

Draft Guidance on Exemptions Framework under the Radioactive Substances Act 1993 (Schedule 23 to the Environmental Permitting (England and Wales) Regulations 2011)

Guidance Document

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¹ In this guidance, this legislation is referred to as ‘The legislation’, meaning it applies to both RSA93 and EPR10. In those circumstances where the guidance relates only to one of the pieces of legislation, the specific legislation is referenced. In RSA93, the terms ‘authorisation’ (for the accumulation and disposal of radioactive waste) and ‘Registration’ (for the keeping and use of radioactive substances), are used. In EPR10, these have been replaced, in England and Wales, by the term ‘Permitting’. In this guidance, the term ‘Permitting has been used throughout to apply to both regimes, and both types of permit under RSA93.

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1. Introduction and background

General

- 1.1 This guidance sets out Government's expectations of the exemptions regime. It provides information to the environmental regulators and users on the means by which the objectives of the exemptions regime should be delivered.
- 1.2 Two concepts are used in this document (see Annex 1 for a fuller explanation of these concepts as applied in UK legislation):
 - 'Out of scope' of regulation. Effectively, 'out of scope' equates to 'not radioactive' for the purposes of the legislation. Matters which are 'out of scope' are not subject to any regulatory requirement under this legislation.
 - 'Exempt'. Although by definition matters which are exempt are exempted from the need for prior reporting, they are defined as radioactive under the legislation. The exempt matters are subject to conditions; that is, matters are only exempt if the conditions are complied with.

Hierarchy of Legislation and Guidance

- 1.3 This guidance represents an aid to interpretation of the legislation. It sets out how the various provisions in the legislation have been determined, and how each provision in some way supports the application of 'risk-informed regulation'.
- 1.4 This guidance should be read in conjunction with the legislation; not all of the details and numerical levels are repeated in this guidance.
- 1.5 The hierarchy can be set out in three levels:
 - **The legislation** sets out the legal provisions dealing with the scope and the exemptions from the requirements for a permit.
 - **Government guidance** (this document) sets out the expectations of the UK Government and Devolved Administration (referred to as the "Government" throughout the rest of this document) with regard to this legislation. It is primarily intended for use by the environmental regulators but will also assist those subject to the legislation. It is intended to be read alongside the legislation.
 - **Regulators' guidance** (procedural guidance) sets out procedural matters in detail. It describes, where appropriate, examples of Best Practice.
- 1.6 To illustrate the relationships between the three levels of the hierarchy, we can take the example of a condition in the Exemption Order relating to record keeping.
 - **The Legislation** states that adequate records of waste disposals must be kept.

- **Government guidance** (this document) sets out the purpose of record keeping, and explains why different types of record may be required for different circumstances.
- **Regulators' guidance** sets out the procedural issues related to record keeping. Depending on need, it could set out the appropriate format, retention periods and recording medium etc) appropriate to certain specific circumstances.

Underpinning of the 'exemptions' and 'out of scope' numerical levels.

- 1.7 The basis on which the various levels and waste disposal criteria have been developed are mainly related to the radiation dose which may be received by a member of the public.
- 1.8 For the 'out of scope' levels, there are two radiation dose constraints:
 - For naturally occurring radioactive substances or articles used in 'industrial activities', the level is based on a maximum radiation dose of 300 $\mu\text{Sv}/\text{year}$ to a member of the public.
 - For anthropogenic radionuclides, and for naturally occurring radioactive substances or articles used in practices, the levels are based on a maximum radiation dose of 10 $\mu\text{Sv}/\text{year}$ to a member of the public.
- 1.9 Note that the legislation may apply if a human activity constitutes a 'practice' or is listed as a 'NORM industrial activity'. Any human activity which is not a 'practice' or a 'NORM industrial activity' is outside the scope of regulation (e.g. the distribution and use of natural gas for domestic or industrial use).
- 1.10 The radiological impact assessments which have been carried out to support these levels take into account a wide variety of possible pathways, and assume no controls are placed on, say, the disposal of radioactive waste.
- 1.11 The principal difference between the constraint applied to NORM industrial activities (300 $\mu\text{Sv}/\text{year}$) and for practices (10 $\mu\text{Sv}/\text{year}$) is that in the former case it is not practicable to regulate NORM such that the lower limit is met. A different value has been selected based on the natural variability of radiation exposures. The exception to this general principle, where the lower limit can be applied, is when NORM radionuclides are being used specifically for their radioactive, fertile or fissile properties.
- 1.12 For the exemption levels and waste disposal criteria, the dose constraint is, again 10 $\mu\text{Sv}/\text{year}$ to a member of the public for most situations. The exemption is that the exemption criterion of 300 $\mu\text{Sv}/\text{year}$ applies to disposals of NORM wastes from industrial activities, with an additional constraint of 1 mSv/year to a worker such as a landfill operative.
- 1.13 However, in the case of exemption for disposal, the radiological impact assessments do not assume uncontrolled disposal of waste to the environment. Restrictions are placed on the type of substance or article (e.g. a waste sealed source), on the disposal route (e.g. to a sewer, or to a landfill), or on the management of waste (e.g.

disposed of in considerable quantities of non-radioactive waste) etc. These restrictions are imposed by way of conditions in a conditional Exemption Order.

- 1.14 Some conditions in the Exemption Order are in place to help ensure that the 10 $\mu\text{Sv}/\text{year}$ to a member of the public dose constraint will be met; other conditions are in place so that a user can demonstrate that they are in control of radioactive substances and articles. An example is the need to keep records of holdings and disposals.

2. Guidance on the definition of radioactive material and radioactive waste

Meaning of radioactive material and radioactive waste

Radioactive material

2.1 The approach that has been adopted in the legislation is that a substance or article is only radioactive material if it falls within one or more of the following three 'inclusion' categories:

- It contains naturally occurring radionuclides **and** is used in or arises from a listed industrial activity.
- It contains naturally occurring radionuclides that are used for their radioactive fertile or fissile properties.
- It contains artificial radionuclides.

2.2 If a material falls within one or more of these categories it is still possible for it not to be classed as radioactive material, and be removed from the scope of regulation, if it meets one of four 'exclusions'; these exclusions are:

- All radionuclides contained in the material are of short half life (<100 seconds).
- Its radioactivity is solely attributable to artificial background.
- It has been lawfully disposed of or is contaminated as a result of such a disposal.
- It is a contaminated material which remains on the premises where it was contaminated.

Radioactive waste

2.3 A waste is radioactive waste if it meets the three criteria outlined above for radioactive material, when it becomes a waste. The only difference between materials and wastes is that the exclusion relating to contaminated material remaining on the premises where they were contaminated does not apply to wastes.

2.4 Guidance on the intention of each of the three inclusion categories and the four exclusion categories is presented below. The definition of radioactive material and radioactive waste and the associated decision making process is shown diagrammatically in Figure 1. (The text in Figure 1 is necessarily abbreviated and should be read in conjunction with the legislation and this guidance. The references 1A – 1F are to the relevant articles of the legislation).

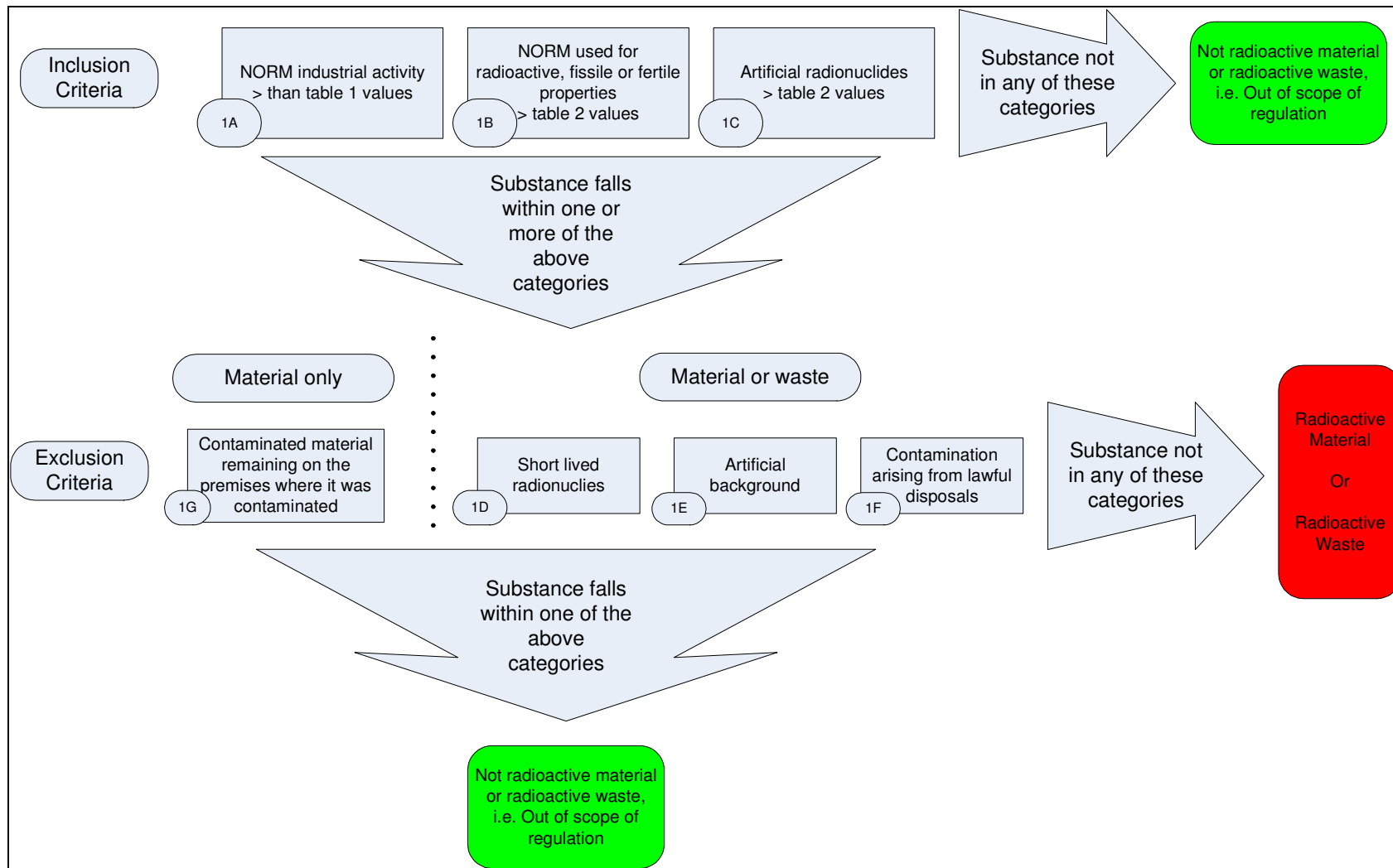


Figure 1 – Representation of definition of radioactive material and radioactive waste

Inclusions

2.5 For a substance to be classed as radioactive material or radioactive waste it must fall within one of the three 'inclusions' set out in paragraph 2.1. If the substance does not fall within any of these three descriptions it is out of scope of regulation and is not to be regarded as being radioactive material or radioactive waste.

NORM industrial activities

2.6 To be radioactive material or radioactive waste under this provision a substance or article must satisfy three requirements:

- It must be used in or arise from a NORM industrial activity listed in Table 3 of the legislation, or it must be contaminated by radionuclides which originate from a NORM industrial activity.
- It must contain radionuclides listed in Table 1 of the legislation.
- Those radionuclides must be present at concentrations greater than the relevant concentrations in Table 1 of the legislation.

2.7 The phrase 'used in or arises from a NORM industrial activity' is intended to capture raw materials, products and by-products of the named industrial activity. The fabric of buildings and equipment used in the specified industrial activities should not be considered to be captured by this clause². Where the fabric of buildings or equipment are contaminated by radionuclides that originate from a NORM industrial activity these are captured by this definition.

2.8 Any substance captured by the first requirement must also contain radionuclides listed in the first column of Table 1. The radionuclides listed in Table 1 are the only ones that are subject to regulatory consideration. Other radionuclides of natural terrestrial or cosmic origin such as potassium-40 and samarium-147 have been deliberately omitted from Table 1 and are out of scope of regulation.

2.9 Once a substance has been identified as falling within this clause and containing radionuclides listed in Table 1 it shall be considered to be radioactive material or radioactive waste unless the concentrations of the radionuclides listed in table 1 are less than the specified values. All radionuclides specified in Table 1 that are present in the substance should be considered when deciding if the values are exceeded, using the summation rule where applicable. For example, if the industrial activity being considered is production and use of uranium not for its radioactive, fissile or fertile properties, any thorium (and its daughter nuclides) in the material should be considered along with the uranium content.

2.10 When considering contaminated materials, it is only the radionuclides that are attributable to that contamination that should be compared against the Table 1 values. Background radioactivity can be disregarded.

² The exception to this is where the equipment is explicitly captured by the listed industrial activity, e.g. use of depleted uranium source shielding containers would be captured under 'production and use of uranium not for its radioactive, fertile or fissile properties'.

Processed radionuclides of natural terrestrial or cosmic origin

2.11 To be radioactive material or radioactive waste under this provision a substance or article must satisfy three requirements:

- It must contain a radionuclide of natural terrestrial or cosmic origin which is listed in Table 2 of the legislation.
- It is processed or intended to be processed for the radioactive fertile or fissile properties of those radionuclides, it is contaminated by radionuclides originating from such a process.
- In the case of a solid those radionuclides must be present at concentrations greater than the relevant concentrations in Table 2 of the legislation.

2.12 The clause brings under regulation those substances which contain radionuclides which are being exploited for their radioactive, fertile or fissile properties. If a substance has been identified as being or intended to be processed for its radioactive fertile or fissile properties then all of the radionuclides that are of natural terrestrial or cosmic origin that are listed in Table 1 should be considered when comparing the radionuclide inventory to the Table 1 values. The only natural radionuclides that are listed in Table 2 are those in the uranium-238, uranium-235 and thorium-232 decay chains³. Other radionuclides of natural terrestrial or cosmic origin such as potassium-40 and samarium-147 have been deliberately omitted from Table 2 and are out of scope of the regulations.

2.13 In the case of contaminated substances it is only the radionuclides associated with the contamination that should be considered. Background radioactivity can be disregarded.

2.14 The legislation requires all radionuclides listed in Table 1 that are present in such substances to be taken into account when comparing the radionuclide inventory to the Table 1 values. This means that any artificial radionuclides present in the substance need to be included in the summation calculation.

2.15 Liquids and gases which contain natural radionuclides which are intended to be processed for their radioactive, fertile or fissile properties are considered radioactive material or radioactive waste irrespective of the radionuclide concentrations. Such substances will be subject to regulation unless they are covered by an appropriate exemption.

Radionuclides not of natural terrestrial or cosmic origin

2.16 This clause means that any substance that contains artificial radionuclides should be considered to be radioactive material or radioactive waste unless the artificial radionuclide content is less than the relevant value in Table 2 of the legislation. There

³ Note that the radionuclides H-3 and C-14 can be both 'natural' (cosmogenic) and 'artificial'.

are no values for aqueous liquids or gases in Table 2. This means that any aqueous liquid or gas that contains artificial radionuclides should be considered to be radioactive unless one of the other exclusions set out in the legislation applies.

- 2.17 When determining if a substance containing artificial radionuclides exceeds Table 2 values there is no requirement to take account of any naturally occurring radionuclides present unless they have been processed for their radioactive, fertile or fissile properties.

Other substances containing NORM radionuclides

- 2.18 Substances containing naturally occurring radionuclides that are not used in or arising from a listed work activity and that are not used for their radioactive, fertile, or fissile properties are not captured by any of the above inclusions and are therefore not radioactive material or radioactive waste.
- 2.19 Similarly natural radionuclides that are not listed in Table 1 or Table 2 are out of scope of this regulatory regime. Examples of such radionuclides are potassium-40 and samarium-147.
- 2.20 Radon is not included as a main entry in Table 1 or Table 2; however, it is included as a component of the decay series of some of radionuclides that are listed. This means that unassociated radon is out of scope of regulation. However, where radon is present as a result of the keeping and use of radioactive material that contains radium or the accumulation and disposal of radioactive waste that contains radium, the government expects that the regulators will take account of related radon exposures to the public and the environment when regulating the radium containing material or waste. For example: radon in natural gas is out of scope of regulation, but radon exposures to the public resulting from the disposal of radium containing wastes is a legitimate regulatory consideration when considering such wastes.

Exclusions

- 2.21 If a substance falls within any of the above three definitions it should be regarded as radioactive material unless one of the following 'exclusions' applies.

Radionuclides with a short half life

- 2.22 Any substance or article that contains only radionuclides with a half-life not exceeding 100 seconds is not radioactive material or radioactive waste. This exclusion applies to all normal physical forms, i.e. solids, liquids and gases.
- 2.23 If the substance contains radionuclides with a half-life exceeding 100 seconds then the activity of all relevant radionuclides is taken into account including those with a half life-less than 100 seconds.

Artificial background radioactivity

2.24 Any substance or article that contains only artificial radionuclides as a consequence of background radioactivity are not considered to be radioactive material or radioactive waste. Artificial background means those radionuclides which are ubiquitous in the environment as a result of environmental processes such as the circulation of the oceans and the atmosphere.

2.25 This exclusion is not intended to capture radionuclides which are present in the environment as a result of permitted (or exempted) discharges; localised concentrations of such radionuclides should not be considered normal if they can be attributed to such discharges. Such contamination is explicitly addressed in a separate exclusion (see paragraphs 2.31-2.34 below).

2.26 If a substance contains artificial radionuclides which are 'background' and additional artificial radionuclides, the background component can be disregarded when determining if a substance exceeds the Table 2 concentrations.

Contaminated materials

2.27 Any material that is contaminated is not radioactive material providing that certain conditions are met:

- It was not contaminated with the intention of using the radioactive, fissile or fertile properties of the radionuclides.
- It would not be radioactive material if the contamination was not present
- It remains on the premises⁴ where it was contaminated.

2.28 The first condition is required because contamination has a wide meaning in the legislation and can mean deliberately activating material so that it can be used for its radioactive properties, e.g. production of radionuclides in a cyclotron for use in medical procedures. Such materials are not removed from the scope of regulation by this exclusion. However, the components of a cyclotron would be captured by this exclusion and will not be considered to be radioactive material for the purpose of this legislation.

⁴ 'Premises' in this context means a site or facility which, if it were permitted under the legislation, would be covered by one permit. A group of buildings on one site owned by one legal entity would constitute a 'premises'.

2.29 This exclusion is restricted to materials that remain on the premises where they were contaminated. If materials are moved off the premises they will be radioactive material if they fall within one of the 'inclusion' definitions.

2.30 This exclusion only applies to materials – if the material becomes a waste then it should be treated as a radioactive waste unless it falls within one of the other exclusions. Examples include contaminated plumbing and extraction systems, cyclotron housing, and other contaminated equipment. In the case of these examples, they are not considered to be radioactive unless and until:

- The material in question is removed from the premises for use elsewhere; or
- The material in question becomes waste.

Disposed of and contaminated substances and articles

2.31 Any substance is not radioactive material or radioactive waste where its radionuclide content is attributable to lawful disposal. Disposal is widely defined in this legislation and includes transfer to another person; therefore this exclusion only applies where no further act of disposal is foreseen, e.g. discharge of liquid or gaseous waste to the environment or closure of a solid waste disposal facility where there is no intent to retrieve the waste.

2.32 This exclusion does not apply where, following the disposal, a process occurs which was not taken into account by the disposing authority and which leads to an increase in the radiation exposure to the public or the environment. For example, if radioactive waste was retrieved following disposal to a solid waste disposal facility that waste would be radioactive waste. Similarly, radioactive waste arising from the remediation of contaminated land would also be radioactive waste.

2.33 An example of material that would be captured by this exclusion is Irish Sea sediments which have been contaminated by historical discharges. Such material may be subject to dredging and subsequent disposal further out to sea. In this case the dredgings would not be considered to be radioactive waste providing that they do not result in an increase in radiation exposure to the public. If the dredged material was brought to land for use or disposal it is likely that it should be considered to be radioactive material or radioactive waste due to the creation of exposure pathways which were not taken into account at the time of the original contamination.

2.34 Although radioactive waste which has undergone permanent disposal to, say, a landfill, becomes, by definition, not radioactive waste, this does not negate any monitoring requirements set out in a permit for the post-closure period. For instance, a repository for the permanent disposal of Low Level Radioactive Waste may be closed, but groundwater monitoring for a period into the future may still be required.

Solid and liquids

2.35 Table 1 contains three columns, one for each of 'solids', 'aqueous liquids', and 'gases'. Table 2 has one column – for solids. For the purposes of waste disposal, the radiological impact assessments which support the levels in the tables are based on reasonable assumptions. For instance, the drinking water pathway giving rise to a

human radiation dose is a major feature of the assessment for aqueous liquids, but not for solids. Solids are not disposed of directly to rivers, for example, and other legislation is intended to prevent such an activity.

2.36 There are certain liquids – for instance mercury and oils - for which the drinking water pathway equally can be ruled out, not least because other pollution control legislation does not allow this. The legislation therefore allows such liquids to be treated in the same way as solids (that is, using the levels in the 'solids' column of Table 1 and Table 2) provided that the disposal of such materials is to a conventional 'solid' waste route; that is, not disposed of to drains, sewers, open water or groundwater.

3. Material or waste which is exempted from full regulation

General

- 3.1 The exemptions regime is conditional; that is, if a person does not comply with the conditions, the exemption does not apply. Where a person carries on various activities in relation to radioactive material or waste and does not have a permit to do so and an exemption does not apply, that person may commit a criminal offence for which the penalties are a fine, imprisonment or both.
- 3.2 Exemptions are in place for five regulated activities:
- Keeping and use of radioactive materials.
 - Keeping and use of radioactive materials (mobile apparatus).
 - Disposal of radioactive waste.
 - Accumulation of radioactive waste.
 - Receipt of radioactive waste for the purposes of disposal (EPR11 only).
- 3.3 In each case, a different set of conditions applies (although some conditions are common to two or more situations).

Exemption from permitting for keeping and use

Exemptions

- 3.4 A person is exempt from permitting of the radioactive material described below. The descriptions in this paragraph apply to radioactive material in all its physical forms – solid, liquid or gas:
- For material where the **quantity** of any radionuclide listed in column 1 of Table 1 of the Exemption Order which that material contains does not exceed the adjacent value specified in column 2 of that table. An aggregation rule applies.
 - The material contains any radionuclide listed in column 1 of Table 1 and the **concentration** of any particular radionuclide in that material does not exceed the value specified in column 3 of that table adjacent to that radionuclide. An aggregation rule also applies to this provision.
- 3.5 The two provisions above are based on the general exemption values for 'moderate quantities' from Annex 1 of the Basic safety Standards Directive (BSSD). The values are those used in the Ionising Radiations Regulations 1999 (IRR99) as the levels

below which prior notification to the Health and Safety Executive is not required. This brings the exemption requirement for 'prior notification' into line for both the IRR99 and this legislation.

- 3.6 The Directive also allows Member States to exempt certain practices etc from prior reporting based on a consideration of risk:
- For the radioactive material described in column 1 of Table 2 the quantity of any radionuclide which that material contains does not exceed in respect of any one item of that material, the value specified in column 2 of that table adjacent to that radionuclide; and in respect of the premises where the material is kept or used, the value specified in column 3 of that table adjacent to that radionuclide.
 - For material intended for use for medical or veterinary diagnosis or treatment, or clinical or veterinary trials, the quantity of open source material on any premises of Technetium-99m which that material contains does not exceed 1×10^9 Bq and the quantity of all other radionuclides does not exceed 1×10^8 Bq.
 - The material is stored in the course of transit⁵.

Conditions

- 3.7 In order for radioactive material to be exempt from permitting, all of the following conditions need to be applied:
- **Sealed sources, unsealed sources or packaged radioactive material should not be deliberately modified or mutilated; no action is allowed which would result in the loss of containment, leading to an uncontrolled release of radioactive material outside the sealed object or package.**
- 3.8 This condition does not mean that packaging etc cannot be removed; provided that there is no loss of radioactive material, labelling or outer packaging can be modified. Obviously, the purpose of unsealed radioactive material cannot be fulfilled unless the material is dispensed. This is the reason for the word 'uncontrolled' in the condition.
- **Keep an adequate record, where practicable, of such material which the person keeps or uses.**
- 3.9 The purpose of record keeping is such that the owner of the material can demonstrate that he/she has full control over the material in his/her possession. Records may be subject to inspection by the environmental regulator.
- 3.10 The nature of record keeping is a matter for regulators' guidance, which will set out the record keeping needs in a proportionate manner for a number of specific situations.

⁵ Note that the conditions for storage in transit are not the same as those for general keeping and use.

- **Ensure that where practicable such material is marked or labelled as radioactive material.**

3.11 This measure is intended to ensure that persons (workers) on any premises where radioactive materials are stored are aware of the materials present and can make suitable provision for radiation dose minimisation; that is, by reducing unnecessary handling or spending time in proximity to radioactive sources or source stores.

3.12 The condition recognises ('where practicable') that such marking or labelling is not possible in the case of, say, very small sources. There are cases where the labelling of assemblies or containers of such small sources is more practical.

- **For any loss of containment, or suspected loss of containment, inform the environmental regulator without delay.**

3.13 This condition is intended for non-trivial breaches of containment, which could result in an increase in radiation dose to a member of the public, or a measurable increase in the concentration of radionuclides in the environment.

- **Store safely and securely such material to prevent, so far as possible, accidental removal, loss or theft.**

- **In respect of an incident of loss or theft, or suspected loss or theft, of such material which the person keeps or uses, notify the incident to the environmental regulator as soon as practicable.**

3.14 The environmental regulator will decide on a case-by-case basis whether the loss or theft is a matter for the police. In this case, the regulator will be responsible for notification to the police.

- **Allow the environmental regulator access to such records or such premises as it may request in order to determine that the above conditions are being complied with.**

Exemption from permitting for keeping and use (mobile apparatus)

Exemptions

3.15 For all undertakings to which the article on registration of users of radioactive material – mobile apparatus applies, a person is exempt from permitting under that section in respect of the radioactive material described below:

- For the radioactive material described in column 1 of Table 2 the quantity of any radionuclide which that material contains does not exceed in respect of any one item of that material, the value specified in column 2 of that table adjacent to that radionuclide; and in respect of the person who holds the material, or the premises where the apparatus is stored, the value specified in column 3 of that table adjacent to that radionuclide.

- 3.16 Note that for ‘keeping and use’ there are limits on the total holdings on any particular premises. In the case of mobile apparatus, the same limits also apply to the person who is responsible for the apparatus. That is, because the apparatus may be used, at any one time, on a number of premises, there is an additional limit on how much any single operator may own under the exemption provision.
- 3.17 The legislation covers complex situations where a holder may have both mobile and non-mobile sources, or may hold a permit for some or all sources in either category. However, very complex situations of location, ownership and use of mobile and non-mobile sources may arise. In such circumstances, regulatory advice may be needed by the holder, and the actual situation and need will be determined on a case-by-case basis in line with the above provisions.

Conditions

- 3.18 The conditions for exemption of mobile radioactive apparatus are essentially the same as those in the ‘keeping and use’ section above, with some minor changes to wording to reflect that the radioactive source is mobile, and not necessarily stored on any one particular premises.

Exemption of solid radioactive waste disposal

Exemptions

- 3.19 Solid waste disposal provisions have been derived from the existing practice of ‘dustbin disposal’ and the Government’s Low Level Radioactive Waste Policy of 2007. In short, the definition of Very Low Level Radioactive Waste (VLLW) has been used to derive the exemption values for solid waste. As with ‘dustbin disposal’, a presumption used in the radiological impact assessments is that the waste is disposed with significant quantities of non-radioactive refuse. Because waste management practices change, for instance as more waste is recycled and less disposed to landfill, Government will review and update these assessments from time to time.
- 3.20 A person is exempt from permitting for the disposal of radioactive waste under the legislation in respect of the disposal of **solid** radioactive waste described below. Exempt waste needs to meet **all** of the following descriptions.

- The radioactive waste is described in column 1 of Table 3.

and

- The quantity or concentration level of any radionuclide which that radioactive waste contains does not exceed any value specified in column 2 of that table.

and

- The quantity of the waste or, as applicable, the quantity of any radionuclide which that waste contains, does not exceed any value specified in column 3⁶ of that table during the period specified in that column.

and

- The manner of disposal is as described in column 4 of that table.

and

- The solid waste has not been subject to a process of deliberate dilution in order to reduce the solid concentration to below the values shown in column 3 of that table.

Conditions

3.21 In order for solid radioactive waste to be exempt from permitting, all of the following conditions need to be applied:

- **Keep an adequate record of such waste disposed.**

3.22 When waste has been disposed of or transferred, it is effectively beyond the control of the disposer. This condition is such that the disposer can demonstrate that he/she has exercised control over the waste, and to allow future dose assessments or verification of dose assessment models to be carried out if necessary.

- **Except where such waste is disposed of to a person who holds a permit under the regulations, dispose of such waste by causing it to be transferred to premises used for the management, treatment or disposal of substantial quantities of waste which is not radioactive⁷.**

3.23 Radiological impact assessments for 'dustbin disposal' are based on an assumption that the receiving facility (e.g. a landfill, waste transfer station, recycling plant, or incinerator etc) also manages large quantities of non-radioactive wastes. Receiving facilities (e.g. some incinerators and some landfills or parts of landfills) which have been constructed and are being operated for the management of radioactive wastes will be permitted.

- **Ensure that where practicable any marking or labelling of the waste or its container, denoting the presence of radioactivity, is removed before the person disposes of that waste to premises used for the disposal of substantial quantities of waste which is not radioactive.**

3.24 The discovery of trefoil labelling in a conventional landfill can be wasteful of regulatory (or even police) resources. The intent is therefore that radioactive waste is not labelled when the destination is one where substantial quantities of non-radioactive waste are disposed.

⁶ A number of rows in Table 3 are concerned with the disposal of solid waste and solid sealed sources. For the purposes of this legislation, a liquid which is sealed within a solid container can be treated as if it were a 'solid'.

⁷ Note that Transport Regulations may still apply to such transfers.

- **Where the waste is a disused High Active Sealed Source, notify the environmental regulator of the details of the disposal within 14 days. This does not apply to gaseous tritium lighting devices, for which no notification is required.**
- **Allow the environmental regulator access to such records or such premises as the regulator may require in order to determine that the above conditions are being complied with.**

3.25 There are persons who receive radioactive waste (premises used for management etc. of wastes which are not radioactive) for burial on land or incineration but who may be unaware of the presence of very low concentrations of radioactivity or trivial strength sources in a dustbin. The above conditions **do not apply** to the receiver. The principle here is that, in order to meet the relevant criterion for safety, conditions are applied to the waste producer, and not to the waste receiver. Further controls are not necessary when the waste has left the premises where it arose. However, all other waste legislation continues to apply to such persons, for instance, the IRR99.

Exemption of liquid radioactive waste disposal

Exemptions

3.26 The disposal of **aqueous liquid**⁸ radioactive waste means radioactive waste to which the following description applies:

- The aqueous waste contains any radionuclide listed in column 1 of Table 4 and the **concentration** of any particular radionuclide in that waste does not exceed the value specified in column 2 of that table adjacent to that radionuclide. An aggregation rule applies here.

and

- The aqueous waste has not been subject to a process of deliberate dilution in order to reduce the aqueous liquid concentration to below the values shown in column 2 of table 4⁹.

⁸ Aqueous liquid waste can include entrained solids or suspensions, provided that Best Practicable Means have been used to remove such solid suspensions from the waste stream.

⁹ This does not mean that dilution *per se* is not allowed. Dilution of some low concentration waste streams by large volumes of uncontaminated water is a feature of many sites and it is not intended that this engineering practice is discontinued. Radioactive waste streams should be assayed or estimated prior to such dilution to ascertain whether the concentration is above or below exemption thresholds.

Conditions

3.27 In order for liquid radioactive waste to be exempt from permitting, all of the following conditions need to be applied:

- The total volume of aqueous waste disposed in any year does not exceed 3000m³.
- Keep an adequate record of such waste which the person disposes on or from any premises.

3.28 When aqueous waste has been disposed of, it is effectively beyond the control of the disposer. This condition is such that the disposer can demonstrate that he/she has exercised control over the waste, and to allow future dose assessments or verification of dose assessment models to be carried out if necessary.

- Allow the regulator access to such records or such premises as the regulator may require in order to determine that the above conditions are being complied with.
- Where it is aqueous waste described in Table 3, dispose by sending it from the premises where the disposal occurs to a sewer using a suitable pipeline.

3.29 In Table 3, the aqueous waste disposal radiological impact assessments are based on small scale disposals from, say a medical facility, in which the waste is disposed to a sewer. Other pathways to human dose (for instance, disposal to a soakaway) are not covered by the impact assessment, and thus other disposal routes are not exempt.

- Where it is other aqueous waste as described in table 4 dispose by discharge via a suitable pipeline.

3.30 This condition is intended to ensure that aqueous waste disposals are controlled and the waste is not disposed of to, say, a soakaway. Use of the words 'suitable pipeline' means a pipeline which delivers the aqueous waste to a sewer, collection facility or to a watercourse where it is diluted with substantial quantities of non-radioactive water.

Exemption of gaseous radioactive waste disposal

Exemptions

3.31 The disposal of **gaseous**¹⁰ waste means waste which has adventitiously arisen from a chemical process involving solid or liquid radionuclides listed in Table 1, employing quantities (annually) or concentrations of radioactive material no greater than those in Table 1. In this context, the term 'adventitious' means that the generation of radioactive gas is not the sole or main purpose of the chemical process in question.

3.32 This is intended for small-scale laboratory procedures or analysis; if a person is using quantities (on a maximum annual basis) or concentrations of radioactive material

¹⁰ Gaseous waste streams may contain solid particulates or liquids in aerosol form provided that Best Practicable Means have been used to remove such solid and liquid components from the gaseous waste stream.

which are exempt from 'keeping and use' requirements, then gaseous waste arising from such use should also be exempt from 'disposal' requirements.

Conditions

- 3.33 In respect of the disposal of gaseous radioactive waste, a person must, where the waste arises in a building cause, so far as is reasonably practicable make the disposal by means of an extraction system which removes the waste from the area where it is being used for disposal to atmosphere and in all cases (whether in or out of a building) prevent, so as reasonably practicable, its entry into any building.
- 3.34 As set out in paragraph 3.32, this provision is intended for small scale disposal of radioactive gases from, say, laboratory experiments. If there is a fume hood available in the laboratory, then good practice (and this condition) require that the fume hood be used, and that the process is not carried out on an open bench.

NORM waste

Exemptions

- 3.35 Special provisions are in place for high volume Low Level Radioactive Waste (LLW) comprising Naturally Occurring Radioactive Material (NORM) arising from industrial activities or land remediation. Examples include some pipe scale from the offshore oil and gas sector, the manufacture of titanium dioxide, and the remediation of land contaminated by radionuclides as a consequence of past practices. These low-risk activities are cases where there have been significant disposals historically, and yet with trivial consequences in the radiation dose experienced.
- 3.36 Specifically in the case of NORM wastes:
- The disposal of NORM waste is exempt where the concentration level does not exceed 5 Bq/g and where for a concentration at or below that level, the quantity a year disposed of is no more than 10,000 Tes per year for any wastes containing the listed radionuclides at the maximum concentration.
- 3.37 This exemption provision is based on a generic radiological impact assessment which looked at a wide range of likely scenarios for disposal of such wastes to landfill. The assessment also considered interim waste disposal practices such as waste sorting and activities at waste transfer stations, as well as disposals below ground (but not necessarily in a landfill). The concentration values apply equally to such activities, but **not** to disposal by way of incineration.
- NORM waste which is not accommodated by the above, where the concentration of such radionuclides does not exceed 10 Bq/g and:

- The person disposing of the waste has made a written disposal-specific radiological assessment in respect of the place where the waste is disposed of.
- That assessment demonstrates that radiation doses are not expected to exceed 1mSv a year to a worker at the place of disposal and 300µSv a year to a member of the public.
- That assessment is provided to the environmental regulator at least 28 days before the first disposal is made.
- No objection has been made in writing by the environmental regulator to that assessment.

3.38 This provision is intended to allow the disposal of large volumes of LLW NORM wastes from industrial activities in the UK where the disposer of the waste can demonstrate that the radiological protection criteria have been met. This is the one case in the exemptions regime where the environmental regulator requires notification, although a formal permit under the legislation is not required.

Conditions

3.39 The conditions applying to disposal of NORM wastes are the same as those for the disposal of solid radioactive wastes set out above.

Exemption for accumulation of radioactive waste

Exemptions

- 3.40 In order to calculate upper levels for accumulation, it does not matter whether the radioactivity is in the form of a 'material' or a 'waste' for the purposes of accumulation; it is the total quantity of activity on the premises which is limited, in the first case by Table 1, based on Annex 1 values of BSSD, and in the second case by the total holdings in Table 2 of sealed sources, bulk wastes etc.
- 3.41 A person is exempt from permitting (accumulation of radioactive waste) of the legislation in respect of the radioactive waste where: **any** of the following descriptions apply:
- The quantities of radionuclides in the waste, when added to the quantities of radionuclides in any radioactive material on the premises, do not exceed the values in column 2 of Table 1 and the quotient value of all radionuclides in the radioactive waste and radioactive material, as determined by the Table 1 summation rule, is less than or equal to one.
 - The numbers of waste items, when added to the numbers of non-waste items, do not exceed the values in column 3 of Table 2.
 - The waste is NORM waste not exceeding an activity on any premises of 1×10^{10} Bq.

Conditions

All of the following conditions need to be applied:

- **Keep an adequate record of the radioactive waste which the person accumulates.**

3.42 Explanation as in paragraph 3.9.

- **Ensure that where practicable the radioactive waste or the container of such waste is marked or labelled as radioactive waste.**

3.43 Explanation as in paragraph 3.11.

- **Dispose of the radioactive waste as soon as practicable after it has become waste.**

3.44 Decay storage is an acceptable method of initially managing radioactive waste if the subsequent management is made easier by such a process. Radioactive wastes may be decay-stored provided that the sole purpose of such decay storage is to allow the waste to be more manageable and that decay storage is carried out in a dedicated location, with adequate records relating to the radioactive inventory.

3.45 In any decision to undertake decay storage as a means of managing radioactive waste, consideration of the benefit of such decay must be weighed against the risks, including possible increase in radiation dose to persons (workers) on the premises, and the increased likelihood of theft.

3.46 Decay storage is not acceptable if the sole purpose of storage is to defer the cost of disposal to the future.

3.47 Decisions on disposal timings should be taken on the basis of:

- The waste hierarchy, taking into account considerations of reuse, recycle, waste minimisation etc.
- Radiation dose to persons (workers) on the premises responsible for waste store management etc.
- Minimising the number of radioactive waste transfers; that is, time may be allowed, within reason, for making up a full load for transport.
- Contractual agreements with waste disposers, including financial considerations; that is, within reason, some accumulation prior to disposal may be acceptable in order to minimise overall disposal costs.

- **Dispose of a sealed source, a tritium foil source or an electrodeposited source within 26 weeks of it becoming waste unless the regulator advises in writing that a longer period of accumulation may take place.**

3.48 The notes on decay storage in paragraphs 3.44-3.45 also apply here, but the decay storage of waste sources is not exempted ***if the sole purpose of such storage is to delay the costs of disposal to the future.***

- **Store safely and securely the radioactive waste to prevent, so far as possible accidental removal, loss or theft from the premises where the person accumulates it or loss of containment.**
- **In respect of an incident of loss or theft, or suspected loss or theft, of the radioactive waste, notify the incident to the regulator as soon as practicable.**

3.49 Explanation as in paragraph 3.14.

- **Where any loss of containment takes place or is suspected to have taken place, notify the incident to the regulator as soon as practicable.**

3.50 Explanation as in paragraph 3.13.

- **Allow the regulators access to such records or such premises as they may require in order to determine that the above conditions are complied with.**

3.51 As with the solid waste disposal conditions, there are persons who receive radioactive waste (premises used for management etc. of bulk wastes which are not radioactive) for burial on land or incineration but who may be unaware of the presence of very low concentrations of radioactivity. The exemption conditions set out above **do not apply** in such cases.

Storage in transit

Exemptions

3.52 Radioactive material or waste which is being temporarily stored during transport between two destinations, both of which are either permitted to hold/receive such material or waste, or are exempt under the provisions of the legislation, is regulated under transport regulations (or exempted under those regulations). This provision is included in the exemptions legislation so as to avoid double regulation. It is intended for situations, for instance, where a transporter has to park overnight in the course of a journey. It is not intended for depots or warehouses used for temporary storage of materials or wastes.

Conditions

3.53 Exemptions from requirements for solid waste and materials are conditional. The conditions are not entirely appropriate for the storage in transit exemptions. The following conditions apply to this particular exemption:

- **To be considered as ‘storage in transit’ radioactive materials or wastes must not be removed from packages or containers.**

3.54 If packages are opened, then a reasonable interpretation would be to the effect that ‘keeping and use’ or ‘disposal’ was being undertaken. The materials or waste would not be ‘stored in transit’.

- **Suspected loss or theft, or situations where the package or container has been broken open or damaged and which could lead to an increase in radiation dose to a member of the public or increase environmental concentrations of radionuclides, must be notified to the environmental regulator as soon as practicable.**

3.55 Explanation as in paragraphs 3.13- 3.14.

- **Allow the environmental regulator access to such records or such premises as it may require in order to determine that the above conditions are being complied with.**

4. Calculation aspects

Relationship between 'out of scope', 'exempt' and 'permitted'

- 4.1 This section explains the relationship between radioactive substances and wastes that are:
- Outside the scope of regulation.
 - Exempted from the requirement for a permit under the Exemption Order.
 - Subject to a requirement for a permit for their keeping or use (radioactive material) or disposal or accumulation (radioactive waste) under the legislation.
- 4.2 Some common situations are set out here, but it is recognised that not every unique combination of circumstances can be precisely defined.

Disposal of radioactive waste

- 4.3 For any one waste stream, arising from any one particular process, if the 'out of scope' level is X and the exemption level is Y, then:
- A concentration below X is not treated as radioactive; no conditions apply.
 - If the concentration is between X and Y, the waste is exempt, but the conditions in the exemption apply to **all of the waste**.
 - If the concentration is greater than Y, then the permit conditions apply to **all of the waste**. The permit will make this clear. The most important permit condition will relate to the BAT (BPM) condition for waste minimisation, which logically and obviously has to apply to the entire inventory of waste.
- 4.4 The reason for this interpretation is that although, strictly, some waste may be outside the scope of the regulations because it is below the levels in Table 1 or Table 2 of Schedule 1, it is not practical to deduct this excluded element from consideration of the waste as a whole.
- 4.5 The 'out of scope' levels and the exemption levels are based on the calculated values after removing background, if possible, in the specific circumstances. It will be incumbent on the operator to either:
- Use the total measured value of any waste stream, or
 - Be able to demonstrate, if challenged, if and how, by calculation, it is appropriate to deduct the component due to background.

- 4.6 If a site operator holds a permit for discharges of radioactive waste to **any one medium**, then the permit conditions apply to all discharges from the same process. This is because the BAT principle cannot be applied (by way of permit conditions) to one or two media in isolation; all discharges have to be taken into account in order to satisfy this condition.
- 4.7 Separate processes, however, giving rise to separate waste streams, can be treated on their own for the purposes of the above paragraphs. An example would be where a practice on a site gives rise to tritium contaminated water for disposal. If, on the same site, tritium contaminated groundwater is being removed from an excavation, then this is clearly a separate process which gives rise to a separate waste stream.

Keeping and use of radioactive substances

- 4.8 The levels from Annex 1 of BSSD, reproduced in Table 1 of the Exemption Order, should be the first port of call for any person who believes that their holdings are, or might be, exempt. If the levels in this table are exceeded, then reference may be made to Table 2 in the circumstances, and for materials, described in that table.
- 4.9 For Table 2 of the Exemption Order, the exemption levels apply to each row; that is, for instance, any one premises will be exempt from permitting for up to 4.0×10^5 Bq of Ba-137m eluting sources **plus** unlimited number of fixed smoke detectors **plus** 5×10^{12} Bq of class A GTLDs.
- 4.10 However, for any **one particular row** in Table 2, suppose the exemption level is X sources of a certain type; this means that we believe that the keeping of X sources is a low risk activity provided that the exemption conditions are complied with. If an operator wishes to keep and use X+1 sources, then a permit is required for X+1 sources, and not 1 source. This is because we believe that for an operator to hold X+1 sources, the exemption conditions do not provide sufficient guarantees of safety; the conditions in the permit need to apply to X+1 sources.
- 4.11 The same argument applies to the special provisions for medical and veterinary practices. If the exempt levels are exceeded, then a permit will be required for all of the holdings, and not just the quantum of holdings above the exempt levels.

Aggregation

- 4.12 For mixtures of radionuclides, simple aggregation (summation) rules apply. The summation rule means that the sum of the quotients of A/B or C/D should be less than or equal to one where:

“A” means the quantity of each radionuclide listed that is present in the material or waste;

“B” means the stated quantity of that radionuclide specified;

“C” means the concentration of each radionuclide listed that is present in the material or waste;

“D” means the stated concentration of that radionuclide specified.

4.13 For **quantities**:

$$\sum (A_1/B_1 + A_2/B_2 \dots) \leq 1$$

4.14 For **concentrations**:

$$\sum (C_1/D_1 + C_2/D_2 \dots) \leq 1$$

Averaging and assay for radioactive waste

4.15 In general the levels in the Schedule 1 and Exemption Order tables apply to waste as measured at the point of arising.

4.16 Where radioactive material is chemically or mechanically processed prior to disposal, averaging of concentrations over reasonable quantities of (non-radioactive) waste in mixtures is permissible, but deliberate dilution to render a mixture of waste below the relevant levels is not. The regulators will provide guidance on sampling and averaging in such cases.

Discounting of ‘normal’ background

4.17 Any substance or article is not regarded as radioactive material or radioactive waste unless the concentration of any artificial radionuclide is above the levels *‘found normally in such a substance’*¹¹.

4.18 The prime purpose of this provision is to remove from the need for regulation materials and wastes containing radionuclides which are not amenable to controls because of their ubiquitous presence in the earth, its waters or atmosphere. The concept applies to anthropogenic radionuclides found in naturally occurring materials. For instance, due to historical atmospheric weapons tests and the Chernobyl accident, certain fission products are in global circulation. Obviously, such radioactivity is not amenable to control. Neither is the radioactivity in rainwater arising from the presence of these anthropogenic radionuclides in the atmosphere.

4.19 Practical considerations of assay/measurement also need to be taken into account. Waste managers would be expected to use best practicable means to determine the radiochemical assay of the waste, but where the difference between the level *‘found normally in such a substance’* and the increment due to additional contamination

¹¹ Note that, for natural radionuclides, background levels are already excluded when the material in question, or wastes arising, are not being used in an ‘industrial activity’ or a practice.

genuinely cannot be separated or reasonably measured, then the entire material can be considered as 'outside scope'.

Unlisted radionuclides

4.20 The methods used in the RP series of Euratom documents to calculate 'out of scope' levels for solids have been used by HPA in the calculation of liquid and gaseous levels for naturally-occurring radionuclides (Table 1 of the legislation) and the exemption levels for aqueous liquids (Table 4 of the Exemption Order). Persons disposing of radioactive wastes may use these methods and apply them to any unlisted artificial radionuclides to calculate an 'out of scope' or exemption level for any radionuclide (solid, liquid or gas).

'Head of chain' etc. calculations

4.21 "m" where it appears after a radionuclide means a radionuclide in a metastable state of radioactive decay in which gamma photons are emitted. In many cases, the daughter of such a decay, if itself radioactive, is already included in the dose assessment calculations and need not be assessed separately.

4.22 '+' where it appears after a radionuclide means that, for the purpose of calculations, the radionuclide includes such of its daughter radionuclides in the decay chain that are relevant for the purposes of radiological impact assessment. These daughter radionuclides are listed in the relevant tables.

4.23 'sec' where it appears after a radionuclide means that, for the purpose of calculations, all radionuclides in the decay chain in secular equilibrium have been taken into account for the purposes of radiological impact assessment.

4.24 The 'dustbin disposal route' includes all matters described in Table 3 of the Exemption Order. For calculations involving [this](#) low volume Very Low Level Radioactive Waste (the 'dustbin disposal route'), the 4Bq/g level, and other values in Table 3 of the Exemption Order, [apply](#) to the total activity in the waste. Note that these particular provisions are intended for small-scale disposals of mainly fission product material from, say, hospitals or research establishments. They are not intended for bulk disposals of, say, contaminated NORM wastes.

4.25 That is, should, for instance, natural uranium in equilibrium with its daughters be present in a 'dustbin disposal' waste stream, then the concentration of all individual radionuclides in the relevant decay chains must be added together and compared to the 4Bq/g level.

4.26 For all other situations, the head of the chain may be taken to already include all radionuclides in a decay chain (in the case of radionuclides followed by the term 'sec'), or all the listed radionuclides (in the case of the term '+').

4.27 These situations are:

- Calculations of 'out of scope' levels for industrial activities in Table 1 of Schedule 1.
- Calculations of 'out of scope' levels for practices in Table 2 of Schedule 1.
- Calculations of total holdings for keeping and use in Tables 1 and 2 of the Exemption Order.
- Calculations for aqueous waste disposal in Table 4 of the Exemption Order.
- Calculations for generic high volume low level radioactive waste disposals containing NORM radionuclides.

4.28 Note that for the bespoke high volume LLW disposals, for which a case-specific calculation of activity and dose is required, use of 'head of chain' values or 'total activity' values are a matter for the applicant.

5. General considerations

Decision to use exemption provisions

- 5.1 Users of radioactive substances, and disposers of radioactive waste, need to decide whether or not they are outside the scope of the legislation, or whether exemptions apply to them. This is solely a user decision, but the regulator may take a view on correctness of such a decision. These decisions, and the reasons for them, should be documented.

Discussion with regulators

- 5.2 The principle of exemption, according to the Basic Safety Standards Directive, means that no prior reporting is necessary. However, users may wish to discuss any issue relating to radioactive substances and waste, whether permitted or not, with the environmental regulators, although the responsibility for this decision rests with the user. In the case of exempt waste or material, the regulators may advise on compliance with the exemption conditions on request. In exceptional circumstances, on request by a user, the regulator may issue a permit for matters which are actually exempt. Note that a permit which is issued for any reason will automatically cover all materials and wastes, whether exempt or not.

Status of exempt waste under other legislation

- 5.3 Some radioactive waste may exhibit hazardous properties not related to its radioactive properties. For waste which is conditionally exempted from the need for permitting, waste disposers need to be aware of the hazardous properties of the waste and take appropriate action¹². This action may include a consideration of other waste legislation.

Action and reporting on non-compliance

- 5.4 Any person relying on exemption provisions, on knowing or suspecting that any exemption condition has not been met, for any reason, must:

¹² In England and Wales, wastes which are exempt from prior reporting and permitting are not exempt from other waste legislation. In Scotland, this measure will be effected on implementation of the Waste Framework Directive.

- Make efforts to remedy the situation by changing procedures or practices such that the conditions are met.
- Notify the environmental regulator.

Regular review of compliance by user

- 5.5 Users of radioactive materials and disposers of radioactive waste are encouraged to check (audit) their procedures and practices at regular intervals to ensure that they are compliant with exemption conditions.

Regulatory role in compliance checking of exemption conditions

- 5.6 The exemptions regime does not involve notification to the environmental regulators (except in the specific circumstances of high volume NORM waste for which a case-specific radiological impact is required). However, the regulators may inspect any premises where they know or suspect that radioactive substances are being held, or radioactive waste is undergoing storage or disposal, and inspect procedures, practices and records against the exemption conditions.
- 5.7 Such inspections are likely to be infrequent: the purpose of the exemptions regime is to enable the regulators to focus their resources on higher-risk activities in a proportionate manner, and not expend undue effort on the lower-risk activities for which the exemptions regime was designed.

Annex 1: Background to the regime

History

1. The 'keeping and use' of radioactive substances and the 'accumulation and disposal of radioactive waste' in the UK currently generally requires a permit under the Radioactive Substances Act 1993 in Scotland and Northern Ireland, and the Environmental Permitting (England and Wales) Regulations 2010 (EPR10).
2. However, prior to the 2011 amendments, this permitting was not required for certain naturally-occurring radioelements, below certain concentration levels. The phrasing used in this guidance in relation to this concept is 'outside the scope of regulation'.
3. In addition, exemptions from some or all of the obligations under the legislation had been made by way of a number of exemption orders (and giving these orders equivalent effect in the EPR) where the risks resulting from a widespread practice or other use of substances (and the subsequent disposal of the radioactive waste) had been considered low enough that full regulatory controls were not deemed necessary. Such exemptions were in some cases subject to certain conditions being met.
4. The 2011 amendments in relation to substances which are outside the scope of regulation or exempted from regulation represents a rationalisation of this regime by:
 - Clarifying what is and is not within the scope of the legislation, and what is exempted from the requirement for a permit, in particular by: modifying the legislation to incorporate a list of numerical activity limits for radionuclides below which the provisions of the legislation do not apply; and introducing the concept of an 'industrial activity' which applies to Naturally Occurring Radioactive Materials (NORM).
 - Revoking all extant Exemption Orders and replacing them with one Exemption Order. The new Order incorporates a suite of numerical exemptions in which the exemption depends upon an upper level for radionuclide concentration, total activity or, in some cases (for instance, for radioactive sealed sources), numbers of items. All exemptions in the Order are subject to conditions.
 - Clarifying and removing various anomalies.
 - Using modern and internationally understood terms so that the legislation transposes more clearly and consistently the requirements of the Basic Safety Standards Directive (BSSD) and international best practice as set out in commonly agreed definition of terms by the International Commission For Radiation Protection (ICRP).

International definitions

5. The following definitions of the terms 'exclusion', 'clearance' and 'exemption' are taken from IAEA, 1996: International Basic Safety Standards for Protection Against Ionising Radiation and the Safety of Radioactive Sources: Safety Series 15, Vienna.

6. **Exclusion** is defined as:

'The deliberate exclusion of a particular category of exposure from the scope of an instrument of regulatory control on the grounds that is it not considered amenable to control through the regulatory instrument in question'.

7. **Clearance** is defined as:

'The removal of radioactive materials or radioactive objects within the authorised practices from further regulatory control'.

8. **Exemption** is defined as:

'The determination by a regulatory body that a source or practice need not be subject to some or all aspects of regulatory control on the basis that the exposure due to the source or practice is too small to warrant the application of those aspects'.

9. Euratom has developed these concepts further to derive numerical values for both 'clearance' and 'exemption'. Clearance levels have been published in Euratom Radiation Protection Series Documents 122 parts one and two (although these publications do not constitute any part of Euratom legislation). Exemption levels, as well as criteria for the creation of new exemptions by member states, are set out in Annex 1 of the BSSD.

The UK approach to exclusion, clearance and exemption

Exclusion and clearance

10. In practice, the effect of both 'exclusion' and 'clearance' is the same. For the purposes of the new UK legislation 'exclusion' and 'clearance' are therefore treated in the same way: as removal from the scope of regulation. The effect achieved by the legislation is that substances and articles are not subject to regulatory controls where they:

- are not amenable to control; or
- have radionuclide concentrations below the RP 122 (or equivalent) clearance levels.

11. These levels are a feature of the legislation, and appear as Table 1 of the legislation (dealing with naturally occurring radionuclides used in industrial activities) and Table 2 (dealing with [practices]). The levels for solids are taken directly from documents RP122 parts one and two, as referred to above. The levels for aqueous liquids and gases in Table 1 have been derived by the Health Protection Agency for the purposes of this legislation using similar methods to those employed by Euratom in the derivation of their solid concentration levels.

12. Note that for naturally occurring radionuclides used in any activity which is not defined as a 'industrial activity' (see Table 3 of the legislation), or is not a practice (that is, any activity relating to the fertile, fissile or radioactive properties of a substance or article), the legislation does not require any controls. Any activity which is not in these two categories is thus outside the scope of the legislation, the activity in question has not been identified in BSSD as one which creates significant exposure. Government may, from time to time, add to or delete from this list.

Exemptions

13. For substances and articles which are defined as radioactive (i.e. the radionuclide concentrations are above the 'out of scope' levels), a second set of numerical levels (exemption levels) are set out in the legislation (Table 1 of the Exemption Order). Exemption levels are generally given as concentrations of radionuclides in a substance or article, but there are also levels for total quantities of any substance held on any particular premises. In both cases, these levels apply to a substance or article in any of the common physical forms (solid, liquid or gas).
14. These exemption levels in this table are taken directly from the BSSD Annex 1. They are used to exempt an activity in relation to a substance or article from the need for permitting, but the activity is subject to exemption conditions.
15. In addition to setting out numerical exemption levels, the BSSD allows Member States to introduce other exemptions for low-risk activities and substances, subject to certain criteria (dose criteria) being satisfied. The UK legislation uses this provision to set out such additional exemptions. These additional exemptions are set out in Table 2 of the Exemption Order. The additions are based on existing (pre-2011) exemptions for such things as, for example, certain low-activity sealed sources, including luminised articles incorporating tritium up to certain activity limits.
16. The exemption levels set out in BSSD Annex 1, which are reproduced in Table 1 of the Exemption Order, are applicable to the keeping and use of radioactive materials. Waste disposal criteria (concentration or mass limits, disposal methods and conditions relating to disposal) are set out in the Exemption Order, and particularly in Tables 3 and 4 of the Order. These disposal criteria have been developed in the UK, are based to large extent on the Government's policy statement on low level radioactive wastes (2007), and are supported by radiological impact assessments carried out by the Health Protection Agency. In accordance with Article 5 of the Directive, these numbers have been derived using the basic criteria set out in Annex 1 of the Directive and Euratom guidance.

Annex 2: Table relating Exemption Orders in force to 2010 with the exemptions provisions proposed from 2011

Exemption Order in Force 2010: Electronic valves (1967)			
Provisions for 'keeping and use':			
1. Class 1 and class 2 valves incorporated into equipment are exempt (see table in next section). Summation rule applies.			
2. Loose class 2 valves are limited to 10 per premises. Summation rule applies.			
Proposals:			
To be treated as sealed sources.			
Radionuclide	2010 exemption limit (Class 1 valves)	2010 exemption limit (Class 2 valves)	2011 proposed limit
Co-60	$3.7 \times 10^3 \text{Bq}$	$3.7 \times 10^4 \text{Bq}$	$4 \times 10^6 \text{Bq}$ per item. $2 \times 10^8 \text{Bq}$ per premises
Ni-63	$3.7 \times 10^3 \text{Bq}$	$3.7 \times 10^4 \text{Bq}$	$4 \times 10^6 \text{Bq}$ per item. $2 \times 10^8 \text{Bq}$ per premises
Cs-137	$3.7 \times 10^3 \text{Bq}$	$3.7 \times 10^4 \text{Bq}$	$4 \times 10^6 \text{Bq}$ per item. $2 \times 10^8 \text{Bq}$ per premises
Th (nat)	$3.7 \times 10^3 \text{Bq}$	$3.7 \times 10^4 \text{Bq}$	$4 \times 10^5 \text{Bq}$ per item. $2 \times 10^7 \text{Bq}$ per premises
Tl-204	$3.7 \times 10^3 \text{Bq}$	$3.7 \times 10^4 \text{Bq}$	$4 \times 10^6 \text{Bq}$ per item. $2 \times 10^8 \text{Bq}$ per premises
Ra-226	$3.7 \times 10^3 \text{Bq}$	$3.7 \times 10^4 \text{Bq}$	$4 \times 10^5 \text{Bq}$ per item. $2 \times 10^7 \text{Bq}$ per premises
U (nat)	$3.7 \times 10^3 \text{Bq}$	$3.7 \times 10^4 \text{Bq}$	$4 \times 10^5 \text{Bq}$ per item. $2 \times 10^7 \text{Bq}$ per premises
C-14	$3.7 \times 10^4 \text{Bq}$	$3.7 \times 10^5 \text{Bq}$	$4 \times 10^6 \text{Bq}$ per item. $2 \times 10^8 \text{Bq}$ per premises
Cl-36	$3.7 \times 10^4 \text{Bq}$	$3.7 \times 10^5 \text{Bq}$	$4 \times 10^6 \text{Bq}$ per item. $2 \times 10^8 \text{Bq}$ per premises
Pm-147	$1.8 \times 10^5 \text{Bq}$	$1.1 \times 10^6 \text{Bq}$	$4 \times 10^6 \text{Bq}$ per item.

			2x10 ⁸ Bq per premises
Kr-85	3.7x10 ⁵ Bq	3.7x10 ⁶ Bq	4x10 ⁶ Bq per item. 2x10 ⁸ Bq per premises
H-3	5.5x10 ⁶ Bq	-	2x10 ¹⁰ Bq per item 5x10 ¹² Bq per premises

Provisions for ‘accumulation and disposal’:

1. Class 1 valves – no limit on disposal. Summation rule applies.
2. Class 2 valves – disposal limited to 10 per week. Summation rule applies.

Proposals:

To be treated as sealed sources.

Radionuclide	2010 exemption limit (Class 1 valves)	2010 exemption limit (Class 2 valves)	2011 proposed limit
Co-60	3.7x10 ³ Bq – no disposal limit.	3.7x10 ⁴ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
Ni-63	3.7x10 ³ Bq – no disposal limit.	3.7x10 ⁴ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
Cs-137	3.7x10 ³ Bq – no disposal limit.	3.7x10 ⁴ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
Th (nat)	3.7x10 ³ Bq – no disposal limit.	3.7x10 ⁴ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
Tl-204	3.7x10 ³ Bq – no disposal limit.	3.7x10 ⁴ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
Ra-226	3.7x10 ³ Bq – no disposal limit.	3.7x10 ⁴ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
U (nat)	3.7x10 ³ Bq – no disposal limit.	3.7x10 ⁴ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
C-14	3.7x10 ⁴ Bq – no disposal limit.	3.7x10 ⁵ Bq – 10 per week disposal limit	2x10 ⁵ Bq per 0.1m ³ . 1x10 ⁷ Bq/year
Cl-36	3.7x10 ⁴ Bq – no disposal limit.	3.7x10 ⁵ Bq – 10 per week	2x10 ⁵ Bq per 0.1m ³ .

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		disposal limit	1×10^7 Bq/year
Pm-147	1.8×10^5 Bq – no disposal limit.	1.1×10^6 Bq – 10 per week disposal limit	2×10^5 Bq per 0.1 m^3 . 1×10^7 Bq/year
Kr-85	3.7×10^5 Bq – no disposal limit.	3.7×10^6 Bq – 10 per week disposal limit	2×10^5 Bq per 0.1 m^3 . 1×10^7 Bq/year
H-3	5.5×10^6 Bq – no disposal limit.	-	2×10^{10} Bq per 0.1 m^3 . 1×10^{13} Bq/year
Additional notes:			

Exemption Order in Force 2010: Exhibitions (1962)		
Provisions for 'keeping and use':		
<p>Limited to certain types of premises.</p> <ol style="list-style-type: none"> 1. 'Homogenous source' limited to 3.7×10^5 Bq, no alpha emitters 2. 'Sealed source' limited to 3.7×10^7 Bq 3. 'Open source' limited by radionuclide (see table in next box) 		
Proposals:		
<p>Available for all premises.</p> <ol style="list-style-type: none"> 1. 'Homogenous source' now treated as a sealed source, limited to 4.0×10^5 Bq alpha emitter, or 4.0×10^6 Bq beta emitter, with a premises limit of 2.0×10^7 Bq alpha emitter or 2×10^8 Bq beta emitter. 2. 'Sealed source' limited to 4.0×10^5 Bq alpha emitter, or 4.0×10^6 Bq beta emitter, with a premises limit of 2.0×10^7 Bq alpha or 2×10^8 Bq beta emitter. 3. 'Open source' limited by radionuclide as follows: 		
Radionuclide	2010 exemption limit	2011 exemption limit from EO schedule 1, table 1.
H-3	3.7×10^8 Bq	1.0×10^9 Bq
C-14	3.7×10^8 Bq	1.0×10^7 Bq
Na-24	3.7×10^7 Bq	1.0×10^5 Bq
P-32	3.7×10^6 Bq	1.0×10^5 Bq
S-35	3.7×10^7 Bq	1.0×10^8 Bq
Fe-59	3.7×10^6 Bq	1.0×10^6 Bq
Co-60	3.7×10^6 Bq	1.0×10^5 Bq
Sr-90	3.7×10^4 Bq	1.0×10^4 Bq
I-131	3.7×10^5 Bq	1.0×10^6 Bq
Cs-137	3.7×10^6 Bq	1.0×10^4 Bq
Au-198	3.7×10^6 Bq	1.0×10^6 Bq
Ra-226	3.7×10^3 Bq	1.0×10^4 Bq
Provisions for 'accumulation and disposal'		
None		
Proposals:		
<p>'Dustbin disposal' route available – generally up to 4×10^5 Bq per 0.1 m^3 (no single item $> 4 \times 10^4$ Bq), with an annual limit of 2×10^8 Bq, or an order of magnitude higher in the case of C-14 and H-3. Sealed source disposal limit of 2×10^5 Bq per 0.1 m^3, with an annual limit of 1×10^7 Bq. Higher limits for specific items containing H-3 or Pm-147.</p>		
Additional notes:		



Exemption Order in Force 2010: Geological specimens (1962)
Provisions for 'keeping and use': Natural minerals containing uranium and/or thorium. 100kg of (uranium + thorium) on the premises.
Proposals: 5kg of (natural or depleted uranium + natural thorium) on the premises.
Provisions for 'accumulation and disposal': <ol style="list-style-type: none">1. 100g of solid (uranium + thorium) per day.2. 2g of solid + liquid (uranium + thorium) per month.
Proposals: Disposal of 0.5kg of (natural or depleted uranium + natural thorium) per week.
Additional notes:

Exemption Order in Force 2010: Gaseous Tritium Light Devices (1985)**Provisions for 'keeping and use':**

See table in next section for a comparison of 2010 provisions with proposals.

Proposals:

GTLDs to be treated as sealed sources, but with particular exemptions as set out below.

Type	2010 activity per item	2010 activity per premises	2011 activity per item	2011 activity per premises
Class A	2×10^{10} Bq	5×10^{12} Bq	2×10^{10} Bq	5×10^{12} Bq
Class B	1×10^{12} Bq + limit on individual components.	3×10^{13} Bq	1×10^{12} Bq (no individual component limit)	3×10^{13} Bq
Class C	No limit	No limit	1×10^{12} Bq	No limit

Provisions for 'accumulation and disposal'

Disposal of 1 Class A GTLD (2×10^{10} Bq) per 0.1 m^3 . No annual disposal limit.

Proposals:

1. Disposal as 'individual sealed source containing only tritium as radioactive component' of 2×10^{10} Bq per 0.1 m^3 .
2. Annual disposal limit 1×10^{13} Bq.

Additional notes:

<p>Exemption Order in Force 2010: Hospitals (amended 1995)</p> <p>Provisions for ‘keeping and use’:</p> <ol style="list-style-type: none"> 1. No alpha emitters. 2. Open sources up to 1×10^9 Bq Tc-99m on any premises. 3. Open sources up to 2×10^7 Bq Iodine isotopes on any premises. 4. Open sources excluding Tc-99m but including Iodine isotopes, up to 1×10^8 Bq.
<p>Proposals:</p> <ol style="list-style-type: none"> 1. Proposals extended to veterinary practices, and clarity that clinical trials are included in the exemptions. 2. Open sources up to 1×10^9 Bq Tc-99m on any premises. 3. Open sources up to 1×10^8 Bq all other radionuclides (including Iodine isotopes and alpha emitters) on any premises.
<p>Provisions for ‘accumulation and disposal’:</p> <ol style="list-style-type: none"> 1. No disposal of alpha emitters. 2. 4×10^5 Bq total activity per 0.1 m^3, with a maximum of 4×10^4 Bq per article 3. Disposal by burning of 2.5×10^7 Bq (H-3 + C-14) per month. 4. Disposal by burning of 5×10^6 Bq all other radionuclides per month. 5. 1.0×10^9 Bq of Tc-99m as human excreta per month. 6. 5×10^8 Bq of all other radionuclides as human excreta per month. 7. 5×10^7 Bq of all radionuclides as aqueous waste per month (other than human excreta).
<p>Proposals:</p> <ol style="list-style-type: none"> 1. Alpha emitter restriction removed. <p>2/3/4. ‘Dustbin disposal’ route available – generally up to 4×10^5 Bq per 0.1 m^3 (no single item $> 4 \times 10^4$ Bq), with an annual limit of 2×10^8 Bq, or an order of magnitude higher in the case of C-14 and H-3. Sealed source disposal limit of 2×10^5 Bq per 0.1 m^3, with an annual limit of 1×10^7 Bq.</p>

Higher limits for specific items containing H-3 or Pm-147.

3/4. Disposal by incineration of organic solutions containing only C-14 and/or H-3 of up to 1×10^2 Bq/ml, with an annual limit of 1×10^6 Bq.

5. 1.0×10^{10} Bq for Tc-99m as human excreta per year.

6. 5.0×10^9 Bq for all other radionuclides as human excreta per year.

7a. 1×10^2 Bq/ml for aqueous wastes, with an annual limit of 1×10^8 for low radiotoxicity isotopes.

7b. 1×10^2 Bq/ml for aqueous wastes containing all other radionuclides, with an annual limit of 1.0×10^6 Bq.

7c. Other aqueous disposal exemption limits are radionuclide specific, as per EO schedule 1, table 4.

Additional notes:

Exemption Order in Force 2010: Lead (1962)
Provisions for ‘keeping and use’: 1. Natural lead (of a certain description) is exempt from permitting with no limits or conditions for all undertakings.
Proposals: Excluded (outside the scope of the Act) by virtue of: 1. Use of natural lead is not a work activity. 2. Concentrations are not greater than those found ‘normally in natural materials.’
Provisions for ‘accumulation and disposal’ 1. Natural lead (of a certain description) is exempt from permitting with no limits or conditions for all undertakings.
Proposals: 1. As for ‘keeping and use’
Additional notes:

Exemption Order in Force 2010: Luminous articles (1986)
Provisions for ‘keeping and use’: <ol style="list-style-type: none">1. Item limit of 8×10^7 Bq Pm-147 or 4×10^9 Bq H-3.2. Premises limit of 4×10^{10} Bq Pm-147 or 2×10^{11} Bq H-3.
Proposals: Exactly the same provisions as above (2010 position) with the exception that ‘luminous articles’ has been changed to ‘luminised articles’.
Provisions for ‘accumulation and disposal’: Individual luminous articles described above can be disposed of up to a maximum of 10 per week from any premises.
Proposals: <ol style="list-style-type: none">1. Individual luminised articles as described above to be disposed of 1 per 0.1m^3.2. Annual disposal limit of 2×10^9 Bq Pm-147 (25 articles at the maximum) or 1×10^{11} Bq H-3 (25 articles at the maximum).
Additional notes:

Exemption Order in Force 2010: Natural gas (2002)
Provisions for 'keeping and use': Natural gas containing Rn-222 and/or its decay products to a maximum of 5Bq/g for each radionuclide.
Proposals: Excluded (outside the scope of the Act) by virtue of: <ol style="list-style-type: none">1. Distribution and use of natural gas is not a work activity.2. Concentrations are not greater than those found 'normally in natural materials'.
Provisions for 'accumulation and disposal'; Disposal of natural gas or products derived from natural gas up to a maximum of 5Bq/g for each radionuclide.
Proposals: As for 'keeping and use'.
Additional notes:

Exemption Order in Force 2010: Precipitated phosphate (1963)
Provisions for 'keeping and use': Keeping and use of a substance (or mixture which includes such a substance) for application to soil for the purposes of cultivation where: i) Activity of natural uranium (mCi)/Mass of substance (g) $\leq 2 \times 10^{-3}$ ii) Activity of elements [actinium, lead, polonium, protoactinium (not isotope 234), radium, radon, thorium (not isotope 234)](mCi)/Mass of substance (g) $\leq 4 \times 10^{-4}$ iii) Activity of thorium-234 or protoactinium-234 (mCi) does not at any time exceed the activity of that radionuclide which could be present at that time through radioactive decay occurring in the substance,
Proposals: 1. Table 1 values for exemption
Additional notes: It is believed that this Exemption Order is not used.

Exemption Order in Force 2010: Phosphatic Substances and Rare Earths etc (1962)

Provisions:

Schedule 1 radioelements unconditionally limited to 15Bq/g for 'keeping and use' and 'accumulation and disposal'.

Proposals:

1. Reference to 'radioelements' removed and replaced by radioisotope-specific exclusion values in tables 1 and 2 of Schedule 1 to the regulations. There is therefore no direct comparison with the 2010 situation, although 5Bq/g of specific radionuclides in the U-238 and Th-232 decay chains is often taken as a useful rule-of-thumb in the 2010 situation..

2. Exclusion values (equivalent to unconditional exemption): as set out in table 1 of Schedule 1 to the regulations (for NORM radionuclides arising as a consequence of a specified work activity), and in table 2 of Schedule 1 to the regulations (for NORM radionuclides arising as a consequence of a practice).

3. NORM radionuclides arising from any anthropogenic activity which is not a specified work activity or a practice are excluded from regulation.

4. Deduction of 'normal' background from any material or waste is allowed for (this applies to anthropogenic as well as naturally-occurring radionuclides),

5. Disposal of NORM radioisotopes up to 5Bq/g is exempt up to a total of 10,000Tes/year at the maximum (5Bq/g) and pro-rata for wastes of lower activity concentrations.

6. Disposal of NORM radioisotopes up to 10Bq/g is exempt on the basis of a case-specific radiological impact assessment.

Additional notes:

<p>Exemption Order in Force 2010: Schools etc (1963)</p> <p>Provisions for ‘keeping and use’:</p> <ol style="list-style-type: none"> 1. Closed + open sources. Total holding 1.48×10^8 Bq on any premises. 2. Open sources. Total holding 7.4×10^7 Bq on any premises. 3. No more than 7.4×10^7 Bq brought on to any premises in any four-week period.
<p>Proposals:</p> <ol style="list-style-type: none"> 1. Closed source holdings limited to 4×10^5 Bq alpha or 4×10^6 Bq beta per item. 2. Closed source holdings limited to 2×10^7 Bq alpha or 4×10^8 Bq beta on any premises. 3. Open source holdings limited by EO schedule 1 table 1, which are radionuclide specific. The exempt holdings thresholds range from 1×10^9 Bq for H-3 down to 1×10^3 Bq of Pu-240. There are also concentration thresholds for exemption of open sources. 4. Ba-137m eluting sources are exempt up to 4×10^4 Bq of Cs-137 per unit or 4×10^5 Bq of Cs-137 on any premises.
<p>Provisions for ‘accumulation and disposal’:</p> <ol style="list-style-type: none"> 1. No alpha emitters or Sr-90 2. 3.7×10^5 Bq/0.1m³. 3. 3.7×10^4 Bq/item in refuse. 4. 3.7×10^5 Bq/week.
<p>Proposals:</p> <p>‘Dustbin disposal’ route available – generally up to 4×10^5 Bq/0.1m³ (no single item > 4×10^4 Bq), with an annual limit of 2×10^8 Bq, or an order of magnitude higher in the case of C-14 and H-3. Sealed source disposal limit of 2×10^5 Bq/0.1m³, with an annual limit of 1×10^7 Bq. Higher limits for specific items containing H-3 or Pm-147.</p>
<p>Additional notes:</p>

<p>Exemption Order in Force 2010: Smoke detectors (Amended 1991)</p>
<p>Provisions for ‘keeping and use’:</p> <ol style="list-style-type: none"> 1. ‘Loose’ smoke detectors limited to 4×10^4 Bq Am-241 per item, 500 such detectors per premises (max 2×10^7 Bq per premises). 2. ‘Fixed’ smoke detectors limited to 4×10^6 Bq of all radionuclides per item. No limit on numbers per premises.
<p>Proposals:</p> <ol style="list-style-type: none"> 1. ‘Loose’ smoke detectors to be treated as sealed sources. Limited to 4×10^5 Bq per item (alpha), with a premises limit of 2×10^7 Bq. 2. ‘Fixed’ smoke detectors limited to 4×10^6 Bq per item. No premises limit.
<p>Provisions for ‘accumulation and disposal’:</p> <p>Smoke detectors containing up to 4×10^4 Bq Am-241 per item, disposal of each one in 0.1m^3.</p>
<p>Proposals:</p> <p>Treated as sealed sources. Disposal limit 2×10^5 Bq (any radionuclide) per 0.1m^3, with an annual disposal limit of 1×10^7 Bq (any radionuclide).</p>
<p>Additional notes:</p>

Exemption Order in Force 2010: Storage in Transit (1962)
Provisions: Storage in transit is limited to 'packages', with each package limited according to radionuclide content for specified radioisotopes, plus a catch-all 'other radionuclides' of 3×10^7 Bq per package. No limit on overall consignment.
Proposals: No limits on individual 'packages' or overall consignments. SiT provisions now unambiguously apply to both 'materials' and 'wastes'.
Additional notes: Removal of restrictions, as set out in the proposals, is to avoid double regulation by both the environmental and transport regulators. Material or waste stored in the course of transit may be subject to limits in transport regulations, or may be exempted under these regulations.

Exemption Order in Force 2010: Substances of low activity (Amended 1992)

Provisions:

1. Unconditional exemption for keeping and use of all radionuclides with a concentration level of less than 0.4Bq/g for solids.
2. Unconditional exemption for disposal of all radionuclides with a concentration level of less than 0.4Bq/g for solids.
3. Unconditional exemption for disposal of organic liquids containing C-14 and/or H-3 with a concentration level of less than 4Bq/ml.
4. Unconditional exemption for disposal of all radioactive gases with a half-life < 100s.

Proposals:

1. Exclusion (equivalent to unconditional exemption) for solids and non-aqueous liquids is now radionuclide specific, based on schedule 1 table 2. The exclusion thresholds range from 1×10^2 Bq/g for H-3 down to 0.01Bq/g for Po-210.
2. Conditional exemption for 'keeping and use' is radionuclide specific, based on EO schedule 1, table 1. The exemption thresholds range from 1×10^6 Bq/g for H-3 down to 1Bq/g for Pu-239.
3. Conditional exemption for disposal of organic solutions by incineration containing only C-14 and/or H-3 of up to 1×10^2 Bq/ml, with an annual limit of 1×10^6 Bq.
4. All radionuclides in any common physical form with half lives < 100s are excluded.
5. There are provisions for discounting background due to fission products at concentration levels found normally in natural materials.

Additional notes:

Exemption Order in Force 2010: Testing instruments (Amended 2006)**Provisions for 'keeping and use':**

1. Class 1 sources (max activity 2×10^5 Bq any radionuclide) unconditionally exempted. No premises limit.
2. Class 2 sources (see table in next section) unconditionally exempted. No premises limit.

Proposals:

Homogenous sources and laminated sources to come within the definition of 'sealed sources'.

Type	2010 activity limit	2011 activity limit (per item)	2011 activity limit (per premises)
Homogenous source	4×10^5 Bq	4×10^6 Bq beta	2×10^8 Bq beta
Laminated source	4×10^6 Bq	4×10^6 Bq beta	2×10^8 Bq beta
Sealed source	4×10^6 Bq	4×10^6 Bq beta	2×10^8 Bq beta
Electrodeposited source (Fe-55)	2×10^8 Bq	2×10^8 Bq	2×10^9 Bq
Electrodeposited source (Ni-63)	6×10^8 Bq	6×10^8 Bq	6×10^{11} Bq
Tritium foil source	2×10^{10} Bq	2×10^{10} Bq	5×10^{12} Bq

Provisions for 'accumulation and disposal':

2×10^5 Bq (any radionuclide) per week – this is equivalent to one Class 1 source disposed per week.

Proposals:

1. Disposal of sealed sources limited to 2×10^5 Bq (any radionuclide) per 0.1 m^3 . Annual limit of 1×10^7 Bq.
2. Disposal as 'individual sealed source containing only tritium as radioactive component' of 2×10^{10} Bq per 0.1 m^3 . Annual disposal limit 1×10^{13} Bq.

Additional notes:

Exemption Order in Force 2010: Prepared compounds of uranium and thorium (1962)
Provisions for 'keeping and use': 2kg of (uranium + thorium) on the premises.
Proposals: 5kg of (natural or depleted uranium + natural thorium) on the premises.
Provisions for 'accumulation and disposal': <ol style="list-style-type: none">1. 100g of solid + liquid (uranium + thorium) disposed per day.2. 1g of gaseous (uranium + thorium) per day.
Proposals: <ol style="list-style-type: none">1. Disposal of 0.5kg of (natural or depleted uranium + natural thorium) per week.2. Gaseous disposals are exempt, provided that the gas arises from a process involving no more than the Exemption Order schedule 1, table 1 values.
Additional notes:

Exemption Order in Force 2010: Uranium and Thorium (1962)
Provisions for ‘keeping and use’: <ol style="list-style-type: none">1. No limit on holdings (solid or liquid) containing up to 4% natural thorium; for thorium in Magnesium alloy production; for thorium-impregnated incandescent mantle; or for thoria ware.2. 2kg of (uranium + thorium) on any premises.
Proposals: <ol style="list-style-type: none">1. No limit on any materials containing up to 4% thorium in alloys.2. Holdings limited to 5kg of (natural or depleted uranium + natural thorium) on any premises for all other materials.
Provisions for ‘accumulation and disposal’ <ol style="list-style-type: none">1. No limit on disposal of wastes described in ‘keeping and use’ point 1 above.2. 100g of (uranium + natural thorium) disposed from any premises per day.
Proposals: <ol style="list-style-type: none">1. No limit on disposal of any waste containing up to 4% thorium in alloys.2. Disposals limited to 0.5kg of (natural or depleted uranium + natural thorium) on any premises for all other materials.
Additional notes:

Exemption Order in Force 2010: Waste closed sources (1963)
<p>Provisions for ‘accumulation and disposal’ Waste closed sources which meet certain conditions including sending to persons authorised to dispose of radioactive waste or who produces radioactive material of the same kind as the radioactive material forming part of the closed source.</p>
<p>Proposals: Unlimited sealed sources to those who are legally entitled to receive them as long as they fulfil certain conditions. No substantial change.</p> <p>For accumulation of sealed sources, the same rules as for ‘keeping and use’ of exempt sources applies; that is, there is a limit on the accumulation prior to disposal.</p>
Additional notes:

Exemption in Force 2010: Clocks and watches (In RSA)												
<p>Provisions for ‘keeping and use’:</p> <p>Clocks and watches are unconditionally exempted where they:</p> <ol style="list-style-type: none"> 1. Contain tritium, promethium-47 or radium-226. 2. Are not on premises used for the manufacture or repair of clocks and watches. 												
<p>Proposals:</p> <ol style="list-style-type: none"> 3. Conditional exemption up to 4×10^5 Bq Ra (sealed source). 4. Conditional exemption up to 8×10^7 Pm-147 or 4×10^9 Bq tritium. 												
<p>Provisions for ‘accumulation and disposal’</p> <p>Unconditional disposal of up to 5.6×10^4 Bq Ra-226, 9.3×10^8 Bq Pm-147, 9.3×10^8 Bq tritium.</p>												
<p>Proposals:</p> <p>Conditional exemption for disposal:</p> <table border="1"> <thead> <tr> <th>Radionuclide</th> <th>Single item limit</th> <th>Annual disposal limit</th> </tr> </thead> <tbody> <tr> <td>Tritium</td> <td>4×10^9 Bq</td> <td>1×10^{11} Bq</td> </tr> <tr> <td>Pm-147</td> <td>8×10^7 Bq</td> <td>2×10^9 Bq</td> </tr> <tr> <td>Ra-226</td> <td>4×10^4 Bq</td> <td>2×10^8 Bq</td> </tr> </tbody> </table>	Radionuclide	Single item limit	Annual disposal limit	Tritium	4×10^9 Bq	1×10^{11} Bq	Pm-147	8×10^7 Bq	2×10^9 Bq	Ra-226	4×10^4 Bq	2×10^8 Bq
Radionuclide	Single item limit	Annual disposal limit										
Tritium	4×10^9 Bq	1×10^{11} Bq										
Pm-147	8×10^7 Bq	2×10^9 Bq										
Ra-226	4×10^4 Bq	2×10^8 Bq										

Additional notes:

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