Eskom	WORKING PROCEDURE	Allocation Centre 38A	Reference Number KWH-S-048	Rev 4
NNR: NO No.:	SIGNPOSTING AND BARRICADING IN RADIOLOGICAL CONTROLLED ZONES			PAGE 1

KORC	ACCESS	IMPORTANCE CATEGORY	NEXT REVIEW DATE	DATE AUTHORISED
NO	Nuclear Restricted	NSA	2024-02-27	2019-02-27

COMPILED / REVISED	REVIEWED	AUTHORISED
(Sgd) T MAKGALATIBA	(Sgd) I HUISAMEN	(Sgd) T KARSTEN
T MAKGALATIBA	I HUISAMEN	T KARSTEN
SENIOR RADIATION PROTECTION ASSISTANT	SENIOR SUPERVISOR RADIATION PROTECTION	RADIATION PROTECTION MANAGER
DATE 2019-02-26	**DATE** 2019-02-26	**DATE** 2019-02-27

THIS PROCEDURE HAS BEEN SEEN AND ACCEPTED BY:

D de Villiers	Document Custodian
P Groenewald	ALARA Co-ordinator
N Mokoto	Senior Licensing Physicist RP
R Trimm	Head of RP Training
H van Coller	Senior Supervisor RP (Acting)
B de Waal	Senior Supervisor RP
W Kleinsmidt	Senior RP Assistant
C Nieuwoudt	Senior RP Assistant (Acting)
C Adonis	Senior RP Assistant

CATEGORY 3 – PROCEDURE FOR REFERENCE

FCA	ALARA REVIEW	SUPERSEDES
PROTECTION	YES 2019-01-29	KWH-S-048, Rev 3 dd. 2016-02-23 FULL REVIEW

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1.0 PURPOSE

1.1 Provides uniform guidelines for establishing, posting, and maintaining Radiologically Controlled Zones at KNPS.

1.2 To describe demarcation and posting radiation and surface contamination areas inside radiological controlled zones.

1.3 To describe how hot particle zones are detected, established and posted.

NOTE 1: *Radiological controlled areas consist of radiation zones and contamination zones, i.e. surface and/or airborne contamination.*

NOTE 2: *Radioactive storage areas may consist of radiation and/or contamination zones.*

2.0 SCOPE

2.1 Applicable to all signposting and barricading in radiological controlled zones at Koeberg Nuclear Power Station.

2.2 Applicable to the demarcation and posting of radiation, surface contamination and hot particle zones at Koeberg Nuclear Power Station.

2.3 Applicable to all radiation, surface contamination and hot particle surveys performed on-site at Koeberg Nuclear Power Station.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

3.1.1 **Accessible Hot Spots** – Hot Spots that are easily accessible due either to their location or the absence of specific RP access controls. This includes Hot Spots that are accessible due to the placement of scaffolding, ladders, shielding, etc. and Hot Spots that have an effect on the normally accessible general area dose rate.

3.1.2 **ALARA** – Acronym for “As Low as Reasonably Achievable”, a basic concept of radiation protection that specifies that radioactive discharges from nuclear plants and radiation exposure to personnel be kept as low as reasonably achievable.

3.1.3 **Barricade** – A conspicuous obstacle, such as a firmly secured rope or ribbon (by itself or used with physical barriers such as existing walls or handrails), that completely surrounds an area and obstructs inadvertent entry.

3.1.4 **Becquerel** – The SI unit for radioactivity equal to one transformation per second.

3.1.5 **Boundary** – An established line beyond which exposure to radiation and/or radioactive material would occur, e.g., contaminated area rope, radiation tape, stanchion with a posting, or a step off pad.

3.1.6 **Conspicuous** – Obvious to the eye or mind.

3.1.7 **Demarcated Area** – An area within the Controlled Zone posted in accordance with procedure for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

3.1.8 **Hot Particle** – A metallic particle measuring from a few millimetres to less than 1 mm, with an activity of at least 3700 Bq (measuring about 20 000 cpm with L-177 pancake probe, or about 400 cps).

3.1.9 **Hot Particle Zone** – An area where hot particles have been confirmed to be present. The incidence of isolated hot particles will not necessarily require a hot particle zone to be established.

3.1.10 **Hot Spot** – A localised area or component having an unshielded contact doserate greater than or equal to 1 mSv/h AND having an unshielded contact doserate greater than five times the general area doserate at 50 cm from that localised area or component.

3.1.11 **Inaccessible Hot Spots** – Hot Spots that do not affect the normally accessible ambient dose rate for an area. These Hot Spots will, for example, be located behind grating, above 2 metres and when there are no means that give access to them (e.g. barricaded, in RP locked or red zones).

3.1.12 **Permanent Barrier** – A barrier and signposting used by RP to control access to radiation and/or contamination areas while the RP person is not in attendance.

3.1.13 **Radiological Controlled Zones** – Restricted, discrete areas containing radiological hazards where the integrated dose to a person may exceed 1 mSv per annum. They are enclosed or demarcated areas classified as stipulated in KAA-637.

3.1.14 **Surface Contamination** – The deposition of unwanted radioactive material on the surfaces of structures, areas, objects, or personnel.

3.1.15 **Surface Contamination Zones** – Radiological controlled zone areas containing loose or smearable surface contamination for α and ßγ emitters.

3.1.16 **Survey Maps** – A floor plan, displaying at least the major components, contact and general dose rates.

3.1.17 **Temporary Barrier** – A barrier used by RP to control access to radiation and/or contamination areas while an RP person is in attendance and is able to control radworkers activities within and outside these barriers. The need for signposting on the barriers is up to RP person discretion. When the RP person leaves the area and work is still in progress the temporary barrier becomes a permanent barrier and signposting must be placed at the barriers. When the work is completed within a temporary barricaded area, all barrier material must be removed as soon as possible.

3.2 Abbreviations

3.2.1 **µSv/h** – micro Sieverts per hour

3.2.2 **Bq** – becquerel

3.2.3 **CPM** – Counts per Minute

3.2.4 **CPS** – Counts per Second

3.2.5 **CZ** – Controlled Zone

3.2.6 **DVN** – NAB ventilation system

3.2.7 **KNPS** – Koeberg Nuclear Power Station

3.2.8 **NAB** – Nuclear Auxiliary Building

3.2.9 **RP** – Radiation Protection

3.2.10 **RPC** – Radiation Protection Certificate

3.2.11 **SOP** – Step off Pad

3.2.12 **SRPA** – Senior Radiation Protection Assistant

4.0 REFERENCES

4.1 Referenced Documents

4.1.1 238-54, Rev 0: Radiological Protection Licensing Requirements for Koeberg Nuclear Power Station

4.1.2 335-2, Rev 4: Koeberg Nuclear Power Station Management Manual

4.1.3 CPES RPI-613: Discrete Radioactive Particle Contamination Control

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

4.1.5 KAA-632, Rev 10: ALARA Programme

4.1.6 KAH-002, Rev 6: Radiation Surveillance Programme

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

4.1.8 KWH-S-001, Rev 19: Radiation and Surface Contamination Surveys

4.1.9 KWH-S-015, Rev 28a: Airborne Contamination Surveys

4.1.10 NPO Guideline 91-04 Rev 1: Guidelines for Radiological Protection at Nuclear Power Stations

4.2 Applicable Documents

4.2.1 KAA-637: Access Control to Radiological Controlled Zones

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

4.2.3 KWH-AL-007: Actions on Detecting Hot Spots

4.2.4 KWH-S-043: Control of Red Radiation Zones and Radiation Protection Locked Zones

5.0 PREREQUISITES

5.1 Radiological areas and boundaries should be conspicuous and should prevent inadvertent access and/or serve to notify plant personnel that an area is controlled for radiological purposes.

5.2 If an individual approaches a radiologically posted area, the boundary and postings should attract immediate attention from any point that might be used for access. The individual should be able to readily determine the types of radiological hazards present within the area and the protective requirements needed to access the area.

5.3 An informational poster to be displayed at the entrance of a SOP Area (See Appendix 8).

6.0 PRECAUTIONS AND LIMITATIONS

6.1 Previous applicable radiological data should be reviewed before conducting a survey.

6.2 If a wide range of dose rate levels are encountered, a supplementary survey map may be used to depict the various levels at the area of interest.

6.3 Use of Adhesive Tape.

6.3.1 Only tape with a CRACK label shall be used.

6.3.2 Yellow and red adhesive tape may be used for erecting tenting, wrapping equipment and placing / erecting signposting to non-plant equipment.

6.3.3 Yellow adhesive tape shall not come into contact with stainless steel plant systems or equipment.

6.3.4 Only nuclear grade duct tape (red) may be used directly on stainless steel plant systems or equipment. This tape shall be used as a base where all other stickers and labels will be affixed to pipes and plant equipment (e.g. Hot Spot stickers).

7.0 PROCEDURE

7.1 Signs

7.1.1 There are typically three types of signs used to identify various radiological hazards:

7.1.1.1 Pre-printed laminated signs (single sheets).

7.1.1.2 Pocket signs (holds individual inserts).

7.1.1.3 Outside weather resistant signs (pre-printed information).

7.1.2 Pre-printed laminated signs are used for long term/infrequently changing areas (Preferred method).

7.1.3 Pocket signs are primarily used where radiological conditions are temporary or transient in nature.

7.1.4 Signs bear the standard trefoil symbol in magenta, purple, or black (black is the least preferred) on a yellow background. In addition, the sign provides additional information on the posting to aid workers in minimising exposure to radiation or radioactive materials.

7.2 Pictures

7.2.1 Pictures are used to prescribe the protective clothing/dosimetry requirements needed to access an area. The picture should be displayed in the upper left corner with a trefoil and the word “CAUTION” to be displayed in the upper right hand corner. (See Appendix 8)

7.3 Inserts/ Pre-printed Information

7.3.1 Inserts and pre-printed information to be used on radiological postings as indicated below:

7.3.1.1 Radiation Area Poster (Green, Yellow, Orange, Red, RP Locked). (See Appendix 1)

7.3.1.2 Hot Spot Poster. (See Appendix 3)

7.3.1.3 Surface Contamination Area Posters (low, medium, high). (See Appendix 2)

7.3.1.4 Radioactive Material. (See Appendix 6)

7.3.1.5 Neutron Radiation Area. (See Appendix 5)

7.3.1.6 Radiography Poster. (See Appendix 4)

7.3.1.7 Airborne Radioactivity Area Poster. (See Appendix 7)

7.3.1.8 Informational Postings. (See Appendix 8)

7.3.1.9 Survey Maps. (See Appendix 9)

7.3.1.10 Area Not Routinely Surveyed Poster. (See Appendix 10)

7.4 Radiological Boundaries and Use of Radiation Rope

***NOTE**: A step off pad is not considered a barricade or physical barrier.*

7.4.1 When establishing a radiological boundary, ALARA/ Radiological Engineering concerns should be considered in the design of the area, e.g., lay down areas, number of personnel occupying the area, tools and equipment to be used.

7.4.2 Radiological boundaries typically consist of one or more of the following items:

- signs;
- barrier rope;
- barrier ribbon;
- stanchions;
- contamination tape;
- handrails;
- doors;
- step off pads, and any permanent or temporary walls;
- tensa barriers;
- extenda barriers;
- chains;
- spill blocks.

7.4.3 Barrier rope should be in good condition and continuous between attachment points.

7.4.4 Barrier rope connections should be neat and tidy.

7.4.5 The ends of barrier rope should be firmly secured where it connects to stanchions, etc. Excess barrier rope should be cut off, not wrapped around a stanchion or stuffed inside the stanchions.

7.4.6 Duct tape may be used to secure a knot by taping the loose ends of the rope. In areas of high heat or humidity, cable ties may be used in place of tape.

7.4.7 Braiding or twisting of radiation rope is not acceptable unless used in combination with another means such as cable ties.

7.4.8 For rope to wall connections, there are generally two standard methods for attaching a barrier rope to a wall:

7.4.8.1 Attaching the barrier rope to a stanchion next to the wall. The stanchion should be as close to the wall as possible, unless the area between the stanchion and the wall is intended for access to the area.

7.4.8.2 Attaching the barrier rope to a permanent structure, e.g., an I-beam, pillars, handrail, support member, etc.

7.4.8.3 When available, stanchions with smaller bases should be used to secure barrier ropes up close to walls. These allow the boundary to be erected without allowing a space between the stanchion and the wall.

7.4.8.4 Never attach barrier rope to conduits, electrical panels, operating equipment, or safety equipment in such a manner that could cause the equipment to be inoperable or become a hazard.

7.4.9 The use of adhesive materials (duct tape) to attach barrier rope or postings to plant structures or fixtures should not be utilised. This is due to the sticky residue and unsightly appearance of this method. This method has also been known to fail.

NOTE: *It is not acceptable to secure barrier rope to a wall, equipment, etc. with tape. The ideal situation is to obtain a stanchion, clip, etc., and secure the rope to this.*

7.4.10 Do not use barrier rope to secure signs to a boundary rope. Signs will be secured to the rope using cable ties wraps, key rings or by the snap buttons on the plastic insert signs. If the snap buttons do not work properly, use a different sign.

7.4.11 Barrier ropes should not be spliced to make a continuous rope.

7.4.12 Step off pads should be placed in low dose rate areas (if possible) and with personnel safety concerns addressed, e.g., overhead hazards, tripping hazards and potential falling objects.

7.4.13 A single or outer step off pad has to be placed outside the contamination boundary.

7.5 Use of Contamination Tape

7.5.1 Contamination tape must be used to delineate (define) perimeters of a radioactively Contaminated Area.

7.5.2 Contamination tape must be used in conjunction with or in place of barrier rope as a boundary to an area, e.g., to indicate contaminated handrails. In particular, radiation tape may be used by itself when barrier rope is impractical, e.g., around sample sinks, table tops, drains, to identify contaminated tygon tubing associated with catchment bags.

7.5.3 Barrier tape or equivalent must be used at the step off pad to define the Contaminated Area. Contamination tape must also be used along the entire perimeter of the Contaminated Area, but this tape is not to take the place of the required radiological signposting.

7.5.4 When a physical barrier exists, e.g., permanent or temporary walls, the use of barrier rope and/or contamination tape is not required as long as the posting is clear as to the hazard and its boundary.

7.6 Step Off Pad Boundaries

7.6.1 Step off pads may be used in two ways.

7.6.1.1 First, they may be used at the exit from radiological boundaries to remind personnel that the use of a portal monitor or whole body frisk is required prior to exiting the area. They may be used in conjunction with controlled zone boundary tape and positioned so that an individual exiting the area can read the message.

7.6.1.2 Second, they are used at the exits from contaminated areas to remind personnel to remove protective clothing prior to exiting. There are two ways this type of step off pad is used.

1) As a single or outer step off pad at the contaminated area boundary, being maintained in the clean area, used in conjunction with contamination area tape and positioned so the individual exiting can read the message.

2) Also, as an inner or double step off pad that is already in a contaminated area as a contamination control boundary, positioned so that an individual exiting the higher contaminated area can read the message.

7.7 Posting Doors

7.7.1 When posting a door, the sign should normally be positioned in the centre of the door about 120 to 180 cm high. When the door is propped open obscuring the posting, the sign shall be moved to a conspicuous location to ensure the area is properly posted.

7.8 Single vs Multiple Postings

7.8.1 When several hazards are present within a large area, posting a more restrictive radiological condition separately within the large area may be more appropriate. This method is preferred if the area is large enough to accommodate an additional posting and it does not present a safety hazard or confusion to the worker.

7.9 Information Postings

7.9.1 “No Entry Without Radiation Protection”: This posting is required for areas that are not normally (routinely) surveyed because of transient (brief) dose rates or anytime Radiation Protection deems necessary.

7.9.2 Areas posted as “No Entry Without Radiation Protection” must have a Qualified Radiation Protection person accompany the individual(s) into the area radiation field area on initial entry, in order to establish dose rates and contamination levels for the worker(s).

7.9.3 Protective clothing required for entry into an area (Yellow coveralls, Cotton gloves, Rubber Gloves, Booties, hardhat covers and overshoes).

7.9.4 Dosimetry required for entry into an area.

7.9.5 Additional information postings may be used at the discretion of Radiation Protection Supervision. These instances may include and are not limited to:

7.9.5.1 Entry to controlled zones.

7.9.5.2 Steam generator tents.

7.9.5.3 Exits from controlled zones which are not locked for safety reasons.

7.9.5.4 Low Dose areas.

7.9.5.5 Blocked sumps, floor drains and pipework.

7.10 Hoses, Cables and Cords

7.10.1 Hoses, cables, cords, etc., crossing a contaminated boundary should be secured. Use of straps around the stanchion is the preferred method of securing such items.

7.11 Use of Catch Containments (Catchment Bags)

7.11.1 Catch containments used within the CZ on contaminated systems should be yellow in colour unless authorised by RP Supervision.

7.12 Radioactive Markings

7.12.1 “Radioactive Material” labels, stickers, tags, or other designators (such as purple/ or yellow paint colour-coding) should be used to mark tools, clothing, and other materials utilised in the workplace which designate use of such material is restricted to the CZ and/or show radioactive contamination above background.

7.12.2 Respiratory equipment prepared for use are exempt from marking requirements while within the CZ.

7.12.3 General radiological markings, when used, are categorised as follows:

7.12.3.1 Equipment Tags.

7.12.3.2 Transfer Tags.

7.13.1 Signposting Radiological Controlled Zones

7.13.1 Areas must be demarcated and signposted as soon as possible after identification. The signposting should, where practical, include a conspicuous classification notice and a survey map that must have as a minimum: contact and general area dose rates of significant components in the room, location of person reading the map and Low Dose areas (if applicable).

NOTE 1: *Contamination and Hot Spots should be included as comments section of the map, since these are already marked separately in the room doserate readings and/or levels of smearable contamination.*

NOTE 2: *Maps and other signposting needs to be placed together (preferably next to or one above the other) at a conspicuous point at the entrance to an area, zone or room.*

NOTE 3: *Rope is the preferred option above tensa barriers, extenda barriers, chains and barrier ribbon.*

7.13.2 Areas in the Nuclear Auxiliary Building and Fuel Buildings that are not signposted with a Yellow or higher zone classification, are Green zones and do not require a zone classification notice.

7.13.3 All entrance areas to Controlled Zones must be posted and must indicate as a minimum the clothing and dosimetry requirements, zoning classification (all areas without a zone classification are Green zones), contamination card (if applicable). The signs for "No eating” etc., should be the pictures types.

7.13.4 Areas in the Reactor Building during maintenance shutdown that are not signposted with an Orange or Red zone classification are Yellow zones and do not require a zone classification notice.

7.13.5 The Reactor Building must have a Yellow zone classification notice and a signposting card that indicates that all areas without a zone classification are Yellow zones.

7.13.6 Areas without fixed physical boundaries (e.g. walls) must be defined by using appropriate radiation warning barriers at approximately waist height.

7.13.7 Area signposting must be controlled and updated routinely, subject to maintaining personnel exposure ALARA.

7.13.8 A zone containing Hot Spots need not be given a higher zone classification, provided the radiation level at 50 cm from the hotspot does not exceed the levels specified for the zone. Hot Spots shall be clearly signposted and, if necessary, shielded and barricaded (if practical).

7.13.9 A zone must not surround or enclose a zone of lower classification without the permission of a Senior Authorised Person (RP).

7.13.10 Red zones must be locked and signposted with the Red Zone sign, and insert as indicated in Appendix 1. If a lockable entrance to a red radiation zone is not available, then RP Plant will ensure that satisfactory methods be provided to prevent unauthorised access.

7.13.11 If any loose or smearable contamination is detected, the actual area must be signposted using the contamination signposting in Appendix 2. When a localised area exists within a room, or cluster of rooms, the entrance to these rooms must be signposted using posting “Surface Contamination in Demarcated Area” The signposting low, medium or high contaminated area poster will be placed at the barrier to the localised contamination area depending on the level of surface contamination indicated below:

	Contamination Level (Bq/cm^2)	
	β / γ	α
Green / Low	Detectable to 40 Bq/cm^2	Detectable to 4 Bq/cm^2
Yellow / Medium	≥ 40 Bq/cm^2 < 400 Bq/cm^2	≥ 4 Bq/cm^2 < 40 Bq/cm^2
Orange / High	≥ 400 Bq/cm^2	≥ 40 Bq/cm^2

7.13.12 When areas are set up in the Controlled Zone for Maintenance work to be performed on contaminated equipment, the SOP must be placed down by the RP Monitor, covering the work. Once the system/component is opened the relevant signposting must be placed at the barrier entrance to the area if it is classified as a permanent barrier.

NOTE: *During outages, the Reactor Building will be classed as a contamination zone and only areas exceeding 40 Bq/cm^2 (β/γ) are to be identified, demarcated and signposted.*

7.13.13 Updated weekly routine survey results must be recorded and displayed each week, or otherwise made readily available, at the Entrances to Controlled Zones for review by workers.

7.13.14 Doserates on the survey maps at the entrance to Yellow and Orange Zones must be updated when the general area doserates increase or decrease more than 25 µSv/h.

7.13.15 An uncontaminated area may be signposted as a potentially contaminated zone due to the nature of the work taking place or the possibility of contamination spread from breaching of active components. Appropriate access controls (e.g. step off pad /barricading) must be established.

7.13.16 RP Locked Zones must be locked and signposted with the sign and insert as indicated in Appendix 1. Entry into RP locked zones is covered in KWH-S-043.

7.13.17 Verification of Red radiation zones and RP locked zones only requires the RP person to verify that the area is properly locked (physically testing the lock by pulling and tugging) and signposted.

7.13.18 Declassification of areas shall be subject to a radiological survey, removal or change of signposting, and removal of locking devices, where applicable.

7.13.19 Hot Spot stickers are to be placed on all accessible Hot Spots. A risk assessment must be performed on all accessible and inaccessible Hot Spots in accordance with the Hot Spot Notification form. (Refer to KWH-AL-007, Appendix 1)

7.13.20 The large area maps at the NAB entrance must be updated on a quarterly basis to reflect the Red Zones, RP Locked Zones and Permanent SOP Areas, excluding the reactor buildings.

7.14 Signposting Hot Particle Zones

7.14.1 The classification of affected areas as hot particle control zones is done by an Authorised Person.

7.14.2 A double step-off-pad is to be installed.

7.14.3 Sticky mats can be placed at the exit on the clean side of the step-off-pads.

7.14.4 Physical barriers are to be erected.

7.14.5 The hot particle control area can only be de-zoned after it has been decontaminated, and/or it has been verified that the problem will not recur, i.e. work activities will not produce hot particles.

7.15 Use of Spill Blocks for Contamination Barriers

Only applicable to areas classified as wet loose contamination zones.

7.15.1 When Spill blocks are used to barricade loose contamination zones, the following guidelines shall be used:

- Ensure that all boundaries of the contaminated areas are barricaded off with Spill Blocks.
- Affix surface contamination tape on the Spill Block to indicate the direction of the contamination area.

7.15.2 Spill Blocks may also be used to contain and channel spillages in controlled zones.

7.15.3 Decontamination of Spill Blocks can be done through a wipe down the same time as the decontamination of the barricaded area. (Appendix 11)

8.0 ACCEPTANCE CRITERIA

N/A

9.0 RECORDS

9.1 Records of Radiological surveys are permanent records and must be retained in accordance with KSH-008.

10.0 ATTACHMENTS

Appendix 1 – Radiation Area Poster

Appendix 2 – Surface Contamination Area Poster

Appendix 3 – Hot Spot Poster

Appendix 4 – Radiography Poster

Appendix 5 – Neutron Radiation Area Poster

Appendix 6 – Radioactive Material Sticker

Appendix 7 – Airborne Radioactivity Area Poster

Appendix 8 – Informational Postings

Appendix 9 – Survey Maps

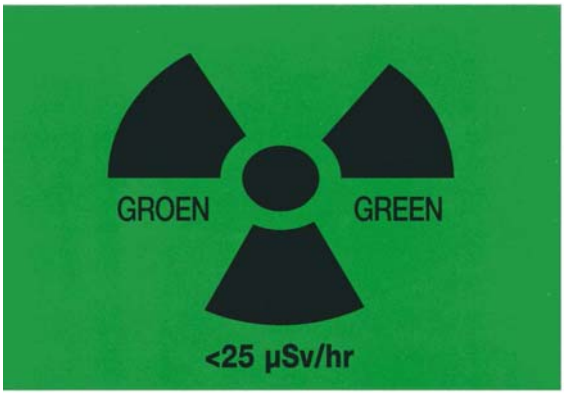
Appendix 10 – Areas Not Routinely Surveyed Poster

Appendix 11 – Use of Spill Blocks for Contamination Barriers

Appendix 12 – Justification

APPENDIX 1

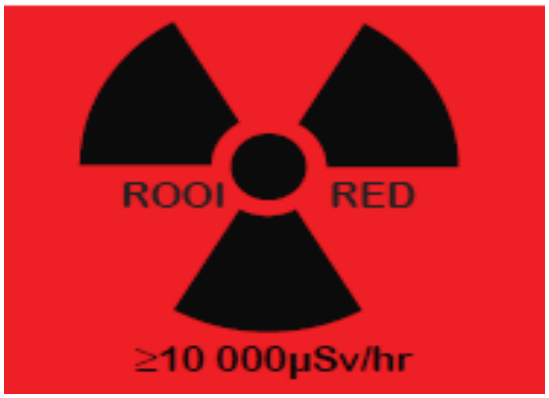
RADIATION AREA POSTER



GREEN ZONE

YELLOW ZONE

ORANGE ZONE



RED ZONE

RP LOCKED ZONE

APPENDIX 2

SURFACE CONTAMINATION POSTERS

Low Contaminated Area

Medium Contaminated Area

High Contaminated Area

Surface Contamination in Demarcated Area

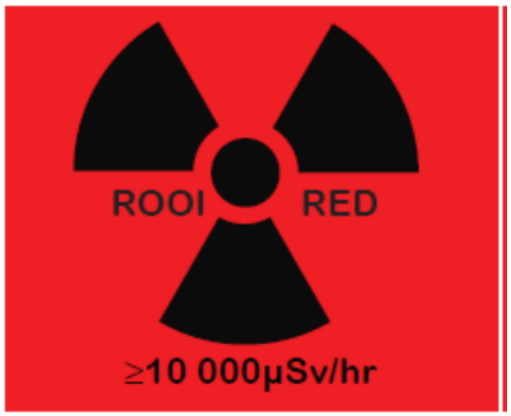
APPENDIX 3

HOT SPOT POSTER

APPENDIX 4

RADIOGRAPHY POSTER

DANGER



RADIOGRAPHY IN PROGRESS

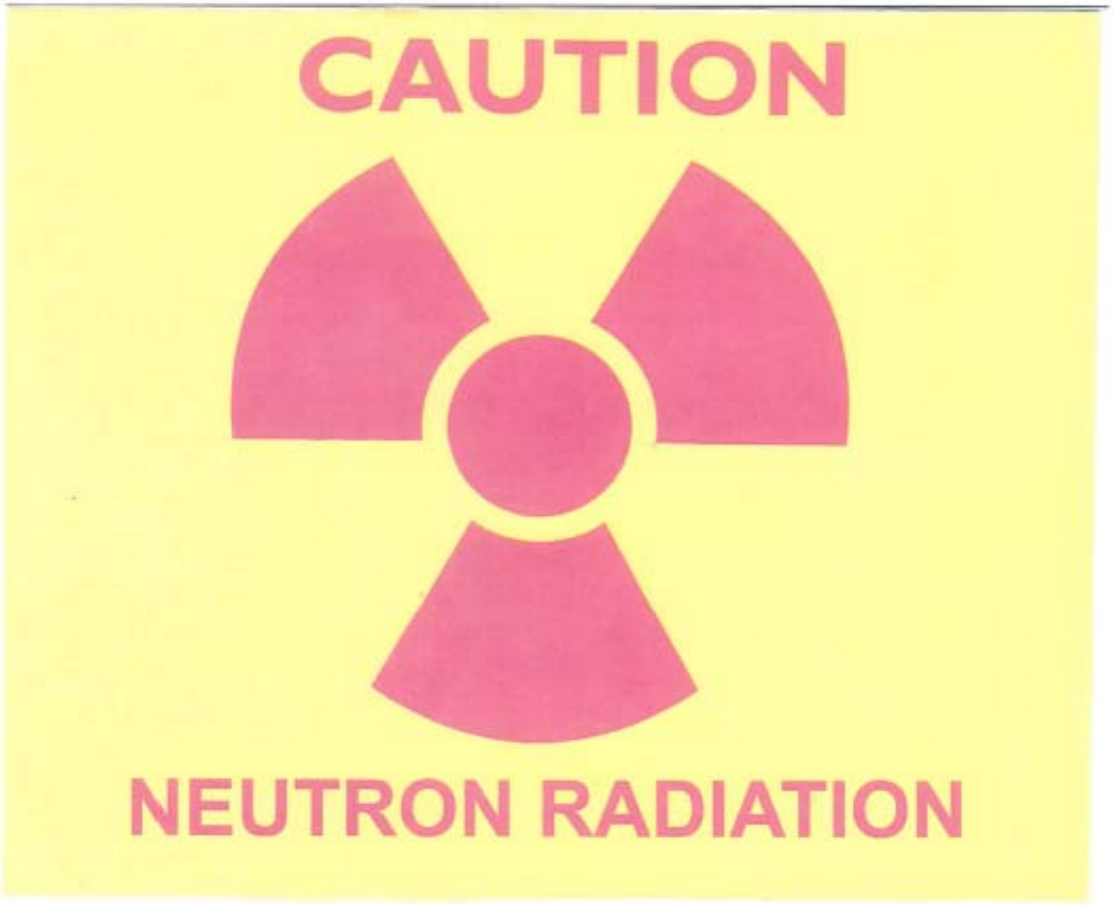
NO ENTRY WITHOUT RADIATION PROTECTION IN ATTENDANCE

CONTACT DUTY SRPA: 4232

EMERGENCY No: 4222

APPENDIX 5

NEUTRON RADIATION AREA POSTER



APPENDIX 6

RADIOACTIVE MATERIAL STICKER

90 x 90mm

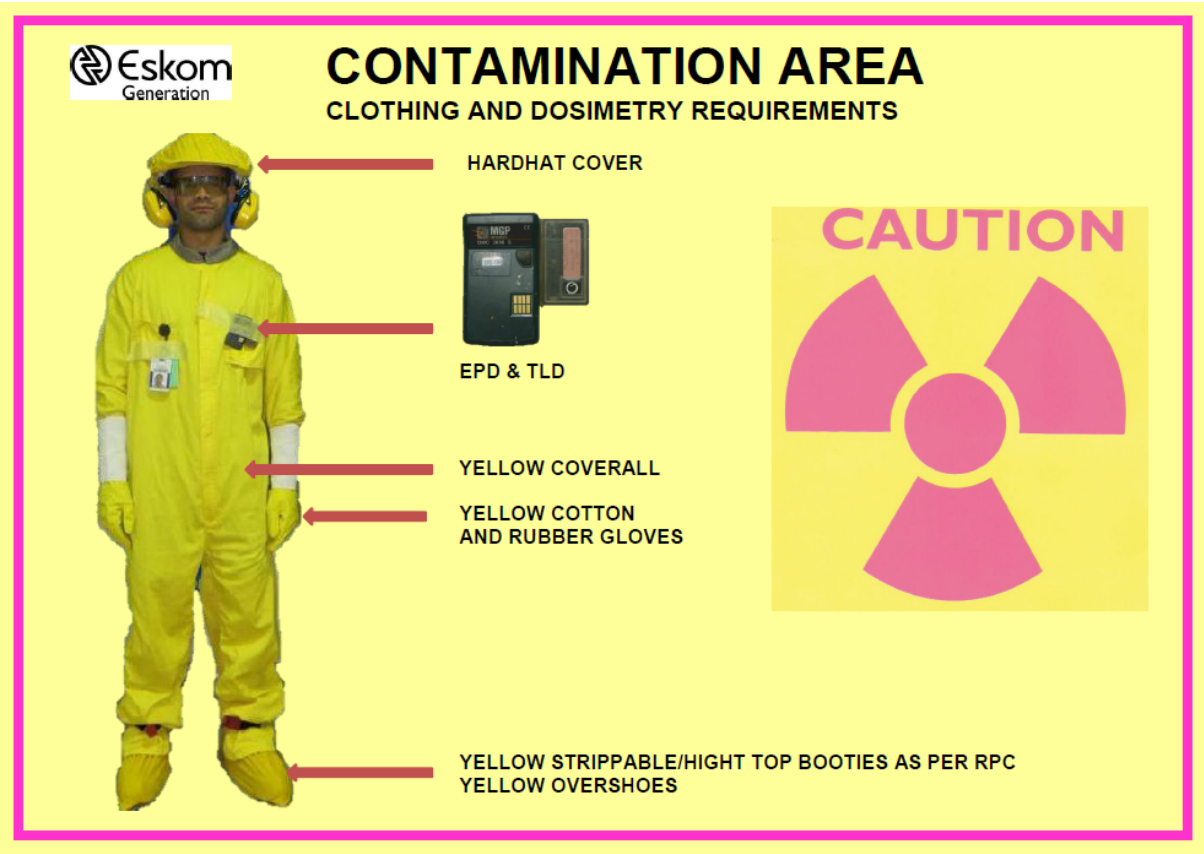
25 x 25mm

APPENDIX 7

AIRBORNE RADIOACTIVITY AREA POSTER

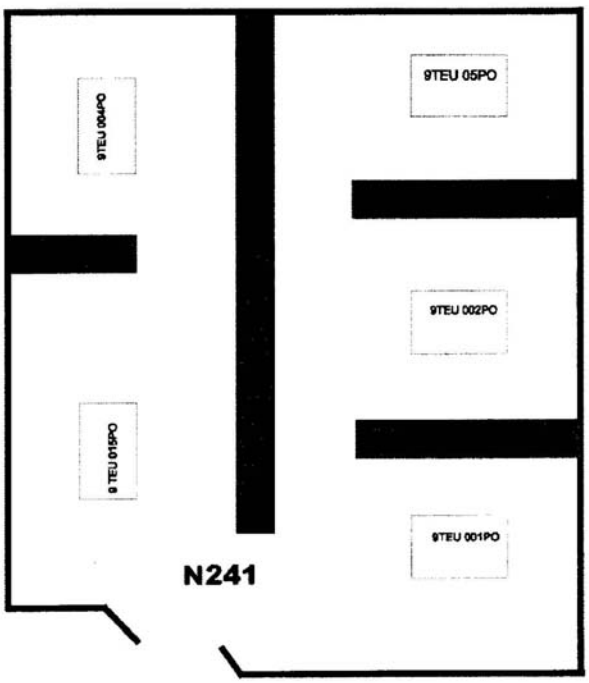
APPENDIX 8

INFORMATIONAL POSTINGS

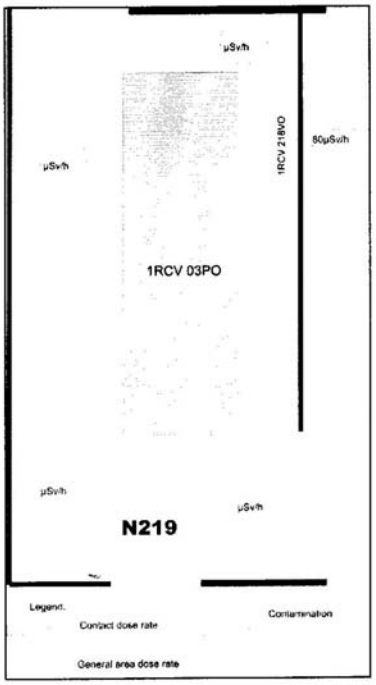


APPENDIX 9

SURVEY MAPS



EXAMPLE OF TEU PUMPS IN n241



EXAMPLE OF RCV PUMP ROOM

KWH-S-048APP10

APPENDIX 10

AREAS NOT ROUTINELY SURVEYED POSTER

APPENDIX 11

USE OF SPILL BLOCKS FOR CONTAMINATION BARRIERS

Connecting Spill-Blocks

- Each Spill-Block is comprised of the male connector and the female connector on either end (see image below).

- The connectors are connected to each other as in the image below.

- Multiple Spill-Blocks can be connected together in series depending on the perimeter requiring barricading.

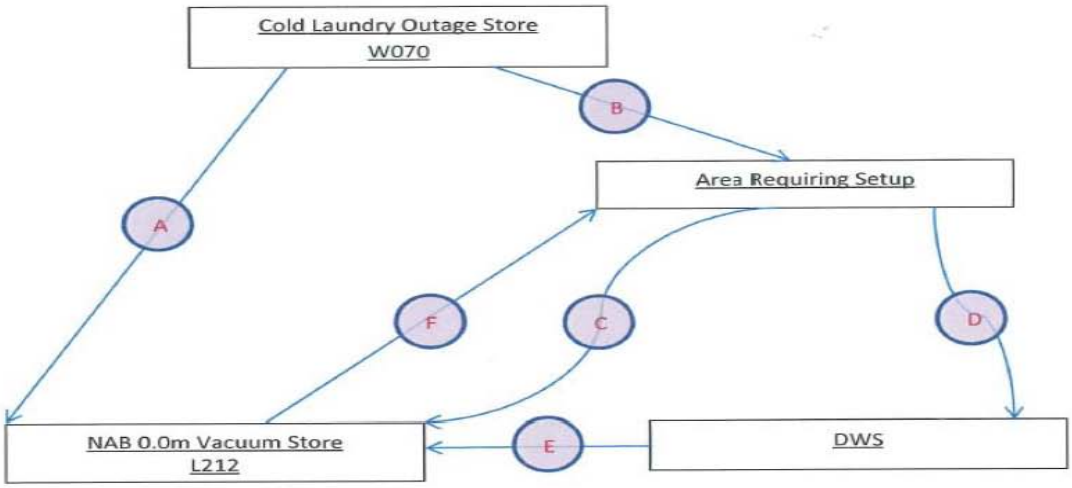
APPENDIX 11 (continued)

USE OF SPILL BLOCKS FOR CONTAMINATION BARRIERS

- A minimum of two Spill-Blocks can be connected together due to the instability of the Spill-Block when one Spill-Block is connected to itself.

Movement of Spill-Blocks

- The following process shall be used when moving Spill-blocks



From Storage to Job site

A. New Spill-Blocks are sent to NAB 0.0m Vacuum Store, or
B. Spill-Blocks are taken to the Area requiring setup from the Cold Laundry Outage Store.

After Using the Spill Blocks

C. Spill-Blocks are sent to NAB 0.0m Vacuum Store only when decontaminated to ND by swipe from the area that was setup.
D. Spill-Blocks are bagged and sent to DWS from setup area when Spill-Blocks could not be decontaminated to ND by swipe from the area that was setup.

E. Once Decontaminated to ND by swipe, Spill-Blocks are sent to the NAB 0.0m Vacuum Store from DWS.

Re-Use of the Spill Blocks

F. Spill-Blocks are taken to Area requiring setup from the NAB 0.0m Vacuum Store

APPENDIX 12

JUSTIFICATION

Revision 3

1. Full 3-yearly review to include minor editorial changes.

Revision 4

1. Full 3-yearly review.