ACRONYMS, ABBREVIATIONS AND GLOSSARY

Acronyms and Abbreviations

(applicable to data collected by the 1991/1992 and 1997/98 WMDB Questionnaires)

AC	After-conditioning
AFR	Away-from-reactor
AG	As-Generated
AR	At-reactor
AT	After treatment and/or conditioning
BC	Before-conditioning
Bq	Becquerel (noted as BQ in the database)
BWR	Boiling water reactor
C	Indicates a "Current" practice/process
Ci	Curie, a unit of activity equal to 3.7×10^{10} becquerels
D&D	Decontamination and decommissioning
DW	Decommissioning waste
FBR	Fast breeder reactor
GCR	Gas cooled reactor
HLW	High level waste
HTGR	High temperature gas cooled reactor
l	Litre (indicated as "L" in the database)
L/ILW	Low- and intermediate-level waste
LWGR	Light water cooled, graphite moderated reactor
LWR	Light water reactor
MW(e)	Megawatt electric
m	Meter (noted as M in database)
m^3	Cubic meter (noted as CM in database)
mt	Metric tonne (noted as MT in database)
mtU	Metric tonne Uranium (noted as MTU in database)
N/A	Not applicable
NPP	Nuclear power plant
P	Indicates a "Planned" practice/process
PWR	Pressurized water reactor
R	Under "research & development"
R&D	Research and Development
S	"Selected"
SF	Spent nuclear fuel
SGHWR	Steam generating heavy water reactor
SRS	Spent, sealed radiation source(s)
TBD	To be determined
TRU waste	Alpha bearing waste or transuranic waste
U	"Under investigation"
UMMT	Uranium mine and mill tailings
WWER	Russian design PWR

Glossary

The terms used in this report are commonly used by the nuclear industry, however, some definitions are provided for clarification. Much of the following is based upon a draft safety glossary that was under development at the IAEA at the time of writing of the Radioactive Waste Management Profiles No. 3. Terms in square braces, [ ], are outdated and should not be used. Glossary references are provided at the end of the glossary.

ACTIVITY

The quantity A for an amount of radionuclide in a given energy state at a given time, defined as:

$$A(t) = \frac{dN}{dt}$$

where dN is the expectation value of the number of spontaneous nuclear transformations from the given energy state in the time interval dt. [1]

The rate at which nuclear transformations occur in a radioactive material. The equation is sometimes given as $A(t) = -\frac{dN}{dt}$, where N is the number of nuclei of the radionuclide, and hence the rate of change of N with time is negative. Numerically, the two forms are identical.

The SI unit of activity is the reciprocal second (s^{-1}), termed the becquerel (Bq). [1]

Formerly expressed in curie (Ci); activity values may be given in Ci (with the equivalent in Bq in parentheses) if they are being quoted from a reference which uses that unit.

specific activity: Of a radionuclide, the activity per unit mass of that nuclide. Of a material, the activity per unit mass or volume of the material in which the radionuclides are essentially uniformly distributed. [2]

The distinction in usage between specific activity and **activity concentration** is controversial. Some regard the terms as synonymous, and may favour one or the other (as above). ISO 921 [11] distinguishes between specific activity as the activity per unit mass and activity concentration as the activity per unit volume. Another common distinction is that specific activity is used (usually as activity per unit mass) with reference to a pure sample of a radionuclide or, less strictly, to cases where a radionuclide is intrinsically present in the material (e.g. carbon-14 in organic materials, uranium-235 in natural uranium), even if the abundance of the radionuclide is artificially changed. In this usage, activity concentration (which may be activity per unit mass or per unit volume) is used for any other situation, i.e. when the activity is in the form of contamination in or on a material.

In general, the term activity concentration is more widely applicable, is more self-evident in meaning, and is less likely than specific activity to be confused with unrelated terms (such as 'specified activities'). Activity concentration is therefore preferred to specific activity for general use in safety related IAEA publications.

ALPHA (TRU) WASTE

Per the IAEA's proposed **waste class definitions** (click on the red, underlined text to view these definitions), alpha waste can be considered as a component of LILW-LL. However, these definitions were developed after the initial implementation of the WMDB, in which alpha bearing wastes were identified as a distinct waste class. In addition, historically, alpha waste has been reported by one major Member State as transuranic (TRU) waste, per the following WMDB Profile report:

International Atomic Energy Agency
Alpha Bearing Waste

United States of America	Date Printed: 2000-01-14	Ref. Yr.: 1997/98	298

Responsible Organisation

Name: please refer to the Laws and Policies Section
Division:
Address:
Director:
Title:

Laws and Policies

The following was received from the USDOE
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In the U.S., the TRUW class designation is used in the DOE waste management program. It is defined as non-high level radioactive waste contaminated with alpha-emitting transuranic radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries (3,700 becquerels) per gram of waste.

The 1997/98 WMDB Questionnaire continued to ask Member States to report alpha (TRU) wastes as a distinct class. Some Member States completed the alpha (TRU) subsection of the WMDB while other Member States simply reported that alpha (TRU) waste was managed as either a component of overall LILW or as a component of LILW-LL.

The whole issue of waste class definitions, especially differences between the Agency's proposed classification scheme and the schemes used by Member States, was under review at the time this glossary was compiled for the Radioactive Waste Management Profiles No 3 (early 2000).

BACKFILL

Material used to refill excavated portions of a repository after waste has been emplaced.

BARRIER

A physical obstruction that prevents or inhibits the movement of people, radionuclides or some other phenomenon (e.g. fire), or provides shielding against radiation.

intrusion barrier: Components of a repository designed to prevent inadvertent access to the waste by humans, animals or plants.

multiple barriers: Two or more natural or engineered barriers used to isolate radioactive waste in, and prevent migration of radionuclides from, a repository.

BECQUEREL (BQ)

Name for the SI unit of activity, equal to one transformation per second. Supersedes the curie (Ci). 1 Bq = 27 pCi ($2.7\ 10^{-11}$ Ci) approximately

BIOSPHERE

That part of the environment normally inhabited by living organisms.

In practice, the biosphere is not usually defined with great precision, but is generally taken to include the atmosphere and the Earth's surface, including the soil, surface water bodies, seas and oceans and their sediments. There is no generally accepted definition of the depth below the surface at which soil or sediment ceases to be part of the biosphere, but this might typically be taken to be the depth affected by basic human actions, particularly farming.

In waste safety in particular, the biosphere is normally distinguished from the geosphere.

BITUMEN

The term bitumen refers to a wide range of hydrocarbons with high molecular weight, commercially available as a residue of petroleum or coal tar refining. There are two major components -- asphaltene compounds, which give bitumen colloidal properties, and malthene compounds, which impart viscous liquid properties. Bitumen is used by some Member States as a matrix for the immobilization of LILW.

BSS

Basic Safety Standards (see reference [1])

BUFFER

Any substance placed around a waste package in a repository to serve as an additional barrier to stabilize the surrounding environment, restrict the access of groundwater to the waste package, and reduce by sorption the rate of eventual radionuclide migration from the waste.

The above definition is specific to waste safety. The term buffer (e.g. in buffer solution) is also used, in its normal scientific sense (and therefore normally without specific definition), in a variety of contexts.

CALCINATION

A process involving the evaporation of a waste solution to sufficient dryness and the heating of the residue in air so as to produce oxides of the metallic constituents.

CANISTER, WASTE

See container, waste

CEMENT

Various substances used for bonding or setting to a hard material. Portland cement, the most common, is a mixture of calcium silicates and aluminates made by heating limestones with clay containing aluminosilicate in a kiln. Cement is a main ingredient in final products referred to as: concrete if it contains aggregates (usually small stones); or without aggregates, a grout.

CHARACTERIZATION

Determination of the nature and activity of radionuclides present in a specified place. For example, determination of the radionuclides present in a bioassay sample or in an area contaminated with radioactive material (as a first step in planning cleanup). For the latter example, care should be taken to avoid confusion with the existing, and different, definition of the term site characterization.

> site characterization: Detailed surface and subsurface investigations and activities at candidate disposal sites to obtain information to determine the suitability of the site for a repository and to evaluate the long term performance of a repository at the site. Site characterization is a stage in the siting of a repository; it follows area survey and precedes site confirmation.
>
> waste characterization: Determination of the physical, chemical and radiological properties of the waste to establish the need for further adjustment, treatment, conditioning, or its suitability for further handling, processing, storage or disposal.

CLEANUP

Any measures that may be carried out to reduce the radiation exposure from existing contamination through actions applied to the contamination itself (the source) or to the exposure pathways to humans.

The terms rehabilitation**,** remediation and restoration are sometimes used, with essentially the same meaning.

CLEARANCE

Removal of radioactive materials or radioactive objects within authorized practices from any further regulatory control by the regulatory body.

Removal from regulatory control in this context refers only to control applied for reasons related to the radiological hazard.

The term clearance refers only to cases where materials from practices are released from regulatory control on the basis that the exposures (including potential exposures) resulting from any further use or disposal of the materials are too low to warrant further control. Control may also be removed through the authorization process, on the basis of optimization (e.g. in the case of authorized discharges to the environment), but this is not clearance.

Conceptually, clearance, removing certain materials or objects within authorized practices from further control, is closely linked to exemption, determining that controls do not need to be applied to certain sources and practices.

Various terms are used in different States to describe this concept, e.g. ‘free release’.

CLEARANCE LEVEL

See level

CLOSEOUT

Administrative and technical actions directed at a mill tailings impoundment, or other deposit of waste from mining and milling, to achieve safe long term conditions such that little or no future surveillance or maintenance is likely to be required.

For a repository, the term closure is used. For all other facilities, the term decommissioning is used in Agency terminology. However, some States use closeout for other types of facility and activity, such as medical and industrial applications.

CLOSURE

Administrative and technical actions directed at a repository at the end of its operating lifetime, for example, covering of the disposed waste (for a near surface repository) or backfilling and/or sealing (for a geological repository and the passages leading to it) and termination and completion of activities in any associated structures.

For a mill tailings impoundment or other deposit of waste from mining and milling, the term closeout is used. For all other facilities, the term decommissioning is used.

The terms siting, design, construction, commissioning, operation and decommissioning are normally used to delineate the six major stages of the life of an authorized facility and of the associated licensing process. In the special cases of mining and milling facilities and waste disposal facilities, decommissioning is replaced in this sequence by closeout and closure respectively.

COMMISSIONING

The process during which components and systems of facilities and activities, having been constructed, are made operational and verified to be in accordance with design specifications and to have met relevant performance criteria.

Commissioning may include both non-nuclear/non-radioactive and nuclear/radioactive testing.

COMPACTION

A treatment method where the bulk volume of a compressible material is reduced by application of external pressure -- hence an increase in its density (mass per unit volume)

Compaction of soil materials covering a near surface disposal facility to reduce its permeability.

CONDITIONING

See waste management, radioactive

CONFINEMENT

A barrier which surrounds the main parts of a facility containing radioactive materials and which is designed to prevent or mitigate the uncontrolled release of radioactive material to the environment in operational states or design basis accidents.

Confinement is similar in meaning to containment, but confinement is typically used to refer to the barriers immediately surrounding the radioactive material, whereas containment refers to the additional layers of defence intended to prevent the radioactive materials reaching the environment if the confinement is breached. Hence, for example, in a nuclear power plant confinement may be provided by the reactor pressure vessel, whereas containment may be provided by the building housing the reactor. In a repository, confinement may be provided by the waste form and its container, whereas containment may be provided by the surrounding host rock.

This is not the meaning of confinement implied in use of the term confinement system in the Transport Regulations. [2]

CONTAINER, WASTE

The vessel into which the waste form is placed for handling, transport, storage and/or eventual disposal; also the outer barrier protecting the waste from external intrusions.

The waste container is a component of the waste package. For example, molten HLW glass would be poured into a specially designed container (canister) where it would cool and solidify.

Note that the term waste canister is often considered to be a specific term for a container for spent fuel or vitrified high level waste.

CONTAINMENT

Methods or physical structures designed to prevent the dispersion of radioactive substances.

Although approximately synonymous with confinement, containment is normally used to refer to methods or structures that prevent radioactive substances being dispersed in the environment if confinement fails. See confinement for a more extensive discussion.

CONTAMINATION

(scientific definition): Radioactive substances on surfaces, or within solids, liquids or gases (including the human body), where their presence is unintended or undesirable, or the process giving rise to their presence in such places.

Also used less formally to refer to a quantity, namely the activity present on a surface (or on unit area of a surface).

Translation of the term contamination into some other languages may introduce a connotation that is not present in English. The English language term contamination refers only to the presence of activity, and gives no indication of the magnitude of the hazard involved.

(regulatory definition): The presence of a radioactive substance on a surface in quantities in excess of 0.4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 0.04 Bq/cm^2 for all other alpha emitters. [2]

This is a regulatory definition of contamination, specific to the Transport Regulations. Levels below 0.4 Bq/cm^2 or 0.04 Bq/cm^2 would be considered contamination according to the scientific.

fixed contamination**:** Contamination other than non-fixed contamination. [2]

non-fixed contamination**:** Contamination that can be removed from a surface during routine conditions of transport. [2]

CONTROL

The function or power of directing or regulating. It should be noted that the usual meaning of the English word control in safety related contexts is somewhat 'stronger' (more active) than that of similar words in some other languages. For example, 'control' typically implies not only checking or monitoring something, but also making sure that corrective or enforcement measures are taken if the results of the checking or monitoring indicate an unsatisfactory situation.

institutional control: Control of a waste site by an authority or institution designated under the laws of a country. This control may be active (monitoring, surveillance, remedial work) or passive (land use control) and may be a factor in the design of a nuclear facility (e.g. near surface repository).

Most commonly used to describe controls over a repository after closure or a facility undergoing decommissioning.

The term institutional control is more general than regulatory control (i.e. regulatory control may be thought of as a special form of institutional control). In particular, institutional control measures may be passive, they may be imposed for reasons not related to protection or safety (although they may nevertheless have some impact on protection and safety), they may be applied by organizations that do not meet the definition of a regulatory body, and they may apply in situations which do not fall within the scope of facilities and activities. As a result, some form of institutional control may be considered more likely to endure further into the future than regulatory control.

regulatory control: Any form of control applied to facilities or activities by a regulatory body for reasons related to protection or safety.

[curie (Ci)]

Unit of activity, equal to 3.7×10^{10} Bq (exactly).

Superseded by the becquerel (Bq). Activity values may be given in Ci (with the equivalent in Bq in parentheses) if they are being quoted from a reference which uses that unit.
Originally, the activity of a gram of radium. Occasionally still referred to as 'gram equivalent radium'.

[DE MINIMIS]

A general term used historically to describe concepts that would now be referred to by terms such as exemption or clearance. The term is also sometimes used to describe a related (and controversial) philosophy that assessments of collective dose should exclude that portion delivered at very low individual dose rates.

The term de minimis is still used in some specific contexts, such as the London Convention 1972 [14].

The appropriate terminology of exemption, clearance, etc. should be used in Agency publications.

DECOMMISSIONING

Administrative and technical actions taken to allow the removal of some or all of the regulatory controls from a facility other than a repository or a deposit of waste from mining and milling.

The use of the term decommissioning implies that no further use of the facility (or part thereof) for its existing purpose is foreseen.

The actions will need to be such as to ensure the long term protection of the public and the environment, and typically include reducing the levels of residual radionuclides in the materials and the site of the facility so that the materials can be safely recycled, reused or disposed of as exempt waste or as radioactive waste, and the site can be released for unrestricted use or otherwise reused.

Decommissioning typically includes dismantling the facility (or part thereof), but in the Agency's usage this need not be the case. It could, for example, be decommissioned without dismantling and the existing structures subsequently put to another use (after decontamination).

For a repository, the corresponding term is closure. For a deposit of waste from mining and milling, the corresponding term is closeout.

DECOMMISSIONING PLAN

A document containing detailed information on the proposed decommissioning of a facility.

DECONTAMINATION

The complete or partial removal of contamination by a deliberate physical, chemical or biological process.

This definition is intended to include a wide range of processes, but to exclude the removal of radionuclides from the human body by natural biological processes, which is not considered to be decontamination.

DEEP SEA DISPOSAL

See disposal

DECOMMISSIONING STAGES

This term has been previously used in IAEA documents. It referred to three discrete stages of decommissioning (storage with surveillance, restrict release and unrestricted release). As a result of decommissioning experience, an increasing number of Member States now use different terminologies and approaches.

Stage-1 The first containment barrier is kept as it was during operation. But mechanical openings are permanently sealed. The containment building and atmosphere are kept in a state appropriate to the hazard in the building. Surveillance, monitoring, and inspections are carried out to ensure the plant remains in good condition.

Stage-2 The first contamination barrier is reduced to minimum size by removing easily dismantled parts. Sealing of the barrier is reinforced by physical means and the biological shield is extended, if necessary, to completely surround the barrier. After decontamination, the containment building may be modified or removed if it is no longer required for radiological safety. Access to the building can be permitted. The non-radioactive buildings on site can be used for other purposes. Surveillance and inspection can be relaxed but spot checks should continue.

Stage-3 All materials, equipment, and parts of the plant still containing significant radioactivity are removed. The plant and site are released for unrestricted use. No further inspection or monitoring is required.

DISPOSAL

The emplacement of waste in an approved, specified facility without the intention of retrieval.

Some States use the term disposal to include discharges of effluents to the environment.

In many cases, the only element of this definition that is important is the distinction between disposal (with no intent to retrieve) and storage (with intent to retrieve). In such cases, a definition is not necessary; the distinction can be made in the form of a footnote at the first use of the term disposal or storage (e.g. “The use of the term disposal indicates that there is no intention to retrieve the waste. If retrieval of the waste at any time in the future is intended, the term storage is used.”).

In some States, the term disposal is used administratively in such a way as to include, for example, incineration of waste or the transfer of waste between operators. In Agency publications, disposal should only be used in accordance with the more restrictive definition given above.

The term disposal implies that retrieval is not intended; it does not mean that retrieval is not possible.

Contrasted with storage.

direct disposal: Disposal of spent fuel as waste.

geological disposal: Disposal in a geological repository.

near surface disposal: Disposal, with or without engineered barriers, in a near surface repository.

sub-seabed disposal: Disposal in a geological repository in the rock underlying the ocean floor.

The terms deep sea disposal and seabed disposal do not strictly satisfy the above definition (since retrieval is not possible), but they are consistent with the everyday meaning of disposal and are used as such.

deep sea disposal: Disposal of waste packaged in containers on the deep ocean floor as practised until 1982 in accordance with the requirements of the London Convention 1972 [14]. The commonly used, but informal, term ‘sea dumping’ should not be used in Agency publications.

seabed disposal: Emplacement of waste packaged in suitable containers at some depth into the sedimentary layers of the deep ocean floor. This may be achieved by direct emplacement, or by placing the waste in specially designed ‘penetrators’ which, when dropped into the sea, embed themselves in the sediment.

DISPOSAL FACILITY

Synonymous with repository

EVAPORATION

Concentration of a liquid by conversion of some fraction of the volatile material content to the vapour state by latent heat. Evaporation, a treatment method, is used to concentrate some types of radioactive solutions.

EVENT

In the context of the reporting and analysis of events, an event is any unintended occurrence, including operating error, equipment failure or other mishap, the consequences or potential consequences of which are not negligible from the point of view of protection or safety.

The above is not the intended definition for Member State reporting in the WMDB field entitled “Significant Events and Milestones”. Instead, the purpose of the “Significant Events

and Milestones" field was to report noteworthy happenings, such as the obtaining of a disposal facility license, that have occurred in Member States.

EXEMPT WASTE

See waste

EXEMPTION

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 (including potential exposure) due to the source or practice is too small to warrant the application of those aspects.

Some references (e.g. ICRP 60 [16]) extend the scope of exemption to include any sources and practices for which exemption is the optimum protection option, i.e. where the reduction in doses or risks that could be achieved through regulatory control are disproportionately small in relation to the costs associated with such regulatory control (irrespective of the actual level of the doses or risks). The preferred Agency usage is restricted to the cases where the doses and risks are very low.

See also clearance

EXEMPTION LEVEL

See level

FACILITIES AND ACTIVITIES

A general term encompassing nuclear facilities, uses of all sources of ionizing radiation, all radioactive waste management activities, transport of radioactive material and any other practice or circumstances where people may be exposed to radiation from naturally occurring or artificial sources.

Facilities include nuclear facilities, irradiation installations, mining and milling facilities, waste management facilities and any other place where radioactive materials are produced, processed, used, handled, stored or disposed of — or where radiation generators are installed — on such a scale that consideration of protection and safety is required. Activities include the production, use, import and export of radiation sources for industrial, research and medical purposes, the transport of radioactive material, the mining and processing of radioactive ores and closeout of associated facilities, cleanup of sites affected by residues from past activities and radioactive waste management activities such as the discharge of effluents.

This term is intended to provide an alternative to the terminology of sources and practices (or intervention) to refer to general categories of situations. For example, a practice may involve many different facilities and/or activities, whereas the general definition of source is too broad in some cases: a facility or activity might constitute a source, or might involve the use of many sources, depending upon the interpretation used.

The term facilities and activities is very general, and includes those for which no or little regulatory control may be necessary or achievable: the more specific terms authorized facility

and authorized activity should be used to distinguish those facilities and activities for which any form of authorization has been given.

FACILITY

See facilities and activities

FUEL ASSEMBLY

A set of fuel elements and associated components which are loaded into and subsequently removed from a reactor core as a single unit.

FUEL CYCLE

See nuclear fuel cycle

FUEL ELEMENT

A rod of nuclear fuel, its cladding and any associated components necessary to form a structural entity.

GEOLOGICAL DISPOSAL

See disposal

GEOLOGICAL REPOSITORY

See repository

GEOSPHERE

Those parts of the lithosphere not considered to be part of the biosphere.

In waste safety, usually used to distinguish the subsoil and rock (below the depth affected by normal human activities, particularly agriculture) from the soil that is part of the biosphere.

HALF-LIFE, $T_{½}$

For a radionuclide, the time required for the activity to decrease, by a radioactive decay process, by half.

Where it is necessary to distinguish this from other half-lives (see below), the term radioactive half-life should be used.

The half-life is related to the decay constant, λ, by the expression:

$$T_{½} = \frac{\ln 2}{\lambda}$$

The time taken for the quantity of a specified material (e.g. a radionuclide) in a specified place to decrease by half as a result of any specified process or processes that follow similar exponential patterns to radioactive decay.

biological half-life***:*** The time taken for the quantity of a material in a specified tissue, organ or region of the body (or any other specified biota) to halve as a result of biological processes.

effective half-life***, T_{eff}:*** The time taken for the activity of a radionuclide in a specified place to halve as a result of all relevant processes.

$$T_{eff} = \frac{\prod_i T_i}{\sum_i T_i} \quad (\text{or } \frac{1}{T_{eff}} = \sum_i \frac{1}{T_i})$$

where T_i is the half-life for process *i*.

radioactive half-life: For a radionuclide, the time required for the activity to decrease, by a radioactive decay process, by half. The term 'physical half-life' is also used for this concept.

[HEAT GENERATING WASTE (HGW)]

See waste classes

IMMOBILIZATION

See waste management, radioactive

INCINERATION

A waste treatment process of burning combustible waste to reduce its volume and yield an ash residue.

[INTERIM STORAGE]

See storage

[INTERMEDIATE LEVEL WASTE (ILW)]

See waste classes

INTRUSION BARRIER

See barrier

ION EXCHANGE

A usually reversible exchange of one ion with another, either on a solid surface, or within a lattice. A commonly used method for treatment of liquid waste.

LEVEL

action level: The level of dose rate or activity concentration above which remedial actions or protective actions should be carried out in chronic exposure or emergency exposure situations. [1]

emergency action level (EAL): A predetermined, site specific, observable criterion which determines the emergency class of an event, and hence whether protective actions are implemented.

- An EAL could represent an instrument reading, the status of a piece of equipment or any observable event, such as a fire. In this sense, it is not strictly an action level as defined above, but has essentially the same function.

clearance level: A value, established by a regulatory body and expressed in terms of activity concentration and/or total activity, at or below which a source of radiation may be released from regulatory control.

See also clearance.

exemption level: A value, established by a regulatory body and expressed in terms of activity concentration and/or total activity, at or below which a source of radiation may be granted exemption from regulatory control without further consideration.

In the BSS [1], the term exemption levels is used, and values are specified in Table I-1 of Schedule I, but neither exemption nor exemption level is defined in the BSS glossary.

intervention level: The level of avertable dose at which a specific protective action or remedial action is taken in an emergency exposure situation or a chronic exposure situation. [1]

operational intervention level (OIL): A level, specified in terms of a measurable quantity, which is related to intervention levels of avertable dose.

- OILs are typically expressed in terms of dose rates or of activity concentrations of radionuclides in environmental, food or water samples. In this sense, they are not strictly intervention levels as defined above, but have essentially the same function.

investigation level: The value of a quantity such as effective dose, intake, or contamination per unit area or volume at or above which an investigation should be conducted. [1]

recording level: A level of dose, exposure or intake specified by the Regulatory Authority at or above which values of dose, exposure or intake received by workers are to be entered in their individual exposure records. [1]

reference level: An action level, intervention level, investigation level or recording level. [1]

LICENCE

An authorization granted by a regulatory body on the basis of a safety assessment and accompanied by specific requirements and conditions to be complied with by the licensee.

The holder of a current licence is termed a licensee. Other derivative terms should not be needed; a licence is a product of the authorization process (although the term licensing process is sometimes used), and a practice with a current licence is an authorized practice.

Authorization may take other forms, such as registration.

LICENSEE

See licence

LICENSING PROCESS

See licence

LIMIT

The value of a quantity used in certain specified activities or circumstances that must not be exceeded. [1]

The term limit should only be used for a criterion that must not be exceeded, e.g. where exceeding the limit would cause some form of legal sanction to be invoked. Criteria used for other purposes — e.g. to indicate a need for closer investigation or a review of procedures, or as a threshold for reporting to a regulatory body — should be described using other terms, such as reference level.

acceptable limit: A limit acceptable to the regulatory body.

The term acceptable limit is usually used to refer to a limit on the predicted radiological consequences of an accident (or on potential exposures if they occur) that is acceptable to the relevant regulatory body when the probability of occurrence of the accident or potential exposures has been taken into account (i.e. on the basis that it is unlikely to occur). The term authorized limit should be used to refer to limits on doses or risks, or on releases of radionuclides, which are acceptable to the regulatory body on the assumption that they are likely to occur.

See ICRP [25].

authorized limit: A limit on a measurable quantity, established or formally accepted by a regulatory body.

Equivalent in meaning to prescribed limit, authorized limit has been more commonly used in radiation and waste safety, particularly in the context of limits on discharges.

Wherever possible, authorized limit should be used in preference to prescribed limit.

derived limit: A limit on a measurable quantity set, on the basis of a model, such that compliance with the derived limit may be assumed to ensure compliance with a primary limit.

dose limit: The value of the effective dose or the equivalent dose to individuals from controlled practices that shall not be exceeded. [1]

operational limits and conditions: A set of rules setting forth parameter limits, the functional capability and the performance levels of equipment and personnel approved by the regulatory body for safe operation of an authorized facility.

[prescribed limit]**:** A limit established or accepted by the regulatory body. The term authorized limit is preferred.

primary limit: A limit on the dose or risk to an individual.

safety limits: Limits on operational parameters within which an authorized facility has been shown to be safe.

Safety limits represent conditions which are beyond operational limits and conditions, but which have nevertheless been shown to be safe; the difference between the two is the safety margin.

[secondary limit]: A limit on a measurable quantity, which corresponds to a primary limit.

e.g. the annual limit on intake, a secondary limit, corresponds to the primary limit on annual effective dose for a worker.

Such a limit meets the definition of derived limit, and therefore derived limit should be used.

LINER

(a) A layer of material placed between a waste form and a container to resist corrosion or any other degradation of a waste package

(b) A layer of clay, plaster, asphalt or other impermeable material placed around or beneath a tailings impoundment to prevent leakage and/or erosion.

LONG LIVED WASTE

See waste classes

LOW AND INTERMEDIATE LEVEL WASTE (LILW)

See waste classes

[LOW LEVEL WASTE (LLW)]

See waste classes

[MEDIUM LEVEL WASTE (MLW)]

See waste classes

MILL TAILINGS

The residues resulting from processing ore to extract uranium series or thorium series radionuclides, or similar residues from processing ores for other purposes.

MINE OR MILL PROCESSING RADIOACTIVE ORES

Installation for mining, milling or processing ores containing uranium series or thorium series radionuclides. A mine processing radioactive ores is any mine that yields ores containing uranium series or thorium series radionuclides, either in sufficient quantities or concentrations to warrant exploitation or, when present in conjunction with other substances being mined, in quantities or concentrations that require radiation protection measures to be taken as determined by the Regulatory Authority. A mill processing radioactive ores is any facility for processing radioactive ores from mines as here defined to produce a physical or chemical concentrate. [1]

MINIMIZATION, WASTE

The process of reducing the amount and activity of radioactive waste to a level as low as reasonably achievable, at all stages from the design of a facility or activity to decommissioning, by reducing waste generation and by means such as recycling and reuse, and treatment, with due consideration for secondary as well as primary waste. Should not be confused with volume reduction.

MINING AND MILLING

Mining in a mine that yields ore containing uranium series or thorium series radionuclides either in sufficient amounts or concentrations to warrant exploitation or, when present in conjunction with other substances being mined, in amounts or concentrations that require radiation protection measures to be taken; and processing of radioactive ores from such mines to produce a chemical concentrate.

This definition includes those mining and milling operations aimed at extracting uranium series or thorium series radionuclides and those aimed at extracting other substances from ores which represent a significant radiological hazard.

MIXED WASTE

See waste

MONITORING

The measurement of dose or contamination for reasons related to the assessment or control of exposure to radiation or radioactive substances, and the interpretation of the results. [1]

Measurement is used somewhat loosely here. The 'measurement' of dose often means the measurement of a dose equivalent quantity as a proxy for a dose quantity that cannot be measured directly. Also, sampling may be involved as a preliminary step to measurement.

Monitoring may be subdivided in two different ways: according to where the measurements are made, into individual monitoring, workplace monitoring, source monitoring and environmental monitoring; and, according to the purpose of the monitoring, into routine monitoring, task related monitoring and special monitoring.

area monitoring: A form of workplace monitoring in which an area is monitored by taking measurements at different points in the area. As opposed to measurements by a static monitor.

environmental monitoring: The measurement of external dose rates due to sources in the environment or of radionuclide concentrations in environmental media. Contrasted with source monitoring.

individual monitoring: Monitoring using measurements by equipment worn by individual workers, or measurements of quantities of radioactive materials in or on their bodies. Also called personal monitoring. Usually contrasted with workplace monitoring.

personal monitoring: Synonymous with individual monitoring.

personnel monitoring: The overall effect of a combination of individual monitoring and workplace monitoring.

routine monitoring: Monitoring associated with continuing operations and intended: (1) to demonstrate that working conditions, including the levels of individual dose, remain satisfactory; and (2) to meet regulatory requirements. Routine monitoring can be individual monitoring or workplace monitoring. Contrasting terms: task related monitoring and special monitoring.

source monitoring: The measurement of activity in radioactive materials being released into the environment or of external dose rates due to sources within a facility or activity. Contrasted with environmental monitoring.

special monitoring: Monitoring designed to investigate a specific situation in the workplace for which insufficient information is available to demonstrate adequate control, by providing detailed information to elucidate any problems and to define future procedures. Special monitoring would normally be undertaken at the commissioning stage of new facilities, following major modifications either to facilities or procedures, or when operations are being carried out under abnormal circumstances, such as an accident. Special monitoring can be individual monitoring or workplace monitoring. Contrasting terms: routine monitoring and task related monitoring.

task related monitoring: Monitoring related to a specific operation, to provide data to support the immediate decisions on the management of the operation. Task related

monitoring can be individual monitoring or workplace monitoring. Contrasting terms: routine monitoring and special monitoring.

workplace monitoring: Monitoring using measurements made in the working environment. Usually contrasted with individual monitoring.

Continuous or periodic measurement of radiological or other parameters or determination of the status of a system. Sampling may be involved as a preliminary step to measurement.

Although the concept is not fundamentally different from the one above, this definition is more suited to the types of monitoring concerned primarily with safety (i.e. keeping sources under control) rather than with protection (i.e. controlling exposure). This definition is particularly relevant to monitoring of the status of a nuclear installation by tracking plant variables, or monitoring the long term performance of a waste repository by tracking variables such as water fluxes. These examples differ from the definition above in that the routine measurements are themselves of no particular interest; the monitoring is only to detect unexpected deviations if they occur.

condition monitoring: Observation, measurement or trending of condition indicators with respect to some independent parameter (usually time or cycles) to indicate the current and future ability of a system, structure or component to function within acceptance criteria.

MULTIPLE BARRIERS

See barrier

NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM)

Material containing no significant amounts of radionuclides other than naturally occurring radionuclides. The exact definition of ‘significant amounts’ would be a regulatory decision.

This includes materials in which the activity concentrations of these naturally occurring radionuclides have been changed by mane-made processes (often referred to as technologically enhanced NORM or TE NORM).

NATURALLY OCCURRING RADIONUCLIDES

Radionuclides that occur naturally in significant quantities on Earth.

The term is usually used to refer to the primordial radionuclides potassium-40, uranium-235, uranium-238 and thorium-232 (the decay product of primordial uranium-236) and their radioactive decay products, but could also include tritium and carbon-14, low concentrations of which are generated by natural activation processes.

NEAR SURFACE DISPOSAL

See disposal

NEAR SURFACE REPOSITORY

See repository

NORM WASTE

See waste classes

NUCLEAR FACILITY

A facility and its associated land, buildings and equipment in which radioactive materials are produced, processed, used, handled, stored or disposed of on such a scale that consideration of safety is required. Essentially synonymous with authorized facility, and hence more general than nuclear installation.

NUCLEAR FUEL CYCLE

All operations associated with the production of nuclear energy, including:

- mining and milling, processing and enrichment of uranium or thorium;
- manufacture of nuclear fuel;
- operation of nuclear reactors (including research reactors);
- reprocessing of nuclear fuel;
- any related research and development activities; and
- all related waste management activities (including decommissioning).

NUCLEAR INSTALLATION

A nuclear fuel fabrication plant, nuclear reactor (including subcritical and critical assemblies), research reactor, nuclear power plant, spent fuel storage facility, enrichment plant or reprocessing facility. [1] This is essentially any authorized facility that is part of the nuclear fuel cycle except radioactive waste management facilities.

NUCLEAR MATERIAL

Plutonium except that with isotopic concentration exceeding 80% in plutonium-238; uranium-233; uranium enriched in the isotope 235 or 233; uranium containing the mixture of isotopes as occurring in nature other than in the form of ore or ore-residue; any material containing one or more of the foregoing. [26]

The Statute of the IAEA [27] uses the term special fissionable material, with essentially the same meaning, but explicitly excluding source material.

NUCLEAR SAFETY

The achievement of proper operating conditions, prevention of accidents or mitigation of accident consequences, resulting in protection of site personnel, the public and the environment from undue radiation hazards.

OPERATING ORGANIZATION

The organization authorized by the regulatory body to operate a facility. Note that it may be the operating organization before operation starts. In practice, for an authorized facility, the operating organization is normally also the licensee or registrant. However, the separate terms are retained to refer to the two different capacities.

The organization (and its contractors) which undertakes the siting, design, construction, commissioning and/or operation of a nuclear facility. This usage is peculiar to waste safety documentation, with the corresponding understanding of siting as a multistage process. This difference is partly a reflection of the particularly crucial role of siting in the safety of repositories.

OPERATOR

Any organization or person applying for authorization or authorized and/or responsible for nuclear, radiation, waste or transport safety when undertaking activities or in relation to any nuclear facilities or sources of ionizing radiation. This includes, among others, private individuals, governmental bodies, consignors or carriers, licensees, hospitals, self-employed persons, etc. Synonymous with operating organization. Operator is sometimes used to refer to operating personnel. If used in this way, particular care should be taken to ensure that there is no possibility of confusion.

OVERPACK

See waste management, radioactive

PACKAGE, WASTE

The product of conditioning that includes the waste form and any container(s) and internal barriers (e.g. absorbing materials and liner), as prepared in accordance with requirements for handling, transport, storage and/or disposal.

PACKAGING

See waste management, radioactive

PRACTICE

Any human activity that introduces additional sources of exposure or exposure pathways or extends exposure to additional people or modifies the network of exposure pathways from existing sources, so as to increase the exposure or the likelihood of exposure of people or the number of people exposed. [1]

Radioactive waste management activities are normally considered to be part of the practice that gave rise to the waste, and do not constitute a separate practice.

Contrasting term: intervention. See also facilities and activities.

Terms such as 'authorized practice', 'controlled practice' and 'regulated practice' are used to distinguish those practices that are subject to regulatory control from other activities which meet the definition of practice but do not need or are not amenable to control.

PREDISPOSAL

See waste management, radioactive

PRETREATMENT

See waste management, radioactive

PROCESSING, WASTE

See waste management, radioactive

PROTECTION AND SAFETY

The protection of people against exposure to ionizing radiation or radioactive materials and the safety of radiation sources, including the means for achieving this, and the means for preventing accidents and for mitigating the consequences of accidents should they occur. [1]

Safety is primarily concerned with maintaining control over sources, whereas (radiation) protection is primarily concerned with controlling exposure to radiation and its effects. Clearly the two are closely connected: radiation protection is very much simpler if the source in question is under control, so safety necessarily contributes towards protection. Sources come in many different types, and hence safety may be termed nuclear safety, radiation safety, radioactive waste safety or transport safety, but protection (in this sense) is primarily concerned with protecting humans against exposure, whatever the source, and so is always radiation protection.

RADIATION

When used in Agency publications, the term radiation normally refers only to ionizing radiation. The IAEA has no statutory responsibilities in relation to non-ionizing radiation. For

the purposes of radiation protection, radiation capable of producing ion pairs in biological material(s). [1]

strongly penetrating radiation**:** Radiation for which limits on effective dose are normally more restrictive than limits on equivalent dose to any tissue or organ, i.e. the fraction of the relevant dose limit received will, for a given exposure, be greater for effective dose than for equivalent dose to any tissue or organ. If the reverse is true, the radiation is termed weakly penetrating radiation. For most practical purposes, it may be assumed that strongly penetrating radiation includes photons of energy above about 20–30 keV, high energy electrons (more than about 1–2 MeV) and neutrons, and that weakly penetrating radiation includes photons of energy below about 20–30 keV, beta particles and other electrons of less than about 1–2 MeV, and massive charged particles such as protons. Contrasting term: weakly penetrating radiation.

weakly penetrating radiation**:** See strongly penetrating radiation.

RADIOACTIVE *(*adjective*)*

(scientific definition) Exhibiting radioactivity.

(regulatory definition) Designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity.

RADIOACTIVE CONTENTS

The radioactive material together with any contaminated or activated solids, liquids, and gases within the packaging. [2]

RADIOACTIVE MATERIAL

Material designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity.

Some States use the term radioactive substance for this regulatory purpose. However, the term radioactive substance is also sometimes used to indicate that the scientific use of radioactive is intended, rather than the regulatory meaning of radioactive (see below) suggested by the term radioactive material. It is therefore essential that any such distinctions in meaning are clarified.

Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in [2, paragraphs 401–406].

RADIOACTIVE SUBSTANCE

See radioactive material

RADIOACTIVE WASTE

See waste, radioactive

RADIOACTIVE WASTE MANAGEMENT

See waste management, radioactive

RADIOACTIVE WASTE MANAGEMENT FACILITY

See waste management facility, radioactive

RADIOACTIVITY

The phenomenon whereby atoms undergo spontaneous random disintegration, usually accompanied by the emission of radiation. In Agency publications, radioactivity should be used only to refer to the phenomenon. To refer to an amount of a radioactive substance, use activity.

REGULATORY AUTHORITY

An authority or authorities designated or otherwise recognized by a government for regulatory purposes in connection with protection and safety. [1]. The term Regulatory Authority may be used (with initial capitals) when consistency with the BSS is necessary. However, in general, the term regulatory body is preferred.

REGULATORY BODY

An authority or number of authorities designated by the government as having legal authority for conducting the regulatory process, including issuing authorizations, and thereby regulating nuclear, radiation, waste and transport safety and radiation protection.

REGULATORY CONTROL

See control

REMEDIAL ACTION

Action taken when a specified action level is exceeded, to reduce radiation doses that might otherwise be received, in an intervention situation involving chronic exposure [1]. Remedial actions could also be termed longer term protective action, but longer term protective actions are not necessarily remedial actions.

REMEDIATION

See cleanup

REPOSITORY

A facility where waste is emplaced for disposal.

geological repository: A facility for radioactive waste disposal located underground (usually several hundred metres or more below the surface) in a stable geological formation to provide long term isolation of radionuclides from the biosphere.

near surface repository: A facility for radioactive waste disposal located at or within a few tens of metres of the Earth's surface.

rock cavity: A facility for radioactive waste disposal located at depths intermediate to geological and near surfce repositories.

REPROCESSING

A process or operation, the purpose of which is to extract radioactive isotopes from spent fuel for further use.

RING-DIKE IMPOUNDMENT

A confinement basin for tailings formed by constructing a single self-closing embankment. They are usually used on relatively flat terrain. The impoundment could be square, rectangular, curved or irregular.

RIPRAP

A layer of large stones, broken rock or precasted blocks placed in a random fashion on the surface of an embankment dam or the sides of a channel to protect against soil erosion, reduce intrusion by animals, stabilize tailings embankments, etc.

SEABED DISPOSAL

See disposal

SEALED SOURCE

See source

SEGREGATION

See waste management, radioactive

SHORT LIVED WASTE

See waste classes

SITING

The process of selecting a suitable site for a facility, including appropriate assessment and definition of the related design bases. The siting process for a repository is particularly crucial to its long term safety; it may therefore be a particularly extensive process, and is divided into the following stages:

concept and planning;
area survey;
site characterization; and
site confirmation.

SOURCE

(a) Anything that may cause radiation exposure, such as by emitting ionizing radiation or by releasing radioactive substances or materials, and can be treated as a single entity for protection and safety purposes.

For example, materials emitting radon are sources in the environment, a sterilization gamma irradiation unit is a source for the practice of radiation preservation of food, an X ray unit may be a source for the practice of radiodiagnosis; a nuclear power plant is part of the practice of generating electricity by nuclear fission, and may be regarded as a source (e.g. with respect to discharges to the environment) or as a collection of sources (e.g. for occupational radiation protection purposes). A complex or multiple installation situated at one location or site may, as appropriate, be considered a single source for the purposes of application of safety standards.

natural source: A naturally occurring source of radiation, such as the sun and stars (sources of cosmic radiation) and rocks and soil (terrestrial sources of radiation).

(b) Radioactive material used as a source of radiation, such as those used for medical applications or in industrial instruments. These are sources as defined above but this usage is less general.

disused source: A source no longer in use or intended to be used.

The Joint Convention [7] refers to ‘disused sealed sources’, but does not define them.

Note that a disused source may still represent a significant radiological hazard. It differs from a spent source in that it may still be capable of performing its function; it may be disused because it is no longer needed.

orphan source: A source which poses sufficient radiological hazard to warrant regulatory control, but which is not under regulatory control because it has never been so, or because it has been abandoned, lost, misplaced, stolen or otherwise transferred without proper authorization.

sealed source: Radioactive material that is (a) permanently sealed in a capsule, or (b) closely bonded and in a solid form.

The Joint Convention definition [7] is identical, except that the words “excluding reactor fuel elements” are added. The BSS definition [1] is as above, but continues: “The capsule or material of a sealed source shall be strong enough to maintain

leaktightness under the conditions of use and wear for which the source was designed, also under foreseeable mishaps."

The term special form radioactive material, used in the context of transport of radioactive materials, has essentially the same meaning.

spent source: A source that is no longer suitable for its intended purpose as a result of radioactive decay. Note that a spent source may still represent a radiological hazard.

unsealed source: A source that does not meet the definition of a sealed source.

SOURCE MONITORING

See monitoring

SPENT FUEL

Nuclear fuel removed from a reactor following irradiation, which is no longer usable in its present form because of depletion of fissile material, poison build-up or radiation damage.

The adjective 'spent' suggests that spent fuel cannot be used as fuel in its present form (as, for example, in spent source). In practice, however, spent fuel is commonly used to refer to fuel that has been used as fuel but will no longer be used, whether or not it could be (which might more accurately be termed 'disused fuel').

SPENT FUEL MANAGEMENT

All activities that relate to the handling or storage of spent fuel, excluding off-site transportation. It may also involve discharges. [7]

SPENT FUEL MANAGEMENT FACILITY

Any facility or installation the primary purpose of which is spent fuel management. [7]

SPENT SOURCE

See source

STORAGE

The holding of spent fuel or of radioactive waste in a facility that provides for its containment, with the intention of retrieval. [7]

Storage is by definition an interim measure, and the term interim storage would therefore be appropriate only to refer to short-term, temporary storage when contrasting this with the longer term fate of the waste. Storage as defined above should not be described as interim storage.

SUB-SEABED DISPOSAL

See disposal

SUPPLIER

Any legal person to whom a registrant or licensee delegates duties, totally or partially, in relation to the design, manufacture, production or construction of a source. (An importer of a source is considered a supplier of the source.) [1]

TANK

A tank container, a portable tank, a road tank vehicle, a rail tank wagon or a receptacle with a capacity of not less than 450 litres intended to contain liquids, powders, granules, slurries or solids which are loaded as gas or liquid and subsequently solidified, and of not less than 1000 litres intended to contain gases. A tank container shall be capable of being carried on land or on sea and of being loaded and discharged without the need of removal of its structural equipment, shall possess stabilizing members and tie-down attachments external to the shell, and shall be capable of being lifted when full. [2]

TRANSBOUNDARY EXPOSURE

Exposure of members of the public in one State due to radioactive materials released via accidents, discharges or waste disposal in another State.

TRANSBOUNDARY MOVEMENT

Any movement of radioactive material from one State to or through another.

UNRESTRICTED USE

See use

UNSEALED SOURCE

See source

URANIUM

depleted uranium**:** Uranium containing a lesser mass percentage of uranium-235 than in natural uranium. [2]

enriched uranium**:** Uranium containing a greater mass percentage of uranium-235 than 0.72%. [2]

highly enriched uranium (HEU): Uranium with a proportion of ^{235}U high enough for use in nuclear weapons, typically over 90% by mass.

low enriched uranium (LEU): Enriched uranium containing a lesser mass percentage of uranium-235 than 20%.

natural uranium**:** Chemically separated uranium containing the naturally occurring distribution of uranium isotopes (approximately 99.28% uranium-238, and 0.72% uranium-235 by mass) [2]. This corresponds to 48.9% ^{234}U, 2.2% ^{235}U and 48.9% ^{238}U by activity.

USE

authorized use: Use of radioactive materials or radioactive objects from an authorized practice in accordance with an authorization.

Intended primarily for contrast with clearance, in that clearance implies no further regulatory control over the use, whereas the authorization for authorized use may prescribe or prohibit specific uses.

A form of restricted use.

restricted use: The use of an area or of materials, subject to restrictions imposed for reasons of radiation protection and safety.

Restrictions would typically be expressed in the form of prohibition of particular activities (e.g. house building, growing or harvesting particular foods) or prescription of particular procedures (e.g. materials may only be recycled or reused within a facility).

unrestricted use: The use of an area or of materials without any radiologically based restrictions.

[VERY LOW LEVEL WASTE (VLLW)]

See waste classes

VOLUME REDUCTION

See waste management, radioactive

WASTE

Material for which no further use is foreseen.

See also waste, radioactive and waste classes.

WASTE, RADIOACTIVE

For legal and regulatory purposes, waste that contains or is contaminated with radionuclides at concentrations or activities greater than clearance levels as established by the regulatory body. It should be recognized that this definition is purely for regulatory purposes and that waste with activity concentrations equal to or less than clearance levels is radioactive from a physical viewpoint, although the associated radiological hazards are considered negligible.

Material, whatever its physical form, remaining from practices or interventions and for which no further use is foreseen (i) that contains or is contaminated with radioactive substances and has an activity or activity concentration higher than the level for clearance from regulatory requirements, and (ii) exposure to which is not excluded from the Standards. [1]

WASTE ACCEPTANCE REQUIREMENTS

Quantitative or qualitative criteria specified by the regulatory body, or specified by an operator and approved by the regulatory body, for radioactive waste to be accepted by the operator of a repository for disposal, or by the operator of a storage facility for storage. Waste acceptance requirements might include, for example, restrictions on the activity concentration or total activity of particular radionuclides (or types of radionuclide) in the waste or requirements concerning the waste form or packaging of the waste.

WASTE CLASSES

Refer to the subsection, "**The Classification of Radioactive Waste**" (accessed by clicking on the preceding, red, underlined text) in the Introduction section of the Radioactive Waste Management Profiles, No. 3 for definitions of:

Exempt waste (EW)
Low and Intermediate Level Waste (LILW)
Low and Intermediate Level Waste - Short Lived (LILW-SL)
Low and Intermediate Level Waste - Long Lived (LILW-LL)
High Level Waste (HLW)

Decommissioning Waste (DW): radioactive waste from decommissioning activities. Classified on the basis of origin, DW is often identified as a distinct waste class because (a) it can represent relatively large sources of waste and (b) it arises late in the life cycle of a facility. DW represents a future liability, which requires advanced planning, such as the establishment of decommissioning funds, to ensure that adequate resources are available to manage DW when they arise. Radiologically, DW are comprised mainly of LILW.

[heat generating waste (HGW)]: Radioactive waste which is sufficiently radioactive that the decay heat significantly increases its temperature and the temperature of its surroundings. In practice, HGW is normally HLW, although some types of LILW may qualify as HGW.

[medium level waste (MLW)]: See LILW

NORM waste: NORM that has been declared to be waste

technologically enhanced NORM waste (TE NORM waste): TE NORM (see the definition of naturally occurring radioactive material) that has been declared to be waste

Uranium Mine and Mill Tailings (UMMT): wastes arising from the mining and/or milling of ores containing uranium series or thorium series radionuclides (Note, in some Member States, UMMT are not considered as waste - instead, they are considered as a minerals resource.)

[very low level waste (VLLW)]: Radioactive waste considered suitable by the regulatory body for authorized disposal, subject to specified conditions, with ordinary waste in facilities not specifically designed for radioactive waste disposal

The following waste classes are defined, individually, elsewhere in this glossary:
Alpha (TRU) Waste,
Spent, Sealed Radiation Sources (SRS), and
Spent Fuel (SF), if declared as waste.

WASTE CANISTER

See container, waste

WASTE CHARACTERIZATION

See characterization

WASTE CONDITIONING

See waste management, radioactive

WASTE CONTAINER

See container, waste

WASTE DISPOSAL

See disposal

WASTE FORM

Waste in its physical and chemical form after treatment and/or conditioning (resulting in a solid product) prior to packaging. The waste form is a component of the waste package.

WASTE GENERATOR

The operating organization of a facility or activity that generates waste.

For convenience, the scope of the term waste generator is sometimes extended to include whoever currently has the responsibilities of the waste generator (e.g. if the actual waste

generator is unknown or no longer exists, and a successor organization has assumed responsibility for the waste).

WASTE MANAGEMENT, RADIOACTIVE

All administrative and operational activities involved in the handling, pretreatment, treatment, conditioning, transport, storage and disposal of radioactive waste. Refer to the subsection, "**Basic Steps In Radioactive Waste Management**" (accessed by clicking on the preceding, red, underlined text) in the Introduction section of the Radioactive Waste Management Profiles, No. 3:

> conditioning: Those operations that produce a waste package suitable for handling, transport, storage and/or disposal. Conditioning may include the conversion of the waste to a solid waste form, enclosure of the waste in containers and, if necessary, providing an overpack.
>
> disposal: defined elsewhere in this glossary
>
> immobilization: The conversion of waste into a waste form by solidification, embedding or encapsulation. Immobilization reduces the potential for migration or dispersion of radionuclides during handling, transport, storage and disposal.
>
> overpack: A secondary (or additional) outer container for one or more waste packages, used for handling, transport, storage or disposal.
>
> packaging: The preparation of radioactive waste for safe handling, transport, storage and disposal by means of enclosing conditioned waste in a suitable container.
>
> predisposal: Any waste management steps carried out prior to disposal, such as pretreatment, treatment, conditioning, storage and transport activities. Decommissioning is considered to be included within the scope of predisposal. Predisposal, a contraction of 'pre-disposal management', is not a form of disposal.
>
> pretreatment: Waste management operations that do not change the main characteristics of the waste, such as collection, segregation and decontamination of surfaces. These processes precede waste treatment.
>
> processing: Any operation that changes the characteristics of a waste, including pretreatment, treatment and conditioning.
>
> segregation: An activity where waste or materials (radioactive and exempt) are separated or are kept separated according to radiological, physical and/or chemical properties, which can facilitate handling, processing, storage and/or disposal.
>
> storage: defined elsewhere in this glossary
>
> treatment: Operations intended to benefit safety and/or economy by changing the characteristics of the waste. Three basic treatment objectives are (a) volume reduction, (b) removal of radionuclides from the waste, and (c) change of composition of the waste.
>
> volume reduction: a treatment method that reduces the physical volume of waste (should not be confused with minimization)

WASTE MANAGEMENT FACILITY, RADIOACTIVE

Facility specifically designated to handle, treat, condition, temporarily store or permanently dispose of radioactive waste. [1]

WASTE PACKAGE

See package, waste

WEAKLY PENETRATING RADIATION

See radiation

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