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DATE 2022-05-26	**DATE** 2022-05-26	**DATE** 2022-05-26

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FCA	ALARA REVIEW	SUPERSEDES
PROTECTION	YES 2022-05-10	KSH-011, Rev 10 dd. 2019-04-08 FULL REVIEW

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1.0 PURPOSE

1.1 To describe the requirements of the Radiation Protection Certificate (RPC) programme.

2.0 SCOPE

2.1 Applicable to all station staff specifically authorised to initiate, authorise, and ensure application of the Radiation Protection Certificate (RPC) Programme.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

3.1.1 **ALARA Co-ordinator** – This person is appointed by the Manager (Radiation Protection) to administer the Station ALARA programme.

3.1.2 **ALARA SRPA** – A person designated to review all planned/emergent/urgent work within the radiologically controlled zone, prepare and issue RPCs, or ensure that RPCs are issued for work.

3.1.3 **Authorise an RPC** – In terms of this procedure, the term “Authorise” implies that the draft RPC has been reviewed, is deemed appropriate and is formalised by it being authorised on the RADPRO system, or by the signing of a manually generated RPC by an Authorised / Senior Authorised Person (RP).

3.1.4 **Authorised Person [Radiation Protection (AP (RP)]** – A member of the Station Radiation Protection Group who has been authorised in writing by the Power Station Manager to issue Radiation Protection Certificates. In this procedure, such a person will be referred to as an AP (RP).

3.1.5 **General/Standing RPC** – This is an RPC on which many different activities can be performed, it is usually for the use of a group, or many groups where the workscope is similar and the protection requirements are similar. It can be defined for outage or online work.

3.1.6 **Issue RPC** – In terms of this procedure, the term “Issue” implies the formal assigning of an RPC number to a Work Order or PTW.

3.1.7 **Radiation Protection Certificate (RPC)** – A document issued by an Authorised Person (RP) or SAP (RP) that summarises the radiological conditions in an area as well as specifying the radiological precautions necessary to perform an activity.

3.1.8 **RP Representative** – A Radiation Protection Monitor, or higher designation.

3.1.9 **Senior Authorised Person (Radiation Protection) [SAP (RP)]** – A person who has been authorised in writing by the Power Station Manager to act as, or on behalf of the Manager (Radiation Protection). In this procedure such a person will be referred to as an SAP (RP).

3.1.10 **Specific RPC** – An RPC that has been generated for a specific activity or task for a defined period.

3.2 Abbreviations

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

3.2.2 **AP (RP)** – Authorised Person (Radiation Protection)

3.2.3 **CR** – Condition Report

3.2.4 **NAL** – Novell Application Launcher

3.2.5 **OE** – Operating Experience

3.2.6 **PTW** – Permit to Work

3.2.7 **RADPRO** – Radiation Protection Information System

3.2.8 **RP** – Radiation Protection

3.2.9 **RPA** – Radiation Protection Assistant

3.2.10 **RPC** – Radiation Protection Certificate

3.2.11 **RPOO** – Radiation Protection Operations Office

3.2.12 **SAP** – System Application Products (Materials Management Computer System)

3.2.13 **SAP (RP)** – Senior Authorised Person (Radiation Protection)

3.2.14 **SRPA** – Senior Radiation Protection Assistant

3.2.15 **TA** – Test Application

4.0 REFERENCES

4.1 Referenced Documents

4.1.1 238-34, Rev 0b: Optimisation of Radiation Protection

4.1.2 238-54, Rev 0b: Radiological Protection Licensing Requirements for Koeberg Nuclear Power Station

4.1.3 335-2, Rev 5: Koeberg Nuclear Power Station Management Manual

4.1.4 KAA-500, Rev 13 The Process for Controlled Documents

4.1.5 KAA-632, Rev 11: ALARA Programme

4.1.6 KAA-667, Rev 7c: Processing a Permit to Work

4.1.7 KGH-001, Rev 6: Preparation and Issue of RPCs using the New RADPRO RPC Computerised System

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

4.1.9 KSA-049, Rev 10: Koeberg Training Standard

4.1.10 KWH-S-001, Rev 20: Radiation and Surface Contamination Surveys

4.1.11 KWH-S-021, Rev 27: Access Control

4.2 Applicable Documents

4.2.1 KAA-688: The Corrective Action Process

4.2.2 KFH-AL-021: Pre-job Survey Checklist

4.2.3 KSH-008: Radiation Protection Records, Data and Information Management

4.2.4 KWH-AL-004: Radiation Protection Formal ALARA Programme Criteria, Actions and Documentation

5.0 REQUIREMENTS

5.1 General

5.1.1 The present SAP Work Order system is the primary mechanism used to identify all planned work in radiological controlled zones that may require RP input or an RPC. This system is reviewed by the ALARA AP (RP). The appropriate RPC number is added to the Order and PTW, or as a minimum, it must be indicated whether an RPC is required. In the absence of the ALARA AP (RP), the Shift AP (RP) must review the PTW system and enter the RPC requirements.

5.1.3 Only an Authorised Person (RP) or Senior Authorised Person (RP) shall authorise and issue an RPC.

5.1.3 Standing RPCs must be reviewed by an AP (RP) as dictated by the latest plant conditions and/or work practices.

5.1.4 It is important to note that an RPC does not provide any authority to carry out a task. Their sole objective is to specify the radiological safety requirements that must be met (see Eskom Plant Safety Regulations).

5.1.5 The job supervisor shall maintain the number of individuals required to perform a given task to an optimum number to minimise collective dose and ensure dose distribution amongst workers.

5.1.6 Depending on the plant status, radiological conditions (actual or anticipated), and the nature of the task to be performed, radiological surveys, most recently completed should be considered to determine the RPC requirements. Radiological History may also be used. This is applicable for RP dose level 1 and 2 jobs as specified in KWH-AL-004.

5.1.7 For RP dose level 3 and 4 jobs, a pre-job survey must be performed in the actual work areas to obtain accurate radiological data, when practical.

5.1.8 ALARA staff to provide the person who will perform the pre-job survey with as much information as possible i.e. plant trigram, location of component/s, maps, drawings, if available, and a brief description of work including support activities that will be performed. Where practical, this must be used in conjunction with the Pre-job survey checklist (KFH-AL-021).

5.1.9 To ensure that Standing RPCs remain valid, a survey of the accessible areas in the Controlled Zones shall be carried out at a set frequency as specified by the Radiation Protection Manager. This is to verify that the radiological and working conditions have not changed. Surveys are to be completed with ALARA in mind, and therefore, RP Locked Zones, Red Zones and RP Areas not routinely surveyed need only be surveyed when entry is required.

5.1.10 Should RP personnel be aware of any zone classification change, including Locked Zones, due to a change or expected change in radiological conditions, all relevant RPCs must be reviewed to ensure that they are still valid for entry and work.

5.1.11 If the RPCs are no longer valid due to change in radiological conditions, all relevant RPCs must be revised and all staff involved briefed.

5.1.12 Workers shall have a copy of the specific RPC in the Work Package.

5.1.13 Specific RPCs issued for work on active components or materials shall only be valid for the duration of the job or specific activity.

5.1.14 RPCs are required for **all** entries into controlled zones.

5.1.15 When an RPC is initiated, either from scratch, or copying a previously used RPC, it is imperative that all statements in the various criteria are reviewed. The statements must be relevant to the work defined in the description of the RPC. The compilation of an RPC should be a cognitive process.

5.1.16 The ALARA AP (RP) shall review the SAP / PTW systems daily and prepare and issue RPCs where appropriate (see KWH-AL-004).

5.1.17 If a task requires a particular type and frequency of survey, it shall be prescribed on the RPC.

5.1.18 A Week Plan shall be prepared as detailed in KWH-AL-004.

5.1.19 Job classification is to be carried out to ensure continuous focus on ALARA dose optimisation.

5.1.20 The Shift SRPA to review the latest RPC listing daily and ensure the latest revisions are filed at the NAB control zone access control point. The day shift SRPA to perform the same reviews for satellite control zones access control points.

5.2 Minimum Requirements of an RPC

NOTE: *In the event of the RADPRO computer system being unavailable, a manual RPC may be created. The RADPRO system must be updated as soon as it becomes available.*

5.2.1 The following requirements shall be included on the RPC, as a minimum:

(1) A description of the work to be performed.

(2) RP dose level.

(3) High risk if applicable as defined by KWH-AL-004.

(4) Anticipated/expected Radiological conditions (radiation, surface contamination and airborne contamination) in controlled zone work areas.

(5) Protective clothing, dosimetry, and respiratory protection requirements (where applicable) for the work.

(6) EPD dose and dose rate alarm settings.

(7) Specific instructions for the personnel who are to perform the work.

(8) RP surveillance requirements.

(9) Where applicable, international and/or Koeberg specific Operating Experience should be considered during the Work Order review and RPC preparation process.

(10) Total estimated dose.

(11) Work stop criteria where applicable.

(12) Hold points where applicable.

(13) Specific contamination reduction techniques where applicable.

(14) Escape criteria (only applicable to High risk activities).

5.3 Work Stop Criteria

5.3.1 Work stop criteria must be included on all RPCs.

5.3.2 The criteria to be considered are:

(1) Actual dose rate exceeds general area dose rate on RPC by 20%.

(2) Contamination level is likely to exceed current contamination zone classification.

(3) Airborne concentration: delete the criteria which is not applicable.

If no respiratory protection is required, include statement: Airborne contamination > 37 Bq/m^3 (Respirator required). If a particular respirator is used, include statement: Airborne contamination > 1850 Bq/m^3 (Air suit required). If air suit is already prescribed, place nothing.

(4) Workscope changes (stop job when workscope changes).

5.4 Radiation Protection Authority to Issue a "Work Stop Order"

5.4.1 Radiation Protection representatives may, for a valid reason, order activities that are judged to adversely affect radiological safety to be stopped. (This could result in a revision of the appropriate RPC).

5.4.2 When a job is stopped, the duty SRPA / AP (RP) shall be notified and, if appropriate, **suspend** the RPC. A CR must be raised.

5.4.3 Following a Work Stop Order, the Authorised Person (RP) shall notify the job supervisor and the Duty Work Controller. A Senior Authorised Person (RP) and the Radiation Protection Manager shall also be informed as soon as practical.

5.5 RPC Authorisation Process

5.5.1 For all high risk tasks and work performed in a Red Zone, an ALARA review shall be performed and a Senior Authorised Person (RP) shall be informed by the AP (RP) who has prepared the RPC. The SAP shall then authorise the RPC.

5.5.2 If the job supervisor does not agree with the conditions set out in the RPC, he/she may refuse to accept the implementation of the PTW. Under these circumstances, the job supervisor shall consult an Authorised Person (RP) and attempt to resolve the problem. Failing a resolution, a Senior Authorised Person (RP) shall be consulted to give final judgement. It is essential that the problem is resolved as activities within the controlled zones cannot be authorised until the radiological precautions have been agreed to by the job supervisor.

5.5.3 A person other than the RPC compiler / reviser must authorise the RPC. This provides a level of independent review to the process.

5.5.4 In the event of an emergency, to ensure that plant safeguards are not compromised, the Operating Shift Manager has the authority to override the RPC process requirements, in which case a CR shall be raised. (Refer to procedure KAA-688). The Duty SRPA shall, however, specify the radiological protection requirements.

5.6 Upgrading and Downgrading RPC's

5.6.1 Before work is started, the RP representative providing coverage for the job shall validate the actual radiological conditions versus those defined in the RPC. IF the RP representative identifies that the radiological conditions have changed, such that the requirements of the RPC are no longer applicable, the RPC shall need to be upgraded or downgraded.

5.6.2 All RPCs must be reviewed to ensure that radiological protection requirements are met.

5.6.3 If RPCs are no longer valid due to change in radiological conditions, all affected RPCs must be revised. The old copy of the RPCs must be removed from the RPC file, the Job Supervisor must be informed of the changes and staff to be briefed on the changes.

5.6.4 Upgrading an RPC

5.6.4.1 Normally, the RPC requirements are conservative to ensure that adequate protection is provided. If, during the pre-job survey and job coverage, the radiological conditions are found to be more restrictive than was anticipated, the RPC shall be upgraded.

5.6.4.2 Prerequisites for Upgrading an RPC:

(1) The work shall be suspended, and the Duty SRPA / AP (RP) shall be informed.

(2) Based on the observed radiological conditions, the RPC shall be either temporarily changed or permanently revised. It may even be necessary for a formal ALARA pre-job review to be performed.

(3) If temporarily changed, the SRPA to write changes on RPC only and inform workers and make a log entry.

(4) If the revision is to be permanent, revise the RPC on RADPRO, inform the Group concerned and arrange an additional ALARA pre-job briefing if applicable.

5.6.5 Downgrading an RPC

5.6.5.1 Based on the radiological conditions determined during the pre-job survey, the RPC requirements shall be downgraded at the discretion of the qualified RP Monitor at the job site, with SRPA approval.

5.6.5.2 Prerequisites for Downgrading an RPC:

(1) A pre-job survey (radiation and contamination) shall be performed and documented.

(2) There should be no risk of the radiological conditions changing (increasing) while the work is in progress.

(3) The workers shall be informed of the change in conditions and RPC requirements. The workers should agree with the decision to downgrade the RPC.

5.6.5.3 Process for Downgrading an RPC:

(1) The Radiation Protection representative at the job site, together with the SRPA, determines which changes to the RPC are required.

(2) The Duty SRPA or AP (RP) shall be informed of the changes and the reasons therefor. These changes must be approved in conjunction with the job supervisor.

(3) The Radiation Protection representative writes the changes on the copy of the RPC that the workers should have at the work site. Once the workers / job supervisor is informed, the work may recommence.

(4) RPC requirements included as OE must not be downgraded.

(5) The RPC on RADPRO must be updated.

5.7 Criteria for the Application of a Specific RPC

5.7.1 The creation of specific RPC's is determined by the RP dose level as defined in KWH-AL-004. Additionally, the following will require a specific RPC:

- Once detected, alpha smearable contamination exceeding 0,37 Bq/cm^2.
- Hot particle contamination present or to be expected.

5.7.2 When the contact dose rate on a component or any equipment is greater than or equal to 50 mSv/h, stay times must be calculated for the use of extremities to prevent extremity dose of an individual from being exceeded. This statement must be indicated on the RPC.

NOTE 1: In terms of this procedure, the General RPCs created for outage activities are NOT regarded as Standing RPCs.

NOTE 2: A standing emergency entry RPC may be created to include Red Zone entry.

5.8 Operating Experience

5.8.1 During the preparation of RPCs, OE shall be used as part of the radiological risk assessment. The Library of Learning on NAL, the OE file in RPOO or the Electronic data base should be used for this purpose. The appropriate OE identified, and their recommendations shall either be incorporated into the RPC requirements or should be addressed as part of the ALARA pre-job briefing.

5.9 ALARA Pre-job Briefing

5.9.1 The requirement for an ALARA pre-job briefing shall be indicated on the RPC and must be performed by an RPA or SRPA, together with the staff that is to be involved with the activity. If the ALARA pre-job briefing field is ticked (✓), it is then mandatory that a briefing be performed and documented. The RPC requirements shall be addressed during the briefing.

5.9.2 The criteria for when ALARA pre-job briefings shall be performed are defined in KWH-AL-004.

5.10 Acknowledgement of RPC Requirements by the Workers

5.10.1 Workers shall acknowledge that they have read and understood the requirements of the RPC and if applicable, the ALARA pre-job briefing, prior to entering the controlled zone.

5.11 Suspension of an RPC

5.11.1 An AP (RP) is authorised to “Suspend” and “Unsuspend” an RPC. This should be done if, at the discretion of the AP (RP), any further work on the RPC would compromise radiological safety. The reason for the suspension must be indicated in the relevant fields on the RADPRO system.

***NOTE**: A red zone RPC can only be unsuspended by an SAP (RP).*

5.12 Termination of an RPC

5.12.1 An RPC shall be terminated once all the work surrounding an activity has been completed, including the post job brief, if required. The RPC shall be cancelled on the RADPRO system.

5.13 Records

5.13.1 The following records generated will be maintained in accordance with KSH-008.

- RPCs generated on RADPRO are permanent records.
- KFH-AL-021, Pre-job Survey Checklist, is a non-permanent record.

6.0 ATTACHMENTS

Appendix 1 – Justification

APPENDIX 1

JUSTIFICATION

Revision 10

1. Full review.

Revision 11

1. Full review