg mobile phone) to give their view on whether it should finish or not.

Notifications and submissions to the GB Competent Authority required

- 6.59 CDG requires duty holders to make certain notifications and submit certain documents to the GB Competent Authority where transport related emergency arrangements are concerned. For the purposes of the civil carriage of class 7 goods the "GB Competent Authority" shall mean the Office for Nuclear Regulation. These are collated here for ease of reference.

- 6.60 **Notification of a radiation emergency:** As soon as reasonably practicable, the carrier must notify ONR of the event. If once the consignor is made aware of the event, the carrier has not done so, the consignor must notify ONR. Only one notification is required, but the duty is on both the carrier and the consignor in Schedule 2 paragraph 6(2)(a)(i) and 6(3)(a)(iii).
- 6.61 Inspectors should note that in some cases, ONR may receive more than one notification of an event from different duty holders.
- 6.62 **Submission of full assessment report following a radiation emergency:** Paragraph 6(6) identifies the requirement for carriers and consignors, should an event occur, which could give rise to a radiation emergency, to undertake an assessment of the event, consequences and effectiveness of the emergency plan in stages, ie:
- a provisional assessment;
 - a full assessment; and
 - produce a report of the assessment and retain it
- 6.63 The full assessment must be completed within 12 months of the radiation emergency. Once the full assessment report has been completed, the carrier and consignor must provide a copy of the report to the GB Competent Authority within 28 days ^{paragraph 6(7)}.
- 6.64 **Submission of report on testing of an emergency plan:** Schedule 2 paragraphs 5(5) and 5(6) require the report on the outcome of the test (whether successful or not) to firstly be completed within 28 days of the test and subsequently sent to the GB Competent Authority within a further 28 days ie within 56 days of the test concluding. A record of the test should be made. It is ONR's expectation that the report is kept for at least five years.
- 6.65 Guidance exists within both documents identified in paragraph 2.7 of this Guide on the contents of the report.
- 6.66 **Notification of loss or attempted theft of a source:** CDG 2009 Schedule 2 paragraphs 6(2), (3) and (4) require that the GB Competent Authority be notified, as soon as reasonably practicable, of the occurrence of a notifiable event.
- 6.67 Where notifications are made to ONR, the relevant process eg INF1 should be followed to review and/or investigate the event.

ONR response to a notification

- 6.68 Where a radiation emergency occurs, the ONR response should be proportionate to the event itself. For example:
- For low dose / consequence events, the TCA inspector for non-nuclear or the site inspector / transport inspector for the nuclear site licensee may simply keep in regular contact with the duty holder or site to ensure that appropriate arrangements are being followed.
 - For higher dose or consequence events, the ONR RCIS may be stood up to engage with all duty holders and stakeholders during the event.

Determination of adequacy and making a judgement

- 6.69 It is for inspectors to apply their knowledge, experience and discretion to determine the extent and depth of a particular inspection, taking due account of a number of factors such as safety significance, complexity and technical specialism.
- 6.70 In determining adequacy, the ONR Inspection Rating Guide should be used by inspectors. This can be found on [HOW2](#).
- 6.71 Where inspection indicates that a duty holder's arrangements fall significantly short of CDG 2009 requirements, and especially where enforcement action may be warranted under the ONR Enforcement Management Model (EMM), and more specifically ONR-ENF-GD-006 Enforcement, the inspector should seek advice from the relevant Delivery Lead.

7 GUIDANCE ON NOTIFIABLE EVENTS

- 7.1 Within Schedule 2 of CDG, Part 2 Notifiable Events outlines the duties of drivers, carriers and consignors in the event of an occurrence.
- 7.2 A 'notifiable event' is defined as:
- "...the theft or loss of the class 7 goods being carried."*
- 7.3 Notification is required whenever a driver, carrier or consignor becomes aware of or has reason to believe that the loss or theft of class 7 goods being carried has occurred. The driver must notify the police and the consignor.
- 7.4 The carrier, if they become aware of a notifiable event, must notify the police, if not already done so, and the GB Competent Authority.
- 7.5 The consignor must notify the police and the GB Competent Authority, unless this has already been done.
- 7.6 All of the above notifications must be made as soon as reasonably practicable.
- 7.7 If a notifiable event has occurred, then the carrier must make a report to the GB Competent Authority as soon as reasonably practicable.
- 7.8 For ONR, this report should be in the form of an INF1 and be in accordance with its guidance ONR-OPEX-GD-001 Notifying and Reporting Incidents and Events to ONR (see www.onr.org.uk/notify-onr.htm). *Note that within the guidance there are time limits for the notification of Transport events to ONR which the consignor or carrier must be aware of.*
- 7.9 The inspector should confirm that the duty holder's arrangements clearly identify the above requirements, together with the necessary information that the driver, carrier or consignor would need in order to do this ie contact names and numbers at relevant times of the day.
- 7.10 Before an inspection, the inspector should review the INF1 database to identify any recent, relevant notifications (INF1s) and their follow-up reports (FURs) to judge whether it is necessary to provide additional advice and/or guidance to the duty holder during the inspection. This advice or guidance should be recorded.

8 FURTHER READING

- 8.1 IAEA Safety Guide No TS-G-1.2 (ST-3) Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material
www.iaea.org/publications/6348/planning-and-preparing-for-emergency-response-to-transport-accidents-involving-radioactive-material
- 8.2 ONR's transport of radioactive materials web page
www.onr.org.uk/transport/index.htm
- 8.3 ONR Guidance for transport duty holders:
- IRR 2017 Regulation 8 – Radiation Risk Assessment
www.onr.org.uk/transport/irr17-reg-8-transport-guidance.pdf
 - CDG 2009 Emergency Planning and Notification
www.onr.org.uk/transport/emergency-planning-notification-class-7.pdf
 - Five Steps to Transport Emergency Planning
insert hyperlink when available
- 8.4 The Ionising Radiations Regulations 2017
www.legislation.gov.uk/uksi/2017/1075/contents/made
- 8.5 The Health and Social Care Act 2012
www.legislation.gov.uk/ukpga/2012/7/pdfs/ukpga_20120007_en.pdf
- 8.6 The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009
www.legislation.gov.uk/uksi/2009/1348/contents/made
- 8.7 The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) Regulations 2011
www.legislation.gov.uk/uksi/2011/1885/contents/made
- 8.8 The Carriage of Dangerous Goods (Amendment) Regulations 2019
www.legislation.gov.uk/uksi/2019/598/contents/made
- 8.9 Office for Nuclear Regulation, ONR Guide, Notifying and Reporting Incidents and Events to ONR, ONR-OPEX-GD-001 Revision 6
www.onr.org.uk/operational/inspection/onr-opex-gd-001.pdf

For an up-to-date consolidated version of the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009, which includes all amendments made to date, ONR inspectors should use Westlaw UK (see [link](#)).

9 ABBREVIATIONS AND TERMINOLOGY

Abbreviations

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway**
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road**
CDG 2009	The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009
DGSA	Dangerous goods safety adviser
HCDG	High consequence dangerous goods
HCRM	High consequence radioactive material
IIS	ONR's Integrated Intervention Strategy
IIW	Instructions in writing
INF1	ONR Incident Notification Form (obtained from www.onr.org.uk)
IRR 2017	The Ionising Radiations Regulations 2017
ONR	Office for Nuclear Regulation
FUR	Follow-up Report
PPE	Personal protective equipment
RID	Regulations Concerning the International Carriage of Dangerous Goods by Rail**
RPA	Radiation protection adviser
RPE	Respiratory protective equipment

** The latest edition of these references should always be used

Terminology

Radiation Emergency: For the purposes of CDG 2009, means a non-routine situation or event arising during the carriage of class 7 goods 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 one or more of the following:
 - (i) human life;
 - (ii) health and safety;
 - (iii) quality of life;
 - (iv) property;
 - (v) the environment;

Notifiable Event: For the purposes of CDG 2009 Schedule 2, Part 2 paragraph 13, means the theft or loss of the class 7 goods being carried. For the purposes of ADR / RID means an occurrence subject to report as construed in accordance with ADR / RID 1.8.5. Notifications of occurrences involving dangerous goods.

APPENDIX A: CDG AMENDMENT REGULATION 2019 SCHEDULE 2, PARTS 1 AND 2

PART 1

Radiation Emergencies

Interpretation of Part 1

1.—(1) In this Part of this Schedule—

“the 2017 Regulations” means the Ionising Radiations Regulations 2017;

“Category 1 responder” has the meaning given in Part 1, 2 or 2A of Schedule 1 to the Civil Contingencies Act 2004;

“Category 2 responder” has the meaning given in Parts 3, 4 and 5 of Schedule 1 to the Civil Contingencies Act 2004;

“dose consequences” means the consequences to an individual of being exposed to a specific quantity of ionising radiation as the result of a radiation emergency;

“duty holder” means—

- (a) a consignor; or
- (b) a carrier;

“emergency exposure” means an exposure to ionising radiation of an employee engaged in any activity of, or associated with, the response to a radiation emergency or potential radiation emergency in order—

- (a) to bring help to endangered persons;
- (b) to prevent exposure of a large number of persons; or
- (c) to save a valuable installation or goods;

whereby one of the individual dose limits referred to in regulation 12 of the 2017 Regulations could be exceeded;

“emergency services” means those police, fire and ambulance services that are likely to be required to respond to a radiation emergency;

“emergency worker” means—

- (a) a Category 1 responder who has a defined role in an emergency plan;
- (b) a person employed, whether or not by a duty holder, to assist in the transition from emergency state; or
- (c) any other person or organisation that is identified in an emergency plan as having a role in providing assistance in the handling of a radiation emergency;

“escort commander” means a person who is responsible for the escort of a package;

“health authority” means—

- (a) in relation to England, a clinical commissioning group established under section 14D of the National Health Service Act 2006;
- (b) in relation to Wales, a local health board established under section 11 of the National Health Service (Wales) Act 2006; and
- (c) in relation to Scotland, a health board established under section 2 of the National Health Service (Scotland) Act 1978;

“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 3×10^{15} hertz or more, capable of producing ions directly or indirectly;

“radiation emergency” means a non-routine situation or event arising during the carriage of class 7 goods 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 one or more of the following—
 - (i) human life;
 - (ii) health and safety;
 - (iii) quality of life;
 - (iv) property;
 - (v) the environment;

“relevant local authority”—

- (a) in relation to an occurrence in London, means the London Fire Commissioner;
- (b) in relation to an occurrence in an area where there is a metropolitan county fire and rescue authority, means that authority;
- (c) in relation to an occurrence in the Isles of Scilly, means the Council of the Isles of Scilly;
- (d) in relation to an occurrence in any other area in England, means the county council for that area or, where there is no county council for that area, the district council for that area;
- (e) in relation to an occurrence in Scotland, means the council for the local government area; and
- (f) in relation to an occurrence in Wales, means the county council or county borough council for that area.

(2) In this Part of this Schedule any reference to an effective dose means the sum of the effective dose to the whole body from external radiation and the committed effective dose from internal radiation.

(3) For the purposes of this Part of this Schedule, a person assists in the handling of a radiation emergency if the person takes any steps that it is reasonable to take in the prevailing circumstances to reduce or prevent exposure.

(4) For the purposes of sub-paragraph (3), “prevailing circumstances” include—

- (a) the weather;
- (b) the time at which the emergency occurred;
- (c) the distribution of the local population;
- (d) the nature and contents of the package involved in the emergency;
- (e) the stability of the contents of that package;
- (f) the local geography and ecology;
- (g) any other hazards;
- (h) the relative importance of the emergency in relation to other calls that are being made upon the emergency services.

Evaluation and risk assessment

2. Where a duty holder carries out work involving the carriage of any package containing ionising radiation for the first time, that duty holder must comply with the provisions of regulation 8 of the 2017 Regulations as if that duty holder were an employer.

Emergency plans

3. —(1) Before the carriage of a package begins, the duty holder 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 a radiation emergency identified by the duty holder’s assessment under regulation 8(1) of the 2017 Regulations.

(2) But sub-paragraph (1) does not apply if the duty holder’s assessment reveals no radiation emergency may arise during the carriage of a package.

(3) When preparing an emergency plan, the duty holder must take into account—

- (a) the steps the duty holder has taken in accordance with regulation 8(3) of the 2017 Regulations; and
- (b) any variable factors which might affect the severity of the emergency.

(4) The emergency plan must—

- (a) contain the information specified in sub-paragraph (5); and

(b) be drawn up having regard to the principles and purposes set out in paragraph 4.

(5) The information is—

- (a) the name or position of the person authorised to set emergency procedures in motion;
- (b) the name or position of the person in charge of and coordinating the mitigatory action;
- (c) 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;
- (d) the arrangements for limiting the risks to persons likely to be affected by a radiation emergency including how warnings are to be given and the actions persons are expected to take on receipt of a warning;
- (e) the arrangements for providing early warning of the incident to the relevant local authority in which the radiation emergency has occurred, the type of information which should be contained in an initial warning and the arrangements for the provision of more detailed information as it becomes available;
- (f) the arrangements for providing assistance to the relevant local authority with mitigatory action;
- (g) the arrangements for providing information about the incident to the GB Competent Authority;
- (h) the arrangements for emergency exposures including the dose levels which have been determined as appropriate for the purposes of putting into effect the emergency plan;
- (i) the arrangements in relation to doses or reference levels as required by paragraph 9(1); and
- (j) the arrangements which the duty holder, or their agent, considers may assist in the transition from a radiation emergency to a situation where no further intervention is required.

(6) In a case in which Category 1 or Category 2 responders form part of an emergency plan, each duty holder must give such information to those responders as will enable them to perform the functions which are allocated to them by the plan.

(7) Each duty holder must ensure that any employee who may be involved with or may be affected by the arrangements in the emergency plan is or has been 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 dose meters or other devices.

(8) Each duty holder with an obligation to prepare an emergency plan in accordance with this paragraph in relation to the carriage of a package must cooperate with any other person who

is a dutyholder in respect of that package so as to enable each of those duty holders to fulfil their obligations under these Regulations.

Principles and purposes of emergency plans

4. —(1) The principles of intervention to which each duty holder is to have regard when drawing up an emergency plan are—

- (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;
- (d) the necessity of ensuring that an appropriate balance is struck between the expected harms and benefits of any particular protective measure so as to maximise the benefit of that measure.

(2) The purposes of intervention to which the duty holder is to have regard when drawing up an emergency plan are—

- (a) to reduce or stop the release of radiation;
- (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 release of ionising radiation;
- (d) to prioritise the implementation of the plan in relation to a person exposed to dose consequences in excess of the reference level set out in paragraph 9(1).

Review and testing of emergency plan

5. —(1) If an emergency plan is to be used in relation to carriage on more than one occasion, each duty holder must, at suitable intervals not exceeding three years—

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

- (b) test the plan, taking reasonable steps to arrange for all those with a role in the emergency plan to participate in the test to such extent necessary to ensure that the test is effective.
- (2) A review required under sub-paragraph (1)(a) must take into account—
- (a) changes occurring in the carriage of packages 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; and
 - (e) any relevant information derived from a report or review of the consequences of any radiation emergency.
- (3) The test of a plan must take into account any lessons learned from—
- (a) past emergency exposure situations, whether arising during the carriage of packages on behalf of the consignor or by the carrier; and
 - (b) the United Kingdom's participating in emergency exercises at national and international level.
- (4) The test of the plan must be sufficient to test the ability to implement the plan in question but the duty holder must consider the extent of the testing required taking into account—
- (a) the length of time since the last test;
 - (b) the extent of testing undertaken on the last occasion; and
 - (c) any revisions made by the review required under sub-paragraph (1)(a).
- (5) After completion of the test required by sub-paragraph (1)(b), the duty holder must prepare a report on the outcome of the test within 28 days of the conclusion of the test.
- (6) A report made under sub-paragraph (5) must be sent to the GB Competent Authority within 28 days of its preparation.

Duties of drivers, escort commanders, masters, carriers and consignors in the event of a radiation emergency

6. —(1) The driver or escort commander of a vehicle or train, or the master of a vessel, carrying class 7 goods, in the event of a radiation emergency, or the occurrence of an event which could lead to such an emergency, involving those goods—
- (a) must, as soon as reasonably practicable, notify the following—
 - (i) the emergency services;
 - (ii) the relevant local authority;

- (iii) the consignor; and
 - (iv) the carrier;
 - (b) must initiate the emergency plan; and
 - (c) if a radiation emergency occurs, must assist in the handling of that radiation emergency.
- (2) If the carrier of any class 7 goods becomes aware of the occurrence of a radiation emergency, or the occurrence of an event which could lead to a radiation emergency, involving those goods, the carrier—
 - (a) must, as soon as reasonably practicable, immediately notify the following of the event—
 - (i) the emergency services and the relevant local authority, unless the driver, escort commander or master has already done so; and
 - (ii) the GB Competent Authority; and
 - (b) if a radiation emergency occurs, must assist in the handling of that radiation emergency.
- (3) If the consignor of any class 7 goods becomes aware of the occurrence of a radiation emergency, or the occurrence of an event which could lead to a radiation emergency, involving those goods, the consignor—
 - (a) must, as soon as reasonably practicable, notify the following of the event—
 - (i) the emergency services, unless the driver, escort commander, master or carrier has already done so;
 - (ii) the relevant local authority, unless the driver, escort commander, master or carrier has already done so;
 - (iii) the GB Competent Authority, unless the carrier has already done so;
 - (b) must give the GB Competent Authority details of the relevant event; and
 - (c) if a radiation emergency occurs, must assist in the handling of that radiation emergency.
- (4) The consignor must also notify the GB Competent Authority that the emergency plan is initiated, even if no action is taken pursuant to that plan.
- (5) The carrier of any class 7 goods which are involved in a radiation emergency must, as soon as reasonably practicable—
 - (a) arrange for the examination of the load to determine whether any contamination has occurred; and
 - (b) if contamination has occurred—

- (i) arrange for the safe disposal of any part of the load which has been contaminated; and
- (ii) arrange for the decontamination of the vehicle, train or vessel.

(6) In addition, in the event of a radiation emergency occurring, or on the occurrence of an event which could give rise to a radiation emergency, the carrier and the consignor—

- (a) as soon as reasonably practicable, must make a provisional assessment of the circumstances and consequences of such an emergency, and for this purpose must consult—
 - (i) the emergency services;
 - (ii) the health authority in the area within which the radiation emergency or event took place;
 - (iii) the relevant local authority in the area within which the radiation emergency or event took place;
 - (iv) the National Health Commissioning Board and Public Health England, Public Health Wales or Health Protection Scotland (depending where the radiation emergency or event took place); and
 - (v) any other person, body or authority which has functions under the carrier or the consignor's emergency plan;
- (b) as soon as reasonably practicable and in any event within 12 months beginning with the date on which the plan was initiated, or such longer period as the GB Competent Authority may agree, must make a full assessment of the consequences of the emergency and the effectiveness of the emergency plan put into effect as a result of the emergency; and
- (c) within 28 days of the completion of the assessment made under paragraph (b), must make a report of the findings of the assessment and retain a copy of that report for at least 50 years from the date on which it is completed.

(7) The carrier and the consignor must provide the GB Competent Authority with a copy of the report made under sub-paragraph (6)(c) within the period of 28 days beginning with the date on which it was completed.

(8) For the purposes of this paragraph “initiate the emergency plan” means take such steps as it is reasonable and practicable to take in order to put into effect the actions that have been planned for in the emergency plan.

Emergency exposures: employees

7. —(1) Where an emergency plan provides for the possibility of any employee receiving an emergency exposure, each employer must, in relation to the employer's employees—

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

- (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;
 - (c) provide such equipment as is necessary to restrict the exposure of such employees to ionising radiation;
 - (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;
 - (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 purposes of this paragraph must, 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 the GB Competent Authority;
 - (f) make arrangements, in respect of dose assessments to be carried out and notified pursuant to paragraph (e), to notify the results of such assessments without delay to the appointed doctor or employment medical adviser who is carrying out medical surveillance on the employee to whom the assessment relates; and
 - (g) identify those employees who are authorised, in the event of a radiation emergency, to permit any employee referred to in paragraph (a) to be subject to an emergency exposure and provide employees who are so authorised with appropriate training.
- (2) The duty holder must notify the GB Competent Authority of the dose levels which they have determined are appropriate to be applied in respect of an employee identified for the purposes of sub-paragraph (1)(a) in the event of an emergency.
- (3) A notification under sub-paragraph (2) must be given—
- (a) in relation to transport of class 7 goods by road, rail or inland waterway which is to be carried out once only, at least 28 days before the transport is carried out, or within such shorter time as the GB Competent Authority may agree;
 - (b) in relation to any other transport of class 7 goods by road, rail or inland waterway, at least 28 days before the transport is first carried out, or within such shorter time as the GB Competent Authority may agree.
- (4) Where the carrier and the consignor together determine that a dose level notified under sub-paragraph (2) is no longer appropriate to be applied in respect of an employee for the purposes of sub-paragraph (1)(a) in the event of such an emergency, and that a revised dose level is to be determined, the duty holder must, at least 28 days before formally determining the revised dose level, or within such shorter time as the GB Competent

Authority agrees, notify the GB Competent Authority of the revised dose level which the operator considers is appropriate to be applied.

(5) In any case where, in the opinion of the GB Competent Authority, the dose levels for emergency exposure notified pursuant to sub-paragraph (2) or (4) are too high, the carrier and the consignor must, if directed to do so by the GB Competent Authority, substitute such other dose level or levels as the GB Competent Authority considers appropriate.

(6) Where an emergency plan is initiated, each employer must ensure—

- (a) that no employee of that employer who is under 18 years of age, no trainee or apprentice under 18 years of age, and no female employee who is pregnant or breastfeeding is subject to an emergency exposure;
- (b) that no other employee of that employer is subject to an emergency exposure unless—
 - (i) that employee has agreed to undergo such exposure;
 - (ii) the requirements of sub-paragraph (1)(a) to (f) have been complied with in respect of the employee; and
 - (iii) that employee has been permitted to be so by an employee authorised for that purpose under sub-paragraph (1)(g); and
- (c) that no employee of that employer involved in implementing an emergency plan is exposed to a dose of ionising radiation in excess of the dose level determined in accordance with sub-paragraph (2), (4) and (5).

(7) The requirement imposed on the employer under sub-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 until the date from which the employer ought reasonably to have been aware of that fact.

(8) The requirement imposed by sub-paragraph (6)(c) does not apply in respect of an exposure of any employee who—

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

(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 sub-paragraph complying with the requirements to which it would be subject if it were a dose record.

(10) An employer must, at the request of that employer's employee in circumstances where a dose record has been created for the purposes of sub-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 the dose relating to that employee.

(11) In the event of a report being made under paragraph 6(6)(c) relating to the circumstances of an emergency exposure and the action taken as a result of that exposure, an employer must keep such a report (or copy of that report) until the person to whom the report relates has or would have attained the age of 75 years but in any event for at least 30 years from the termination of the work which involved the emergency exposure.

(12) In this paragraph—

- (a) “appointed doctor”, “approved dosimetry service”, “dose assessment”, “dose record” have the meanings given by the 2017 Regulations;
- (b) “medical surveillance” means medical surveillance carried out in accordance with the 2017 Regulations.

Disapplication of dose limits

8. —(1) Regulation 12 of the 2017 Regulations does not apply to an emergency worker, where that emergency worker—

- (a) is engaged in preventing the occurrence of a radiation emergency; or
- (b) is acting to mitigate the consequences of a radiation emergency.

(2) An emergency worker may be exposed to an effective dose not exceeding 500 mSv whilst they are undertaking the activities set out in sub-paragraph (1).

Reference levels

9. —(1) The carrier and consignor must ensure the emergency plan prioritises keeping doses below a 100 mSv reference level or the emergency specific reference level if applicable.

(2) Where the response to a radiation emergency is underway, specific reference levels, to optimise the response, may be determined by the relevant local authority in whose area the radiation emergency has taken place and in whose area the response is taking place.

(3) In determining a specific reference level under sub-paragraph (2), the relevant local authority must take advice from the person coordinating the response to the radiation emergency.

Packages involved in a radiation emergency

10. A package which has been involved in a radiation emergency must not be carried or caused to be carried, unless—

- (a) the consignor or the consignor’s agent has examined the package; and
- (b) the consignor has issued a certificate indicating that the consignor is satisfied the package complies with the requirements of these Regulations.

Prior information to the public

11. —(1) The GB Competent Authority must make available to the public information about the nature and effect of a radiation emergency.

(2) The information to be provided under sub-paragraph (1) must include—

- (a) basic facts about radioactivity and its effects on persons and on the environment;
- (b) the consequences of a radiation emergency;
- (c) emergency measures envisaged to alert, protect and assist the general public in the event of an emergency;
- (d) appropriate information on action to be taken by the general public in the event of a radiation emergency; and
- (e) the authority or authorities responsible for implementing the emergency measures and actions referred to in paragraphs (c) and (d).

Duty to provide handover report to the authority responsible for recovery following a radiation emergency

12. —(1) The consignor of class 7 goods involved in a radiation emergency must—

- (a) prepare a handover report; and
- (b) provide a copy of the handover report to the recovery authority.

(2) For the purposes of this paragraph “handover report” means a report about a radiation emergency which—

- (a) includes the details of the incident giving rise to the emergency;
- (b) states whether the emergency plan was initiated and if so, state the actions (if any) taken by the driver, the escort commander, the carrier, the master and the consignor to assist in the handling of the radiation emergency;
- (c) states whether any part of the load involved in the emergency was contaminated and if so, state the steps taken by the consignor to arrange for—
 - (i) the safe disposal of the relevant part of the load; and
 - (ii) the decontamination of the relevant vehicle, train or vessel;
- (d) states any anticipated effects of the radiation emergency on the environment;
- (e) includes any other information which the consignor considers may assist in the transition from an emergency state.

(3) The consignor must consult the carrier of the relevant class 7 goods when preparing the handover report.

(4) The consignor must prepare the handover report and deliver it to the recovery authority as soon as reasonably practicable after the completion of the examination required by paragraph 6(5).

(5) In this regulation, “recovery authority”—

- (a) in relation to a radiation emergency occurring in England, means the Secretary of State;
- (b) in relation to a radiation emergency occurring in Wales, means the Welsh Ministers;
- (c) in relation to a radiation emergency occurring in Scotland, means the Scottish Ministers.

PART 2

Notifiable Events

Duties of drivers, carriers and consignors in the event of a notifiable event

13. —(1) The driver of a vehicle or train, or the master of a vessel, carrying class 7 goods who discovers, or has reason to believe, that a notifiable event has occurred in relation to the vehicle, train or vessel must, as soon as reasonably practicable, notify—

- (a) the police; and
- (b) the consignor.

(2) If the carrier of any class 7 goods becomes aware of the occurrence of a notifiable event in relation to those goods the carrier must, as soon as reasonably practicable, notify—

- (a) the police, if the driver, escort commander or master has not already done so; and
- (b) the GB Competent Authority.

(3) If the consignor of any class 7 goods becomes aware of the occurrence of a notifiable event in relation to those goods the consignor must, as soon as reasonably practicable, notify—

- (a) the police, unless the driver, the escort commander, the carrier or the master has already done so; and
- (b) the GB Competent Authority, unless the carrier has already done so.

(4) If a notifiable event occurs the carrier must ensure that, as soon as reasonably practicable, a report is made to the GB Competent Authority.

(5) The report required under sub-paragraph (4)—

- (a) must be in a form approved by the GB Competent Authority; and
- (b) must contain all relevant information which the GB Competent Authority has communicated to the carrier that it considers necessary.

(6) In this paragraph, “notifiable event” means the theft or loss of the class 7 goods being carried.”