	Policy	
---	--------	--

Title: **Radiation Protection and the Safety of Radiation Sources Policy** Document Identifier: **32-227**

Alternative Reference **NIN-0298**  
Number:

Area of Applicability: **Eskom Holdings SOC Ltd**

Functional Area: **Eskom Division**

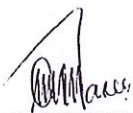
Revision: **3**

Total Pages: **17**

Next Review Date: **August 2024**

Disclosure **Controlled Disclosure**  
Classification:

Compiled by



M Maree

Corporate Specialist

Date: 27.09.2021

Functional  
Responsibility



R Bakardien

Divisional Executive:  
Chief Nuclear Officer

Date: 27-09-2021

Supported by




J Oberholzer

Chief Operating  
Officer

Date: 27/09/2021

Authorized by



A de Ruyter

Group Chief Executive  
Eskom Holdings SOC Ltd

Date: 29/9/21

## **Content**

	Page
1. Introduction.....	3
2. Policy Content .....	3
2.1 Policy Statement .....	3
2.2 Policy Principles or Rules .....	4
3. Supporting Clauses .....	9
3.1 Scope.....	9
3.1.1 Purpose.....	9
3.1.2 Applicability .....	9
3.1.3 Effective date.....	9
3.2 Normative/Informative References .....	9
3.2.1 Normative.....	9
3.2.2 Informative.....	10
3.3 Definitions .....	10
3.4 Abbreviations .....	15
3.5 Roles and Responsibilities .....	15
3.6 Process for Monitoring.....	15
4. Authorization .....	16
5. Revisions.....	16
6. Development Team .....	16
7. Acknowledgements .....	17

### **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30.

## **1. Introduction**

Sources of ionising radiation are used at Eskom Holdings SOC Ltd (Eskom) facilities in various applications. This document sets out Eskom's Radiation Protection and the Safety of Radiation Sources Policy incorporating principles that, when applied, will ensure the protection of Eskom employees, contractors and subcontractors, without detracting from their status as employers or users, who are occupationally exposed to radiation at Eskom facilities.

All ionising radiation exposures must be controlled to prevent the occurrence of deterministic effects (harmful tissue reactions) in individuals by keeping radiation exposures below the relevant threshold and to ensure that all reasonable steps are taken to reduce the occurrence of stochastic effects (cancer or heritable effects) by maintaining effective defence in depth against radiation risks due to naturally occurring or artificial radiation sources employed at Eskom facilities.

The fundamental safety objective of the Eskom Radiation Protection and the Safety of Radiation Sources Policy is to protect persons, property and the environment from harmful effects of ionising radiation. This objective must be achieved without unduly limiting the operation of Eskom facilities or the conduct of activities that give rise to radiation risks. Therefore, the system of radiation protection aims to assess, manage and control exposure to ionising radiation so that radiation risks, including risks of health effects and risks to the environment, are reduced to the extent reasonably achievable.

## **2. Policy Content**

### **2.1 Policy Statement**

The Eskom Radiation Protection and the Safety of Radiation Sources Policy sets out principles and overarching rules which are aligned with the Nuclear Energy Policy for the Republic of South Africa which states that: *"In pursuing a national nuclear energy programme there shall be full commitment to ensure that nuclear and radiation safety receives the highest priority to provide for the protection of persons, property and the environment"*.

Eskom's commitment to ensure that radiation safety receives the highest priority to provide for the protection of persons, property and the environment will be achieved through:

- a) Implementation of recommendations for a system of radiation protection derived by the International Commission on Radiological Protection and approved by the relevant regulatory body;
- b) Implementation of requirements for a system of radiation protection derived by the International Atomic Energy Agency and approved by the relevant regulatory body;
- c) Implementation of legal and governmental frameworks, policies, statutes, regulations, government notices, regulatory documents, codes of practice and guidelines for a system of radiation protection approved by the relevant regulatory body;
- d) Establishment of effective and sustained radiation protection leadership and management for Eskom facilities to mitigate radiation risks;
- e) Ensuring that Eskom facilities that give rise to radiation risks yield an overall benefit;

### **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- f) Optimisation of radiation protection to provide the highest level of safety that can reasonably be achieved;
- g) Measures for controlling radiation risks to ensure that no individual bears an unacceptable risk of harm;
- h) Protection of persons, property and the environment, present and future, against radiation risks;
- i) Practical efforts to prevent and mitigate nuclear or radiation accidents;
- j) Arrangements for emergency preparedness and response for nuclear or radiation incidents; and
- k) Justification for protective actions and optimisation of protection and safety to reduce existing or unregulated radiation risks.

## **2.2 Policy Principles or Rules**

Eskom's commitment to ensure that radiation safety receives the highest priority to provide for the protection of persons, property and the environment will be achieved through implementation of the following principles and overarching rules:

### **2.2.1. Compliance with a legal and regulatory framework**

- a) Eskom shall comply with the legal and regulatory framework for radiation protection established by the Government of the Republic of South Africa.

### **2.2.2. Compliance with regulatory requirements**

- a) Eskom shall comply with radiation protection requirements for the application of the principles addressed in this Policy as established by the relevant regulatory body.

### **2.2.3. Responsibilities for radiation protection**

- a) Eskom shall primarily be responsible for the application of these radiation protection principles at Eskom facilities that give rise to radiation risks.
- b) Other parties working at Eskom facilities shall have specified responsibilities for radiation protection.

### **2.2.4. Management for radiation protection**

- a) Eskom shall ensure that management systems for radiation protection and safety of sources are established, implemented and maintained;
- b) Eskom shall ensure that radiation protection is effectively integrated into the overall management system of the organisation.

### **2.2.5. Eskom shall ensure that application of the radiation protection principles for planned exposure situations are commensurate with the characteristics of the radiation risk at the Eskom facilities and with the magnitude and likelihood of radiation exposures.**

## **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- 2.2.6. Eskom shall submit to the relevant regulatory body, as appropriate, a notification or an application for authorisation to site, construct, operate, and decommission Eskom facilities that give rise to radiation risks.
- 2.2.7. Eskom shall be responsible for radiation protection in planned exposure situations at Eskom facilities.
- 2.2.8. Justification of radiation protection
- a) Eskom shall ensure that actions and applications using radioactive sources are justified on the grounds that they produce sufficient benefit to Eskom and to society to offset the radiation detriment that they may cause;
  - b) Any actions and applications using radioactive sources proposed shall do more good than harm. The form, scale and duration of any intervention shall be optimised so that the net benefit is maximised.
- 2.2.9. Optimisation of radiation protection
- a) Eskom shall establish and apply optimisation of radiation protection for protection of persons, property and the environment.
  - b) Eskom shall ensure that radiation exposure of individuals and the public are maintained as low as reasonably achievable by applying the ALARA principle;
- 2.2.10. Eskom shall implement and comply with dose limits for occupational exposure and public exposure prescribed by the relevant regulatory body. Restrictions on the radiation dose shall be to ensure that no person is subject to an unacceptable risk attributable to radiation exposure.
- 2.2.11. Eskom shall conduct an appropriate safety assessment of an Eskom facility or activity that gives rise to radiological risks in accordance with requirements established by the relevant regulatory body.
- 2.2.12. Eskom shall conduct radiological reviews and monitoring periodically to verify radiation protection records and assess compliance to the radiation protection principles in this Policy for protection and safety of people and the environment.
- 2.2.13. Eskom shall apply good engineering practice and shall take all practicable measures to prevent nuclear and/or radiological accidents and to mitigate the consequences of those accidents that do occur.
- 2.2.14. Eskom shall conduct formal investigations of abnormal radiological conditions arising in the operation of facilities or the conduct of activities, and shall disseminate information that is significant for protection and safety of persons, property and the environment.
- 2.2.15. Radiation generators and radioactive sources
- a) Eskom shall ensure the safety of radiation generators and/ radioactive sources on Eskom premises.
  - c) Eskom shall ensure that the design and construction of radiation generators and/or radioactive sources installed on Eskom premises are reliable, stable and easily operated to ensure protection and safety with a high level of confidence;
  - d) Eskom shall ensure that the operation and use of radiation generators and/or radioactive sources are based upon procedures and conditions that ensure the safety and security of the radioactive source;

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- e) Eskom shall ensure that potential exposure of workers and members of the public is taken into account when positioning or locating a radiation generator or radioactive source on Eskom premises.

2.2.16. Eskom shall ensure, for all workers engaged in activities in which they are or could be subject to occupational exposure, that:

- a) Requirements for the monitoring and recording of occupational exposures in planned exposure situations be established and implemented.
- b) Suitable and adequate facilities, monitoring equipment, personal protective equipment and services for radiation protection are provided;
- c) Adequate radiation protection records are maintained;
- d) Arrangements are made to facilitate consultation of and cooperation with workers, through their representatives where appropriate, with regard to radiation protection on all measures necessary to achieve the effective application of the radiation protection principles;
- e) Necessary conditions for promoting a radiation safety culture are provided.

2.2.17. Workers on Eskom premises shall fulfil their obligations and carry out their duties in accordance with the radiation protection principles addressed in this document.

2.2.18. Eskom shall cooperate to the extent necessary for compliance by all responsible parties with the radiation protection principles for protection and safety of persons, property and the environment.

2.2.19. Eskom shall establish and maintain organisational, procedural and technical arrangements for the designation of controlled areas and supervised areas, for local rules and for monitoring of the workplace, in a radiation protection programme for occupational exposure.

2.2.20. Eskom shall be responsible for making arrangements for assessment and recording of the occupational exposure and for workers' health surveillance.

2.2.21. Information, instruction and training

- a) Eskom shall provide workers with adequate information, instruction and training on radiation protection for protection and safety of persons, property and the environment.
- b) Adequate numbers of suitably qualified and experienced radiation protection personnel are trained and maintained for the safety of sources and interventions, with a clear allocation of responsibilities;

2.2.22. Eskom shall not offer benefits as substitutes for radiation protection measures for protection and safety of persons, property and the environment.

2.2.23. Special arrangements

- a) Eskom shall ensure that there are special arrangements in place for appropriate radiation protection in cases where a female worker is or might be pregnant or is breast-feeding. Special arrangements are necessary, for protection of the embryo or foetus and of breast-fed infants.
- b) Eskom shall in consultation with the relevant regulatory body make special arrangements for protection and safety for persons under 18 years of age who are undergoing training in radiological controlled zones.

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30



2.2.24. Eskom responsibilities to public exposure

- a) Eskom shall comply with public exposure dose constraints and dose limits prescribed by the relevant regulatory body. Eskom shall ensure that public exposure is optimised and that the dose limits for public exposure are not exceeded.
- b) Eskom shall apply the system of protection and safety to protect members of the public against exposure as required by the relevant regulatory body.

2.2.25. Eskom shall ensure that radioactive waste and discharges of radioactive material to the environment are managed:

- a) In accordance with the relevant authorisations.
- b) As to secure an acceptable level of protection for human health.
- c) As to provide an acceptable level of protection of the environment, including natural resources.
- d) As to ensure that the possible effects on human health and the environment beyond national borders will be taken into account.
- e) That predicted impacts on the health of future generations will not be greater than relevant levels of impact that are acceptable today.
- f) That will not impose undue burdens on future generations.
- g) Within an appropriate national legal framework, including clear allocation of responsibilities and the provision for independent assurance functions.

2.2.26. Eskom shall ensure that:

- a) The generation of radioactive waste are kept to the minimum practicable.
- b) Interdependencies among all steps in radioactive waste generation and management are appropriately taken into account.
- c) The safety of Eskom facilities for radioactive waste management is appropriately assured during each phase of the facility's lifecycle.
- d) The financial burden for the management of radioactive waste is accounted for.
- e) All radioactive waste management activities are conducted in an open and transparent manner and the public shall have access to information regarding waste management where this does not infringe on the security of radioactive material.
- f) Decision-making are based on proven scientific information and recommendation of competent national and international institutions dealing with radioactive waste management.
- g) Where there is uncertainty about the safety of an activity a conservative approach is adopted.
- h) In principle Eskom will neither import nor export radioactive waste.
- i) All activities involving radioactive waste management are managed in a manner that prevents duplication of effort and maximises coordination.
- j) Radioactive waste management take into account the interests and concerns of all interested and affected parties, when decisions are being made.

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- k) Opportunities are created to develop the worker's understanding, skills and general capacity concerning radioactive waste management actions and processes in Eskom.
- l) Development and ongoing review of site specific waste management plans.
- m) The execution of waste management plans and processes and the development of site and/or industry specific waste management systems.
- n) Waste management plans and systems reflect principles of sustainable development and continued improvement.

2.2.27. Eskom shall implement programmes for source monitoring and environmental monitoring and the results from the monitoring shall be recorded and made available as required.

2.2.28. Eskom shall ensure that an integrated and coordinated emergency management system is established and maintained for nuclear and radiological emergencies.

2.2.29. Eskom shall ensure that radiation protection strategies are developed, justified and optimised at the planning stage, and that emergency response is undertaken through their timely implementation.

2.2.30. Eskom shall establish a programme for managing, controlling and recording the doses of emergency workers involved in a nuclear and/or radiological emergency.

2.2.31. Eskom shall ensure that arrangements are in place for implementation, as appropriate, for the transition from an emergency exposure situation to an existing exposure situation.

2.2.32. Eskom shall ensure that existing exposure situations that have been identified on Eskom premises are evaluated to determine which occupational exposures and public exposures are of concern from the point of view of radiation protection.

2.2.33. Eskom shall ensure that remedial actions and protective actions on Eskom premises are justified and that the protection and safety of people and the environment is optimised.

2.2.34. Eskom shall ensure that provision is made for identifying areas on Eskom premises with residual radioactive material, for establishing and implementing remediation programmes and post-remediation control measures, if appropriate, and for putting in place an appropriate strategy for radioactive waste management.

2.2.35. Exposure in the workplace

- a) Eskom shall establish and implement radiation protection requirements for the protection of workers in existing exposure situations.
- b) Eskom shall provide information on levels of radon in the workplace and the associated health risks and, if appropriate, shall establish and implement an action plan for controlling radon exposure in the workplace.

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30



### **3. Supporting Clauses**

The radiation protection principles and overarching rules addressed in this document is aligned to the commitment of the government of the Republic of South Africa and Eskom to ensure that radiation safety receives the highest priority to provide for the protection of persons, property and the environment.

#### **3.1 Scope**

##### **3.1.1 Purpose**

The purpose of the principles and overarching rules addressed in this Policy, when applied, are to:

- a) prevent the occurrence of deterministic effects in individuals employed at Eskom facilities by keeping doses below the relevant threshold;
- b) ensure that all reasonable steps are taken to reduce the occurrence of stochastic effects to as low as reasonable achievable in all employees occupationally exposed to radiation at Eskom facilities;
- c) ensure, by medical surveillance, that the health status of an employee does not pose a safety risk, and that exposure to radiation will not adversely affect the health of that individual; and
- d) protect Eskom property, employees, and the environment from harm by establishing and maintaining effective defence in depth including a medical surveillance and control programme, against radiological hazards from radioactive sources and to reduce the risk of exposure.

##### **3.1.2 Applicability**

This Policy shall apply throughout Eskom Holdings SOC Ltd divisions and subsidiaries where exposure to ionising radiation exists.

##### **3.1.3 Effective date**

The effective date will be the date when the document is authorised.

#### **3.2 Normative/Informative References**

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

##### **3.2.1 Normative**

- [1] Government regulation R.1302, Government Gazette 13299, 14 June 1991

#### **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- [2] Government regulation R.246, Government Gazette 14596, 26 February 1993
- [3] Government regulation R.388, Government Gazette 28755, 28 April 2006
- [4] Government regulation R740, Government Gazette 15648, 16 April 1994
- [5] IAEA GSR Part 3: Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, 2014
- [6] Nuclear Energy Policy and Strategy for the Republic of South Africa, 2008
- [7] Radioactive Waste Management Policy and Strategy for the Republic of South Africa, 2005
- [8] 32-83 Nuclear Management Policy.

### **3.2.2 Informative**

- [9] Disaster Management Act, 2002 (Act No.57 of 2002)
- [10] Hazardous Substances Act, 1973 (Act No.15 of 1973)
- [11] ICRP 103: 2007 Recommendations of the International Commission on Radiological Protection
- [12] ISO 9001 Quality Management Systems
- [13] National Nuclear Regulatory Act, 1999 (Act No.47 of 1999)
- [14] Nuclear Energy Act, 1999 (Act No.46 of 1999)

### **3.3 Definitions**

- 3.3.1 **Action:** Any human activity that introduces sources of exposure or exposure pathways, in addition to those of natural background radiation levels, 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 to people or the number of people exposed.
- 3.3.2 **Accident:** Any unintended event, including operating errors, equipment failures and other mishaps, the consequences or potential consequences of which are not negligible from the point of view of protection and safety.
- 3.3.3 **Activities:** includes: the production, use, import and export of radiation sources for industrial, the transport of radioactive material; the decommissioning of facilities; radioactive waste management activities such as the discharge of effluents; and some aspects of the remediation of sites affected by residues from past activities.
- 3.3.4 **Approved:** The granting of consent by a regulatory body.

#### **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd,  
Reg No 2002/015527/30

- 3.3.5 **Assessment:** The process and the result, of analysing systematically the hazards associated with sources and actions, and associated protection and safety measures, aimed at quantifying performance measures for comparison with criteria.
- 3.3.6 **Authorisation:** The granting by a regulatory body or other governmental body of written permission for a person or organisation to conduct specified activities.
- 3.3.7 **Clearance level:** A value established by a regulatory body and expressed in terms of activity concentration, at or below which regulatory control may be removed from a source of radiation within a notified or authorized action.
- 3.3.8 **Constraint:** A prospective and source related value of individual dose (dose constraint) or risk (risk constraint) that is used in planned exposure situations as a parameter for the optimisation of protection and safety for the source, and that serves as a boundary in defining the range of options in optimisation.
- 3.3.9 **Defence in depth:** The application of more than one protective measure for a given safety objective such that the objective is achieved even if one of the protective measures fails.
- 3.3.10 **Deterministic effect:** A health effect of radiation for which generally a threshold level of dose exists above which the severity of the effect is greater for a higher dose. The level of the threshold dose is characteristic of the particular health effect but may also depend to a limited extent, on the exposed individual.
- 3.3.11 **Detriment:** The total harm that would eventually be experienced by an exposed group and its descendants as a result of the group's exposure to radiation from a source.
- 3.3.12 **Dose:** A measure of the energy (radiation) received or absorbed by a target.
- 3.3.13 **Dose limit:** The value of the effective dose or the equivalent dose to individuals in planned exposure actions that is not to be exceeded.
- 3.3.14 **Emergency:** A non-routine situation that necessitates prompt action, primarily to mitigate a hazard or adverse consequences for human health and safety, quality of life, property or the environment. This includes nuclear or radiological emergencies and conventional emergencies such as fires, release of hazardous chemicals, storms or earthquakes. It includes situations for which prompt action is warranted to mitigate the effects of a perceived hazard
- 3.3.15 **Emergency exposure situation:** A situation of exposure that arises as a result of an accident, a malicious act or other unexpected event, and requires prompt action in order to avoid or reduce adverse consequences. i Emergency exposures can be reduced only by protective actions and other response actions.

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- 3.3.16 **Emergency preparedness:** The capability to take actions that will effectively mitigate the consequences of an emergency for human health and safety, quality of life, property and the environment.
- 3.3.17 **Emergency worker:** A person having specified duties as a worker in response to an emergency.
- 3.3.18 **Employee:** Any person who is employed by or works for an employer and who receives any remuneration, or who works under the direction or supervision of an employer or any other person.
- 3.3.19 **Employer:** Any person who employs or provides work for any person and remunerates that person or expressly or tacitly undertakes to remunerate him.
- 3.3.20 **Environment:** The conditions under which people, animals and plants live or develop and which sustain all life and development; especially such conditions as affected by human activities.
- 3.3.21 **Environmental monitoring:** The measurement of external dose rates due to sources in the environment or of radionuclide concentrations in environmental media.
- 3.3.22 **Eskom:** is used for Eskom Holdings SOC Ltd, its divisions and wholly owned subsidiaries.
- 3.3.23 **Exposure:** The state or condition of being subject to irradiation. External exposure is exposure to radiation from a source outside the body. Internal exposure is exposure to radiation from a source within the body.
- 3.3.24 **Facilities:** A general term encompassing facilities where sources of ionising radiation are used which may result in exposure to radiation.
- 3.3.25 **Ionising radiation:** Radiation capable of producing ion pairs in biological material(s).
- 3.3.26 **Intervention:** Any action intended to reduce or avert exposure to, or the likelihood of exposure to sources of radiation, which are not part of a controlled action or which are out of control as a consequence of an accident.
- 3.3.27 **Justification:** The process of determining for a planned exposure situation whether an action is, overall beneficial; i.e., whether the expected benefits to individuals and to society from introducing or continuing the actions outweigh the harm (including radiation detriment) resulting from the action.
- 3.3.28 **Management system:** A set of interrelated or interacting elements (the system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner.

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- 3.3.29 **Medical exposure:** Exposure incurred by patients for the purposes of medical or dental diagnosis or treatment; by carers and comforters; and by volunteers subject to exposure as part of a programme of biomedical research.
- 3.3.30 **Notification:** A document submitted to the regulatory body by a person or organisation to notify an intention to carry out an action or other use of a source.
- 3.3.31 **Optimisation:** The process of determining what level of protection and safety would result in the magnitude of individual doses, the number of individuals (workers and members of the public) subject to exposure and the likelihood of exposure being “as low as reasonably achievable, economic and social factors being taken into account” (ALARA).
- 3.3.32 **Occupational exposure:** All exposures of radiation to workers incurred in the course of their work.
- 3.3.33 **Planned exposure situation:** Is a situation of exposure that arises from the planned operation of a source or from a planned activity that results in an exposure from a source.
- 3.3.34 **Potential exposure:** Prospective exposure that is not expected to be delivered with certainty but that may result from an anticipated operational occurrence, accident at a source or owing to an event or sequence of events of a probabilistic nature, including equipment failures and operating errors.
- 3.3.35 **Public exposure:** Exposure incurred by members of the public due to sources in planned exposure situations, emergency exposure situations and existing exposure situations, excluding any occupational exposure or medical exposure.
- 3.3.36 **Protection and safety:** The protection of people at present and in the future against exposure to ionising radiation or radioactive substances and the safety of radiation sources, including the means for achieving such protection and safety, such as the various procedures and devices for keeping people’s doses and risks as low as reasonably achievable.
- 3.3.37 **Protection of the environment:** Includes the protection and conservation of non-human species, both animal and plant, and their biodiversity; environmental goods and services such as the production of food and feed; resources used in agriculture, forestry, fisheries and tourism; amenities used in spiritual, cultural and recreational activities; media such as soil, water and air; and natural processes such as carbon, nitrogen and water cycles.
- 3.3.38 **Radiation:** in this context means ionising radiation.
- 3.3.39 **Radiation generator:** A device capable of generating ionising radiation, such as X rays, neutrons, electrons or other charged particles, that may be used for scientific, industrial or medical purposes.

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

- 3.3.40 **Radiation risks:** Detrimental health effects of exposure to radiation (including the likelihood of such effects occurring).
- 3.3.41 **Radiation protection or radiological protection:** The protection of people, property and the environment from harmful effects of exposure to ionising radiation, and the means for achieving this.
- 3.3.42 **Radioactive:** Exhibiting radioactivity; emitting or relating to the emission of ionising radiation or particles.
- 3.3.43 **Radioactive material:** Material designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity.
- 3.3.44 **Radioactive source:** A source containing radioactive material that is used as a source of radiation.
- 3.3.45 **Radioactive waste:** Material for which no further use is foreseen that contains, or is contaminated with, radionuclides at activity concentrations or activities greater than clearance levels as established by the regulatory body.
- 3.3.46 **Radon:** Any combination of isotopes of the element radon-220 and radon-222.
- 3.3.47 **Regulatory body:** An authority or a system of authorities designated by the government of a State as having legal authority for conducting the regulatory process, including issuing authorizations, and thereby regulating nuclear, radiation, radioactive waste and transport safety i.e. the National Nuclear Regulator, the Directorate: Radiation Control, Department of Health.
- 3.3.48 **Risk:** A multi-attribute quantity expressing hazard, danger or chance of harmful or injurious consequences associated with exposures or potential exposures. It relates to quantities such as the probability that specific deleterious consequences may arise and the magnitude and character of such consequences.
- 3.3.49 **Safety assessment:** Assessment of all aspects of a practice that are relevant to protection and safety; for an authorized facility, this includes siting, design and operation of the facility.
- 3.3.50 **Safety culture:** The assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance.
- 3.3.51 **Source:** Anything that may cause radiation exposure, by emitting ionising radiation or releasing radioactive substances or materials.

**CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30



3.3.52 **Stochastic effects:** A health effect, the probability of occurrence of which is greater for a higher radiation dose and the severity of which (if it occurs) is independent of dose and generally occurs without a threshold.

3.3.53 **Worker:** Any person who works, whether full time, part time or temporarily, for an employer and who has recognized rights and duties in relation to occupational radiation protection.

3.3.54 **Workers' health surveillance:** Medical supervision intended to ensure the initial and continuing fitness of workers for their intended tasks.

3.3.55 **Workplace monitoring:** Monitoring using measurements made in the working environment

### 3.4 Abbreviations

Abbreviation	Explanation
ALARA	As Low As Reasonably Achievable
ESKOM	ESKOM Holdings SOC Ltd, its divisions and wholly owned subsidiaries
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection

### 3.5 Roles and Responsibilities

3.5.1 The Divisional Executive: Chief Nuclear Officer has the overall accountability and responsibility for the monitoring of this Policy and for providing expert support in radiation protection when needed.

3.5.2 Eskom Divisions, Departments and Groups have the accountability and responsibility for compliance with this Policy where applicable.

### 3.6 Process for Monitoring

Eskom has an established nuclear safety governance committee structure, with the various committees reporting to various levels of the organisation to advise business on radiation safety matters,

#### **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd, Reg No 2002/015527/30

3.6.1 Nuclear Safety Review Committee (NSRC)

3.6.2 Nuclear Management Committee (NMC)

3.6.3 Eskom internal audit will conduct regular audits to ensure compliance with this Policy.

#### **4. Authorization**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>
EXCO-NMC	Accepted at NMC meeting of 10 September 2021

#### **5. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Remarks</b>
August 2021	3	Policy updated due to review cycle. No changes were made to the fundamental safety principles addressed in revision 2 of the document. However, NNR recommendations on references and definitions were incorporated.
July 2018	2	Policy updated due to review cycle. No changes were made to the fundamental safety principles addressed in revision 1 of the document.
January 2015	1	Policy was updated because of 3 year review cycle.
January 2007	0	New Policy

#### **6. Development Team**

The following people were involved in the development of this document:

- Koeberg Radiation Protection Manager
- Koeberg Emergency Management Manager
- Eskom Radiation Protection Officers
- Eskom Radiation Protection Controllers
- Nuclear Safety Assurance
- Koeberg Senior Authorised Persons
- M Maree
- MV Moduka

#### **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd,  
Reg No 2002/015527/30

- K Featherstone

## **7. Acknowledgements**

Not applicable

### **CONTROLLED DISCLOSURE**

When downloaded from the document management system, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the system.

No part of this document may be reproduced without the expressed consent of the copyright holder, Eskom Holdings SOC Ltd,  
Reg No 2002/015527/30