Eskom	WORKING PROCEDURE	Allocation Centre 38A	Reference Number KWW-TES-010	Rev 6
NNR: NO No.:	FINAL CAPPING OF CONCRETE DRUMS			PAGE 1

KORC	ACCESS	IMPORTANCE CATEGORY	NEXT REVIEW DATE	DATE AUTHORISED
NO	Nuclear Restricted	SR	2026-03-17	2021-03-17

COMPILED / REVISED	REVIEWED	AUTHORISED
(sgd) U PHILANDER	(sgd) X NOVEMBER	(sgd) C Le ROUX
U PHILANDER	X NOVEMBER	C Le ROUX
SENIOR TECHNICIAN RADWASTE	SUPERVISOR RADWASTE	SENIOR SUPERVISOR RADWASTE
DATE 2021-03-17	**DATE** 2021-03-17	**DATE** 2021-03-17

THIS PROCEDURE HAS BEEN SEEN AND ACCEPTED BY:

U Philander Document Custodian

E Ellis ALARA

CATEGORY 2 – PROCEDURE AT THE JOB

FCA	ALARA REVIEW	SUPERSEDES
PROTECTION	YES 2021-03-15	KWW-TES-010, Rev 5 dd. 2020-01-21 FULL REVIEW

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1.0 PURPOSE

1.1 To describe the process for final capping of radioactive waste concrete drums.

2.0 SCOPE

2.1 Applicable to the final capping station – 6,7 m level NAB N031.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

N/A

3.2 Abbreviations

3.2.1 **RPC** – Radiation Protection Certificate

3.2.2 **RPM** – Radiation Protection Monitor

3.2.3 **SRPA** – Senior Radiation Protection Assistant

4.0 REFERENCES

4.1 Referenced Documents

4.1.1 335-2, Rev 5: Koeberg Nuclear Power Station Management Manual

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

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

4.2 Applicable Documents

4.2.1 DSG-318-207: Ready Mix Concrete for Waste Drum Capping Mix

4.2.2 KWW-TES-022: Operation of the Concrete Batching Plant for Dry and Wet Loads

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

5.0 PREREQUISITES

	ACTIONS AND CHECKS	SIGN
5.1	The final capping of radioactive waste concrete drums must be carried out by the Radwaste Section under a Work Order and an RPC.	
5.2	Inform SRPA Days and the SRPA on shift that capping activities will commence.	
5.3	Book out wet and dry vacuum from Radiation Protection Decontamination Section to vacuum the resin drums before capping.	
5.4	Ensure that the solid radwaste treatment system (TES) is available.	
5.5	Ensure that the demineraliser water distribution system (SED) is available.	
5.6	Ensure that the drain and vent system (RPE) is available.	
5.7	Ensure that the alarm processing system (KSA) is available.	
5.8	Ensure that the general control system (KRG) is available.	
5.9	Ensure that the instrument air distribution system (SAR) is available.	

6.0 PRECAUTIONS AND LIMITATIONS

		SIGN
6.1	**PRECAUTIONS**	
6.1.1	RPM to be in attendance for the duration of the capping process.	
6.2	**LIMITATIONS**	
6.1	This procedure can be performed in any unit state.	
6.2	Comply with Power Station Regulatory and Safety Standards.	

7.0 PRE-JOB PREPARATION

	ACTIONS AND CHECKS	SIGN
7.1	Receive the Work Request form the Vertical Planner and discuss the contents with the Supervisor.	
7.2	Check the availability of overhead crane 9 DMN 005 PR.	
7.3	Establish telephonic communication with the Outside Batching Plant Operator, and request the Operator to prepare the concrete capping mix.	
7.4	Ensure TES CCTV cameras are functioning.	
7.5	N030 cameras 9 TES 006 TV and 9 TES 007 TV must be switched on and off using respective pushbuttons on rack 9 TES 001 HG.	
7.6	N030 crane camera, 9 TES 004 TV, must be switched on using pushbutton 4 on rack 9 TES 001 HG and off at local power box 90 MN 005 PR.	

8.0 INSTRUCTIONS

8.1 Final Capping of Radioactive Waste Concrete Drums

ACTIONS AND CHECKS	IDENTIFICATION	OBSERVATIONS	SIGN
8.1.1 Energise the final capping control panel.	601 CC key switch	601 LA white cap indicator on panel lit.	
8.1.2 Pull out the emergency stop button.	601 TO hand-pump type	602 LA white cap indicator on control desk lit.	
8.1.3 Carry out a panel lamp test.	602 TO black pushbutton	All LA indicator caps lit on control desk.	
8.1.4 Check that the trolley is in the loading position.	605 TO black pushbutton	604 LA white cap indicator lit on control desk.	

CAUTION****

Only drums with a minimum curing time of 14 days with the exception of filter first fills which have a minimum curing time of 7 days after initial drumming are capped. Check the drum waste transfer form for drumming dates.

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ACTIONS AND CHECKS	IDENTIFICATION	OBSERVATIONS	SIGN
8.1.5 Using the overhead crane, transport the drum to be capped from the storage area to the capping station.	9 DMN 005 PR		
8.1.6 Check the details on the drum sticker and Waste Transfer Form to confirm adequate curing time of at least 14 days.	Yellow sticker attached to side of drum.	Date of drumming and dose rates.	
8.1.7 Lower the drum onto the trolley using a "spotter". Use slow speed for all crane movements at this stage to eliminate the drum swinging.			
8.1.8 Move the trolley with the drum to the concreting position.	603 TO black pushbutton	606 LA green cap indicator lit. 604 LA white cap indicator not lit.	
8.1.9 Make sure the trolley is in the concreting position.		605 LA white cap indicator lit. 606 LA green cap indicator not lit. 607 LA red cap indicator lit.	
8.1.10 When capping of resin drums are to occur, ensure that the drums are vacuumed prior to capping. Continue with step 8.1.11 for all other concrete containers.			
8.1.11 Retract the drip tray.	606 TO black pushbutton	608 LA white cap indicator not lit. 609 LA white cap indicator lit.	

NOTE: *Establish telephonic communication with the outside batching plant operators. They will advise when the capping mix is ready and will transport the mix to the outside capping station and position it on its stand. From this point onwards, communication must remain open between the inside and outside operators. If communication is lost, the capping process must be stopped until communication is re-established.*

ACTIONS AND CHECKS	IDENTIFICATION	OBSERVATIONS	SIGN
8.1.12 Confirm that the capping mix is transported from the concrete batching plant and positioned on its stand.		613 LA white cap indicator lit.	
(a) If concrete is delivered via a ready mix truck, continue with instructions listed in Appendix 1 and continue from section 8.1.14, IF NOT, continue from section 8.1.13.			
8.1.13 Perform the capping mix and associated quality requirements in accordance with KWW-TES-022.			
8.1.14 Instruct the outside operator to connect the wet mix hopper electrically.		Control of the hopper conveyor belt is now with the outside operator on the panel 9 TES 056 CR.	
8.1.15 Start the wet mix hopper conveyor on 9 TES 056 CR.		Conveyor on/off switch on 9 TES 056 CR switched to on by the outside plant operator.	
8.1.16 Start the agitator on 9 TES 056 CR.		Agitator on/off switch on 9 TES 056 CR switched to on by the outside plant operator.	
8.1.17 Fill the drum to be capped to the level of the top lip by stopping the wet mix conveyor.	611 TO red pushbutton	This will cease the operation of the agitator	
8.1.18 Stop the wet mix hopper conveyor on 9 TES 056 CR		Conveyor on/off switch on 9 TES 056 CR switched to on by the outside plant operator.	
NOTE: *To vibrate the wet concrete, move the vibrating needle through a series of figures of eight, using the lance control handles. Complete the manoeuvre by plunging the needle into the concrete at various points, using the raising and lowering pushbuttons. The vibration time is 30 to 35 seconds.*			
8.1.19 Open the air supply to the vibrator.			
8.1.20 Lower the vibrating lance into the drum and begin the vibrating sequence.	608 TO black pushbutton	610 LA white cap indicator not lit.	
8.1.21 On completion of the vibrating sequence, raise the vibrating lance to the high position.	609 TO black pushbutton	610 LA white cap indicator lit.	
8.1.22 Make sure that the results of the vibrating sequence are satisfactory and the level of the final cap is correct.			
NOTE: *The level of the finished cap should be **flush** with the top lip of the drum. If the level of the cap is below the top lip of the drum, a recess is left for water to accumulate and leach through the cap. If the level of the cap is above the drum top lip, it will make movement and stacking of the drums impossible.*			
8.1.23 Move the drip tray back into position.	607 TO black pushbutton	608 LA white cap indicator lit.	

ACTIONS AND CHECKS	IDENTIFICATION	OBSERVATIONS	SIGN
8.1.24 Move the trolley with the drum to the loading position.	605 TO black pushbutton	606 LA green cap indicator lit. 605 LA white cap indicator not lit.	
8.1.25 Make sure the trolley with the drum is in the loading position.		606 LA green cap indicator not lit. 607 LA red cap indicator not lit. 604 LA white cap indicator lit.	
8.1.26 If any concrete must be removed from the drum; it must be done at this stage using a wooden float. Remove by scraping off excess concrete into a container and finish off the surface with the wooden float.			
8.1.27 RPM takes dose rate readings on the drum top and side.		Results entered on the Waste Transfer Form (LLW-13).	
8.1.28 Using the overhead crane, lift the drum high enough to allow RPM to take dose rate readings on the base of the drum.	9 DMN 005 PR	Results entered on the Waste Transfer Form (LLW-13).	
8.1.29 Take the drum to a high position on completion of RPM readings and place it in the temporary storage area.	N030		
NOTE: *At the end of the capping process, or at the end of each working day, the capping station must be washed down. The outside operators must wash down the concrete descent tube first. The inside operators can then wash down, paying particular attention to the throat of the concrete descent tube, vibrator head and drip tray.*			
8.1.30 Shut down the capping station control panel.	601 CC key switch	601 LA white cap indicator on the panel not lit.	
8.1.31 Push in the emergency stop button to prevent unauthorised use of the capping station.	601 TO red hand-pump type	602 LA white cap indicator on control panel not lit.	
NOTE: *After final capping, a minimum curing time of two days must be observed before removal of the drums to the Low Level Waste Storage Building.*			

9.0 ACCEPTANCE CRITERIA

9.1 The impact on the technical reports demonstrating the safety and compliance of steel and/or concrete waste packages must be assessed for any review of this procedure.

10.0 RECORDS

10.1 All documentation generated must be retained as permanent records.

11.0 ATTACHMENTS

Appendix 1 – Off-Loading of Ready Mix Truck Requirements for Radwaste Operators in Terms of DSG-318-207

Appendix 2 – Justification

APPENDIX 1

OFF-LOADING OF READY MIX TRUCK REQUIREMENTS FOR RADWASTE OPERATORS IN TERMS OF DSG-318-207

DOCUMENTATION SUBMITTED BY CONTRACTOR PRIOR TO DELIVERY

- Certificate of Conformance relating to DSG-318-207
- Slump test results
- All results and analysis reports as required by SANS 1083
- Moisture content test results
- Grading curves

ON DELIVERY

- Slump test to be conducted by supplier on site – concrete to achieve a slump of 125 mm
- Cubes to be taken from ready mix concrete by Radwaste Operator

APPENDIX 2

JUSTIFICATION

Revision 5

1	Page 8, para 8.1.13	Action step “Perform the capping mix and associated quality requirements in accordance with KWW-TES-022” added to link the actual capping mix required to address CR 103041-002 GA.
		Safety Screening S10512

Revision 6

1	Page 8, para 8.1.14	Action step amended “Instruct the outside operator to connect the wet mix hopper electrically” to address GA 38209.
2	Page 8, para 8.1.14	Observation amended “Control of the hopper conveyor belt is now with the outside operator on the panel 9 TES 056 CR” to address GA 38209.
3	Page 8, para 8.1.15	Action step amended “Start the wet mix hopper conveyor on 9 TES 056 CR” to address GA 38209.
4	Page 8, para 8.1.15	Observation changed to “Conveyor on/off switch on 9 TES 056 CR switched to on by the outside plant operator” to address GA 38209.
5	Page 8, para 8.1.16	Action step added “Start the agitator 9 TES 056 CR” to address GA 38209.
6	Page 8, para 8.1.16	Observation added, “Agitator on/off switch on 9 TES 056 CR switched to on by the outside plant operator” to address GA 38209.
7	Page 8, para 8.1.17	Action step amended “Fill the drum to be capped to the level of the top lip by stopping the wet mix conveyor” to address GA 38209.
8	Page 8, para 8.1.17	Observation added, “This will cease the operation of the wet mix hopper” to address GA 38209.
9	Page 8, para 8.1.18	Action step added “Stop the wet mix hopper conveyor on 9 TES 056 CR” to address GA 38209.
10	Page 8, para 8.1.18	Observation added, “Conveyor on/off switch on 9 TES 056 CR switched to on by the outside plant operator” to address GA 38209.
		Subsequent paragraphs re-numbered.
		Safety Screening S11486