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## Abbreviations

ADF	Australian Defence Force
ANRDR	Australian National Radiation Dose Register
ANSTO	Australian Nuclear Science and Technology Organisation
APDS	ARPANSA Performance and Development System
APS	Australian Public Service
ARGOS	Accident Reporting and Guidance Operating System
ARIR	Australian Radiation Incident Register
ARL	Australian Radiation Laboratory
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASNO	Australian Safeguards and Non-Proliferation Office
CAG	Clinical Advisory Group
CEO	Chief Executive Officer
CLC	common law contract
COAG	Council of Australian Governments
CPGs	Commonwealth Procurement Guidelines
CSA	Compliance Self Assessment
CSS	International Atomic Energy Agency's Commission on Safety Standards
CT	computed tomography
CTBT	Comprehensive Nuclear-Test-Ban Treaty
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organization
Customs	Australian Customs and Border Protection Service
DoHA	Department of Health and Ageing
DRLs	diagnostic reference levels
ELF	extremely low frequency
EME	electromagnetic energy
EMF	electric and magnetic fields
EMR	electromagnetic radiation
ERICA	Environmental Risk from Ionising Contaminants: Assessment and Management
FLIR	Forward Looking Infrared
FMA Act	Financial Management and Accountability Act 1997
FOI Act	Freedom of Information Act 1982
GICNT	Global Initiative to Combat Nuclear Terrorism
HIFAR	High-Flux Australian Research Reactor
Hz	hertz
IAEA	International Atomic Energy Agency
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICRP	International Commission on Radiological Protection
ICT	information and communication technology
ILW	intermediate-level waste
IM	information management
IMP	Incident Management Plan
IMS	International Monitoring System
IPLs	Intense Pulsed Light Devices
IPS	Information Publication Scheme
IRRS	International Regulatory Review Service (IAEA)

KPIs	key performance indicators
linac	medical linear accelerator
LLW	low-level waste
MARTAC	Maralinga Rehabilitation Technical Advisory Committee
MDCT	multidetector computed tomography
MoU	Memorandum of Understanding
NATA	National Association of Testing Authorities
NDRLD	National Diagnostic Reference Level Database
NDRP	National Directory for Radiation Protection
NDWG	Nuclear Detection Working Group
NORM	naturally occurring radioactive material
NPL	National Physical Laboratories
NPW	Nuclear Powered Warship
NSB	Nuclear Safety Bureau
NSC	Nuclear Safety Committee
OHS	Occupational Health and Safety
OPAL	Open Pool Australian Light-water [research reactor]
P&C	People and Culture
PP&S	Physical Protection and Security
PRL	Practice Reference Level
PRMS	Personal Radiation Monitoring Service
PSR	Periodic Safety Review
QMC	Quality Management Committee
QMC	Quality Management Committee
RF	radiofrequency
RHC	Radiation Health Committee
RHS	Radiation Health Series
RIS	Regulatory Impact Statement
RPS	Radiation Protection Series
RWMC	Radioactive Waste Management Committee
SCF	Staff Consultative Forum
SES	Senior Executive Service
SMC	Strategic Management Committee
TGA	Therapeutic Goods Administration
the ARPANS Act	Australian Radiation Protection and Nuclear Safety Act 1998
the Council	Radiation Health and Safety Advisory Council
TRANSSC	Transport Safety Standards Committee (TRANSSC)
TWG	Technical Working Group
UAE	United Arab Emirates
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
UPF	Ultraviolet Protection Factor
UTS	Ultraviolet Testing Service
UVR	ultraviolet radiation
VSPN	Visiting Ships Panel (Nuclear)
WASSC	Waste Safety Standards Committee (IAEA)
WHO	World Health Organization
WHSC	Work Health and Safety Committee

## Glossary

### *absorbed dose*

The energy absorbed per unit mass by matter from ionising radiation which impinges upon it.

### *accident*

An unintended event which causes, or has the potential to cause, employees or members of the public to be exposed to radiation from which the individual doses or collective doses received do not lie within the range of variation which is acceptable for normal operation. An accident may result from human error, equipment failure or other mishap; it may require emergency action to save life or to safeguard health, property or the environment; it requires investigation of its causes and consequences and, possibly, corrective action within the program for control of radiation; and it may require remedial action to mitigate its consequences.

### *activity*

The measure of quantity of radioactive decay.

### *air kerma*

The measure of the energy released in a volume of air at some distance from a radioactive source.

### *AS/ISO*

Standard established by Standards Australia and the International Organization for Standardization.

### *Australian National Radiation Dose Register*

A centralised repository for the radiation dose records of workers as supplied by the employers, maintained by ARPANSA. It is currently limited to those engaged in the uranium mining and milling industry in Australia.

### *Code of Practice for radiation protection*

A document prescribing specific requirements for radiation protection in a particular application.

### *computed tomography*

Pictures of structures within the body created by a computer that takes the data from multiple X-ray images and turns them into pictures.

### *constraint*

Either dose constraint in the case of exposures anticipated to be received, or risk constraint in the case of potential exposures (see dose constraint and risk constraint).

### *controlled apparatus – as defined in the ARPANS Act*

- (a) An apparatus that produces ionising radiation when energised or that would, if assembled or repaired, be capable of producing ionising radiation when energised

- (b) An apparatus that produces ionising radiation because it contains radioactive material, or
- (c) An apparatus prescribed by the Regulations that produces harmful non-ionising radiation when energised.

### *controlled material – as defined in the ARPANS Act*

Any natural or artificial material, whether in solid or liquid form, or in the form of a gas or vapour, which emits ionising radiation spontaneously.

### *Design Basis Threat (DBT)*

a description of the attributes and characteristics of potential insider and/or external adversaries who might attempt unauthorised removal of nuclear material or sabotage against which a physical protection system is designed and evaluated.

### *diagnostic reference levels (DRLs)*

Dose levels for medical exposures in medical radio-diagnostic practices, or levels of activity in the case of radiopharmaceuticals, applied to groups of standardised patients or standard phantoms for common types of diagnostic examination and broadly defined types of equipment. These levels are expected not to be consistently exceeded for standard procedures when good and normal practice regarding diagnostic and technical performance is applied. DRLs will be set by relevant professional bodies and published by ARPANSA or the relevant regulatory authority from time to time.

### *dose*

A generic term which may mean absorbed dose, equivalent dose or effective dose depending on context.

### *dose constraint*

A prospective restriction on anticipated dose, primarily intended to be used to discard undesirable options in an optimisation calculation. In occupational exposure, a dose constraint may be used to restrict the options considered in the design of the working environment for a particular category of employee. In medical exposure, a dose constraint for volunteers in medical research may be used to restrict the options considered in the design of an experimental protocol. In public exposure, a dose constraint may be used to restrict the exposure of the critical group from a particular source of radiation.

### *dosemeters*

An instrument used to determine the presence and sometimes the amount of radiation.

### *dosimetry*

The theory and application of the principles and techniques involved in the measurement, calculation and recording of radiation doses.

### **effective dose**

A measure of dose which takes into account both the type of radiation involved and the radiological sensitivities of the organs and tissues irradiated.

### **electromagnetic energy**

The energy stored in an electromagnetic field. Expressed in joule (J).

### **equivalent dose**

A measure of dose which takes into account the type of radiation involved.

### **exemption**

The deliberate omission of a practice from regulatory control, or from some aspects of regulatory control, by the appropriate authority.

### **exposure**

The circumstance of being exposed to radiation.

### **extremely low frequency radiation**

Has very long wavelengths (in the order of a thousand kilometres or more) and frequencies in the range of 100 hertz or less.

### **gamma ray**

Ionising electromagnetic radiation emitted by a radionuclide during radioactive decay or during a nuclear (isomeric) transition.

### **incident**

An event which causes, or has the potential to cause, abnormal exposure of employees or of members of the public and which requires investigation of its causes and consequences and may require corrective action within the program for control of radiation, but which is not of such scale as to be classified as an accident.

### **Integrated Regulatory Review Service**

A peer review and appraisal service offered by the IAEA to strengthen and enhance the effectiveness of a national regulatory system in nuclear, radiation, radioactive waste, transport safety and nuclear security.

### **Intense Pulsed Light Devices (IPLs)**

Instruments that use a full spectrum (noncoherent), non-laser, broadband, filtered Xenon flash lamps. Flash lamps emit in the UVR, visible and IR region of the electromagnetic spectrum. The UVR and IR wavelength components of the emissions are blocked using specific cut-off filters. These properties allow for variability in selecting individual treatment parameters and adapting to different skin types. IPLs are generally used for hair removal. There are other applications such as removal of skin pigmentation, wrinkles and the treatment of certain skin disorders by dermatologists.

### **ionisation**

The process by which one or more electrons are removed from, or sometimes added to, an atom leaving the atom in a charged state.

### **ionising radiation**

Radiation which is capable of causing ionisation

### **ISO Series**

Internationally accepted standards developed by the International Organization for Standardization which is a network of the national standards institutes of 157 countries, one member per country, with a Central Secretariat in Geneva, Switzerland, that coordinates the system.

### **justification**

The notion that human activities which lead to exposure to radiation should be justified, before they are permitted to take place, by showing that they are likely to do more good than harm.

### **licence**

A written authorisation issued to an operator which allows the operator to carry out an operation legally.

### **limitation**

The requirement that radiation doses and risks should not exceed a value regarded as unacceptable.

### **linear accelerator**

Radiation therapy relies on the use of ionising radiation to kill cancerous cells. The most common forms of ionising radiation used in radiotherapy are high energy photons and electrons. A Linear Accelerator, or Linac, is the standard method of producing photons and electrons for radiation therapy treatments. Linacs account for the majority of radiotherapy treatment machines in Australia. Linacs are computer driven machines that deliver precise, known doses of radiation to treat cancer patients.

### **medical cyclotrons**

A medical cyclotron is an electrical device for accelerating charged particles in a spiral fashion to high energies. The beams produced are used to manufacture Positron Emission Tomography (PET) radioisotopes which are subsequently injected into patients for medical imaging. The main clinical areas of diagnosis are oncology, cardiology and neurology.

### **medical exposure**

Exposure of a person to radiation received as a patient undergoing medical diagnosis or therapy, or as a volunteer in medical research, or non-occupational exposure received as a consequence of assisting an exposed patient.

### ***non-ionising radiation***

Ranges from extremely low frequency radiation through the radiofrequency, microwave, and visible portions of the spectrum into the ultraviolet range.

### ***occupational exposure***

Exposure of a person to radiation which occurs in the course of that person's work and which is not excluded exposure.

### ***operator***

Any person or entity responsible for an operation which may lead to exposure to ionising radiation.

### ***optimisation***

a process or method used to make a system of radiation protection as effective as possible within the given criteria and constraints.

### ***program of radiation protection***

An instance of a system of radiation protection, designed for a particular operation.

### ***public exposure***

Exposure of a person, or persons, to radiation which is neither occupational nor medical exposure.

### ***radiation***

Electromagnetic waves or quanta, and atomic or sub-atomic particles, propagated through space or through a material medium.

### ***radioactive material***

Material which spontaneously emits ionising radiation as a consequence of radioactive decay.

### ***radiofrequency***

Electromagnetic energy with frequencies in the range 3 kHz to 300 GHz.

### ***radiofrequency field***

A physical field, which specifies the electric and magnetic states of a medium or free space, quantified by vectors representing the electric field strength and the magnetic field strength.

### ***radiological emergency***

An emergency in which there is, or is perceived to be, a hazard due to:

- (a) the energy resulting from a nuclear chain reaction or from the decay of the products of a chain reaction, or
- (b) radiation exposure.

### ***radionuclide***

A species of atomic nucleus which undergoes radioactive decay.

### ***radiopharmaceutical***

A radioactive pharmaceutical administered to patients for medical diagnosis or therapy.

### ***radon***

Radon is a radioactive noble gas which is part of the uranium decay chain. Radon and some of its decay products are alpha particle emitters. Radon decays to form a series of short-lived radionuclides: Po-218, Pb-214, Bi-214 and Po-214. If these radionuclides are breathed in, they can attach to the lungs and respiratory tract. The subsequent radiological dose is recognised as one cause of lung cancers (WHO 2009; ICRP 2010).

### ***Regulatory Impact Statement***

A Regulatory Impact Statement (RIS) is required, under the Australian Government's requirements, when a regulatory proposal is likely to have significant impacts on business and individuals or the economy. The primary role of the RIS is to improve government decision-making processes by ensuring that all relevant information is presented to the decision maker when a policy decision is being made. A RIS is prepared for each of ARPANSA's Codes of Practice and Standards and contains a cost benefit analysis.

### ***solaria***

Salons for artificial sun tanning through exposure to ultraviolet radiation.

### ***system of radiation protection***

A generic process of radiation risk management designed to limit the health risks arising from exposure to radiation to acceptable levels in a manner which takes economic and social considerations into account.

### ***UV Index Data***

Simple numerical indication of the maximum solar UVR during the day, the higher the number, the higher the UVR hazard. The UV index is calculated from data collected by broadband detectors which measure the UV radiation from the sun. It is a scale primarily used in daily forecasts aimed at the general public.

### ***X-ray***

Ionising electromagnetic radiation emitted during the transition of an atomic electron to a lower energy state or during the rapid deceleration of a charged particle.

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