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NNR: NO No.:	MANAGEMENT OF THE SOLID RADIOACTIVE WASTE PROGRAMME			PAGE 1

KORC	ACCESS	IMPORTANCE CATEGORY	NEXT REVIEW DATE	DATE AUTHORISED
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(sgd) U PHILANDER	(sgd) T KARSTEN	(sgd) R BAKARDIEN
U PHILANDER	T KARSTEN	R BAKARDIEN
SENIOR TECHNICIAN	RADIATION PROTECTION MANAGER	KORC CHAIRMAN
DATE 2021-07-13	**DATE** 2021-07-13	**DATE** 2021-07-13

THIS STANDARD HAS BEEN SEEN AND ACCEPTED BY:

U Philander	Document Custodian
M Minnaar	Senior Advisor (Radiation Protection)
C le Roux	Senior Supervisor Technical (Radwaste)

FCA	ALARA REVIEW	SUPERSEDES
PROTECTION	NO	KSA-048, Rev 3a dd. 2020-03-31 FULL REVIEW

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1.0 PURPOSE

1.1 To define the requirements for the management of solid radioactive waste to ensure an acceptable level of protection for employees, the public and the environment.

2.0 SCOPE

2.1 Applicable to all Koeberg activities or practices, which either generate, treat, or handle radioactive waste.

3.0 DEFINITIONS & ABBREVIATIONS

3.1 Definitions

3.1.1 **Collection of Waste** – Different types of waste gathered, stacked or stored in designated areas. Reference to KAA-634.

3.1.2 **Conditioning** – Those operations that produce a waste package suitable for handling, transportation, 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, provision of an over pack.

3.1.3 **Data Pack** – The collection of information required for the waste, e.g. material certificates, test results, analysis reports and inspection reports required for either for storage or disposal at the Disposal Facility – Vaalputs.

3.1.4 **Determination** – A method of calculation to specify the radioactivity or contamination of the material or waste.

3.1.5 **Disposal Facility** – The National Radioactive Waste Disposal Facility at Vaalputs who are authorised to receive, handle and/or dispose of radioactive waste.

3.1.6 **Intermediate Storage Area** – This is a storage area on plant where radioactive waste is stored prior to final disposal.

3.1.7 **Non-compactable Waste (NCW)** – Waste that cannot be compressed but can be treated by other means and conditioned for regulated disposal at Vaalputs .

3.1.8 **Non-Conforming Containers** – Any type of container not conforming to the Vaalputs – Waste Acceptance Criteria, is considered to be a non-conforming container.

3.1.9 **Non-Process Generated Waste** – This is seen as project generated waste such as reactor components and auxiliary equipment that is taken out of service.

3.1.10 **Process Generated Waste** – Waste generated when the power station is in normal operation and includes resins, filters from process systems, evaporator concentrates, non-compactable waste, compactable trash and sludge from decontamination activities.

3.1.11 **Processing** – Any operation that changes the characteristics of the waste, including waste pre-treatment, treatment and conditioning.

3.1.12 **Radwaste Shipping Documents** – Forms required for the off-site shipment of solid radioactive material or waste.

3.1.13 **Segregation** – Separating the different types of waste and storing in designated areas. This forms part of the pre-treatment operations.

3.1.14 **Standard Containers** – 6300 kg concrete and 210 litre steel containers are currently considered to be standard waste containers in accordance with the Vaalputs Waste Acceptance Criteria.

3.1.15 **Waiver** – Permission applied from the disposal facility for the transport of a radioactive waste shipment that does not conform to the disposal facility Waste Acceptance Criteria.

3.1.16 **Waste Classification** – A method used to group various types of radioactive wastes according to their radiological characteristics.

3.1.17 **Waste Type** – Waste from a specific waste stream collected on the basis of similar radiological and physical properties.

3.2 Abbreviations

3.2.1 **ALARA** – As Low As Reasonably Achievable

3.2.2 **GS & A** – Generation Safety & Assurance Department

3.2.3 **IAEA** – International Atomic Energy Agency

3.2.4 **LLW** – Low Level Waste

3.2.5 **NRWDI** – National Radioactive Waste Disposal Institute

3.2.6 **NCRWM** – National Committee on Radioactive Waste Management

3.2.7 **NCW** – Non Compactible Waste

3.2.8 **NECSA** – South African Nuclear Energy Corporation

3.2.9 **NNR** – National Nuclear Regulator

3.2.10 **RP** – Radiation Protection

3.2.11 **RPC** – Radiation Protection Certificate

3.2.12 **TD & RM** – Technical Documentation & Records Management

3.2.13 **WAC** – Waste Acceptance Criteria

4.0 REFERENCES

4.1 Reference Documents

4.1.1 240-4113228853, Rev 0: Solid Radioactive Management Plan for Koeberg Nuclear Power Station

4.1.2 332-5, Rev 5: Koeberg Nuclear Power Station Management Manual

4.1.3 KAA-500, Rev 13: The Process for Controlled Documents

4.1.4 KSA-011, Rev 14: The Requirements for Controlled Documents

4.1.5 KWH-AL-004, Rev 14: Radiation Protection Formal ALARA Programme Criteria, Actions and Documentation

4.1.6 NIL-01: Nuclear Installation Licence

4.2 Applicable Documents

4.2.1 238-51: Radioactive Waste Management

4.2.2 238-54: Radiological Protection Licensing Requirements for Koeberg Nuclear Power Station

4.2.3 Department of Minerals and Energy: Radioactive Waste Management Policy and Strategy for the Republic of South Africa

4.2.4 IAEA: Regulations for the Safe Transport of Radioactive Materials

4.2.5 KAA-634: Responsibilities for the Radioactive Material and Radioactive Waste Control Programme

4.2.6 KGA-086: Guide for the Non Standard Waste Tracking Program and Register

4.2.9 VLP-WAC-001: Waste Acceptance Criteria for Disposal at Vaalputs Repository

5.0 REQUIREMENTS

5.1 Identification of Radioactive Waste

5.1.1 All waste identified shall be subject to the prescribed Koeberg radiological surveillance methods.

5.1.2 Due to the ALARA impact, all radioactive waste shall be clearly labelled for identification.

5.2 Determination of the Radioactivity Content

5.2.1 A programme for the determination of radioactive content of radioactive waste shall be implemented. This programme shall be in line with the applicable IAEA transportation regulations, the disposal facility waste acceptance criteria and approved by the NNR.

5.3 Classification of Radioactive Waste

5.3.1 Solid radioactive waste shall be classified in accordance with 238-51.

5.4 Processing and Conditioning of Radioactive Waste

5.4.1 Solid radioactive waste shall be processed and conditioned in accordance with 238-51.

5.4.2 The appropriate conditioning must ensure that the radioactive waste complies with the packaging requirements relevant to IAEA transport regulations, the disposal facility's waste acceptance criteria and any other regulatory requirements.

5.5 Storage and Accounting

5.5.1 Designated permanent and intermediate storage areas shall be identified for storage of radioactive waste for all waste classes.

5.5.2 Routine surveillance programmes shall be implemented at these storage areas.

5.5.3 Storage areas shall be clearly demarcated and signposted.

5.5.4 A radioactive waste inventory programme shall be implemented for the traceability and control of solid radioactive waste on the station. See Appendix 1 for the requirements that must be met before Radwaste Management will accept radioactive waste.

5.5.5 No container made or constructed from cardboard or wood shall be accepted for disposal or stored at the Low Level Waste storage area.

5.5.6 All radioactive waste stored in the controlled zones shall be subjected to the identification and storage requirements of the station.

5.5.7 All radioactive waste stored in the controlled zones shall be subjected to the identification and storage requirements of the station.

5.5.7.1 An inventory database shall account for the waste stored in designated storage areas.

5.5.7.2 An inventory database shall include, as far as possible, NAB ventilation filters and non-process waste stored in the LLW Building.

5.6 Transport and Disposal

5.6.1 Radioactive waste shall be packaged, labelled and transported in accordance with the relevant IAEA transport requirements.

5.6.2 All shipment packages shall comply with the disposal facility's waste acceptance criteria. In the event that a shipment package does not comply a waiver shall be applied for the non-compliance for approval by the NNR and the disposal facility.

5.6.3 The disposal facility shall be formally notified in advance regarding shipments in accordance with the waste acceptance criteria.

5.7 Administrative Requirements

5.7.1 Procedures

5.7.1.1 Written procedures shall be in place for activities involving handling, storage and transportation of radioactive waste.

5.7.2 Records and Reports

5.7.2.1 The documentation pertaining to the radioactive waste and test results, and checks and inspections carried out on the waste for disposal at Vaalputs shall be kept in TD&RM as quality records.

5.7.2.1 A quarterly report shall be submitted to the regulatory authority. This report shall include the following:

5.7.2.1.1 Source and quantity of effluent, resins and filters produced during the year.

Concentrates

Identify each batch of concentrate dispatched to the concentrate storage tank by system/sub-system of origin as follows:

- TEP
- TEU – Process drains

  Floor drains

  Service Effluent

  Chemical Effluent

Resins

Identify each resin change by Unit, system and instrumentation designation i.e., 1 RCV 001 DE, 2 RCV 003 DE etc.

Filters

Identify each filter change by Unit, system and instrumentation designation i.e., 1 RCV 001 FI etc.

5.7.2.1.2 Quantity of waste drummed during the year

Specify the number of concrete and steel drums produced and the type of drum

5.7.2.1.3 Number and type of drums and activity of each waste category shipped to Vaalputs during the year

Specify the number of concrete and steel drums, type of drum, and isotopic activities shipped in each waste type

5.7.2.1.4 Inventory of waste at the close of the year

Specify the inventory in terms of number and type of concrete and steel drums for each waste type in the LLW Building and the NAB.

6.0 ATTACHMENTS

Appendix 1 – Koeberg Waste Acceptance Criteria

Appendix 2 – Verification of Compliance to Vaalputs Criteria

Appendix 3 – Justification

APPENDIX 1

KOEBERG WASTE ACCEPTANCE CRITERIA

1 Non-Process Generated Radioactive Waste

1) Non-process generated waste will need to be negotiated in the planning phase with radwaste Management to ascertain the projected inventory, waste minimisation techniques and costing.

2) Operating Shift, Chemistry, RP, Radwaste Management and any other group involved in the generation of radioactive waste on site shall raise the necessary notifications regarding all non-process generated waste to be conditioned or changed out as required.

3) Each process for the treatment and/or conditioning of radioactive waste shall be documented before commencement of the project or activity. Radwaste Management shall concur with the waste treatment plan.

4) The cost for the handling, treatment, approval and disposal of project generated waste shall be included in the project budget and shall be projected under the cost code.

5) Storage of non-process generated radioactive waste in the LLW building requires approval from the RP Manager in writing.

6) The project will ensure that the necessary approvals are obtained to allow for the transport and disposal of project generated waste if the waste is packaged in a non-standard package

7) The approvals for waste package include:

- A Radwaste Plan (in accordance with the Radioactive Waste Management Policy and Strategy for the Republic of South Africa) for review by NRWDI, recommendation by the NCRWM and approval by the Minister of Energy.

- A safety submission for transport and disposal for approval by the NNR

APPENDIX 2

VERIFICATION OF COMPLIANCE TO VAALPUTS CRITERIA

1 Shipment verification Prior to Transport and Disposal

1) Approval of each shipment or consignment is granted on verification of the waste acceptance criteria according to the documents submitted by the waste generator before delivery to Vaalputs, and confirmed once all the originals documents are delivered with the consignment.

2) Before waste shipments leave the site, the proper signage and surveys shall be performed to ensure that the consignment complies with IAEA, Vaalputs, Eskom and Koeberg waste transportation requirements.

APPENDIX 3

JUSTIFICATION

Revision 2

1. Full review due.

2. Procedure updated to reflect current Radwaste Management functions.

Revision 3

1. Full review due.

2. GGS 1316 is superseded by 238-51.

3. GGS 1330 is superseded by 238-54.

4. Aligned definitions to Solid Radioactive Management Plan for Koeberg Nuclear Power Station.

   Safety Screening S2017-304

Revision 3a
Page/Section

1. Page 9, para 5.7.3.2 (3): Requirement “The number of drums stored in LLW, steel and concrete drums” amended to provide clarity as to what information is supplied to the National Nuclear Regulator on a quarterly basis.

   Safety Screening S10449

Revision 4

1. Full review to document current Koeberg waste management practices.

   Safety Screening S11687