

 Eskom	Task Manual	<Select from list>
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Title: **<TASK MANUAL FOR XX
MAINTENANCE OF YY
EQUIPMENT>**

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1. Introduction

The document was compiled to align with NRS 082 requirements in ensuring that equipment in the Eskom network is maintained, and to ensure that Occupational Health and Safety Act (OHSA) requirements are met.

Insert text here, the text in "BLUE" can be removed if it is not required or relevant to the specific document and the text in "BLACK" must remain for standardisation purpose.

This Task Manual is the revision of the document that was initially compiled and titled TASK MANUAL FOR XX MAINTENANCE OF YY EQUIPMENT to formalize the procedures of performing tasks. The document includes the latest updates in information, format, photos to make the document more user-friendly, the critical tasks identified when doing this maintenance for the safety of maintenance staff. The introduction should not contain requirements.

Figure 1: Equipment (where required)

2. Supporting clauses

2.1 Scope

2.1.1 Purpose

The purpose of this Task Manual is to standardize maintenance tasks for maintaining TASK MANUAL FOR XX MAINTENANCE OF YY EQUIPMENT.

Or Include which maintenance is covered, such as inspections, tests, corrective and preventative maintenance, and for what reason. Also specify for what equipment the maintenance is applicable and the targeted user of the manual

2.1.2 Applicability

This document shall apply throughout Eskom and to contractors employed by the utility.

2.2 Normative/informative references

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

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems;
- [2] OHSA, Occupation Health and Safety Act 85 of 1993 and Regulations;
- [3] EPL_32-727, Safety, Health Environmental & Quality (SHEQ) policy;
- [4] EPC_32-520, Occupational Health & Safety Risk Assessment Procedure;
- [5] 240-170000064 Performing Maintenance Tasks while employing Covid-19 Preventive Measures - Engineering Instruction
- [6] 240-154263529 COVID-19 Protective Measures to be taken during the COVID-19 (Field Staff) - Work Instruction
- [7] 240-114967625, Operating Regulations for High Voltage systems;
- [8] 240-62196227, Life Saving-Rules;
- [9] 240-120054284, Personal Protective Equipment Standard;
- [10] DST_34-1954, Supervision of people in electrically hazardous locations;

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- [11] [240-70044736, Arc Flash Protective Clothing and Personal Protective Equipment against the Thermal Hazard of an Electrical Arc Specification;](#)
- [12] [240-86100853, Standard for Barricading Prohibited Area and Live Chamber;](#)
- [13] Manufacturer's manual.

2.2.2 Informative

- [14] 32-9, Definition of Eskom documents;
- [15] 32-644, Eskom documentation management standard;
- [16] 474-65, Operating Manual of the Steering Committee of Wires Technologies (SCOT);
- [17] 240-52380420, Steering Committee of Technologies (SCOT) Standards Development and Change Implementation Procedure;

2.3 Definitions

2.3.1 General

All definitions listed in recognised industry glossaries such as NRS 000, ORHVS and the IEV can be used wherever appropriate / applicable.

2.3.2 Disclosure classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Description
IEC	International Electro technical Commission
IEV	International Electro technical Vocabulary
OHSA	Occupational Health and Safety Act
ORHVS	Operating Regulations for High Voltage System
CMMS	
PCM	

2.5 Roles and Responsibilities

2.5.1 Group Technology shall be responsible for:

- a) Ensuring that job plans and task lists are configured as per the maintenance Engineering Standard and available in the respective CMMS; and
- b) Ensuring that job plans and task lists reference the correct task manual.

2.5.2 Training Department shall be responsible for:

- a) Where applicable ensure that the relevant training program is available to support the implementation of the task manual.

2.5.3 Plant Department (DX) / Performance and Works Planning Dept. (PWP) (TX) Managers shall be responsible for:

- a) Ensure that the CMMS is configured as per the requirement of the Maintenance Implementation Standard and maintenance (including defects and / or modification) is actioned as per the workflow process; and
- b) Ensuring that the correct maintenance feedback information is captured in the CMMS, is analysed and appropriate action is taken.

2.5.4 Zone Management / Specialized Maintenance & Support (DX) / HV Plant / Secondary Plant Manager (TX) shall be responsible for:

- a) Ensure that maintenance is assigned to staff who are trained, authorized and found competent to perform maintenance on the specific equipment;
- b) Ensure that the equipment is maintained as per the Work Orders requirements; and
- c) Ensure that the maintenance feedback information is captured into the CMMS and relevant maintenance feedback documentation is attached for future maintenance analysis.

2.6 Process for monitoring

Document number	Document title
240-45920887	Process Control Manual (PCM) for Manage Maintenance Base.
240-52380420	Steering Committee of Technologies (SCOT) Standards Development and Change Implementation Procedure
240-95116172	Maintain Wires PCM

2.7 Related/supporting documents

List related documents and documents superseded by this document.

Also list the forms and records that you have referred to and which shall be maintained, if there are any. If there are no related/supporting documents, insert 'Not applicable' to retain paragraph numbering

Document number	Document title
<240-xxxx>	TASK MANUAL FOR XX MAINTENANCE OF YY EQUIPMENT _ Critical Task Observation / Risk Assessment
<240-xxxx>	TASK MANUAL FOR XX MAINTENANCE OF YY EQUIPMENT_ Circuit-Breaker Report

3. Requirements

3.1 Pre-Planning

3.1.1 Previous Maintenance Information / Records

- a) Additional work e.g. Modifications, defects etc.

3.1.2 Spares and Materials

Insert text here where applicable and when not the text "Not applicable" should be in this section.

Include any relevant spares and materials in this section ie.:

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3.1.3 Tools and equipment

Insert text here where applicable and when not the text “Not applicable” should be in this section.

Include any relevant tools and equipment in this section ie.:

- a) Standardised Tool Set;

3.1.4 Personal protective equipment

All personal protective equipment shall be in accordance with 240-44175132 the additional requirements from the on-site assessment of the equipment installation arc flash energy rating. All PPE shall be approved and comply with the identified arc flash energy rating.

3.2 Safety and preparation

Insert text here.

Include any relevant safety or preparatory requirements including the list below where applicable.

- a) Ensure that the panel is isolated and earthed in accordance with 240-114967625.
- b) Where required ensure that barricading is erected in accordance with 240-86100853.
- c) Ensure that D.C supply to the panel is isolated to prevent accidental closing or tripping of the circuit-breaker.
- d) Risk assessment and Signing of permit and worker’s register shall be done in accordance to EPC_32-520 and 240-114967625 before the commencement of work and approved safe work procedures shall be practiced / followed.
- e) Erect scaffolding (where required).
- f) Ensure all tools, equipment and materials are placed inside the barricaded area where they will not hinder or obstruct any work.
- g) Environmental hazards shall be removed in accordance with EPL_32-727.

3.3 Routine Inspection

Insert text here where applicable and when not the text “Not applicable” should be in this section.

This section should contain all the routine inspection activities (on line) that should be carried out on the relevant equipment.

3.4 Maintenance

3.4.1 On Site Risk Assessment

- a) Perform a proper risk assessment before task commencement or continuously during task execution in accordance with the prescribed procedure and ensure that all members of team are included when performing risk assessment.

NOTE 1: When doing an on-site risk assessment ensure that the measures to mitigate and / or minimize the associated risks and hazards are developed before executing the task.

- b) Do not take short cuts to save time.
- c) Ensure that poor visibility due to insufficient light/lighting are addressed during the task execution
- d) Lack of proper communicating ability – language, instructions, signals, etc.
- e) Ensure that the appropriate PPE and safety equipment are identified, inspected and worn / used during execution of the task.

- f) Develop measures to mitigate danger that can be caused by tools, equipment and material being used.
- g) Where required manage the vegetation as per the document “management and maintenance within Eskom land, servitudes and right of way” (240-70172585).

3.4.1.1 Pandemic related specific safe work assessment

- a) The following activities shall be performed by persons in charge of work:
 - Evaluate maintenance tasks to determine whether safe social distances can be maintained, and other (normal) safe work procedures are not compromised, for example, communication by the PIC with staff in the proximity of live equipment.
 - Perform the normal risk assessment, as per the task manuals, **and** consider the specific risk associated with applying PANDEMIC RELATED preventative measures. Including an additional item in the normal risk assessment, which will include the risk of PANDEMIC RELATED infections. Risks may increase due to PANDEMIC RELATED PPE applied.
 - PPE, as per task manual, shall be utilised as prescribed, **and** PANDEMIC RELATED PPE shall be applied as **additional** safeguards.
- b) Both the safe work procedure (240-170000064) and PANDEMIC RELATED (240-154263529) precautions shall be applied. If one or the other are compromised; health and safety are at risk, then the maintenance activity shall not be started, or shall be stopped (if the task is already in progress), unless appropriate risk mitigating measure can be put in place or be rescheduled after the PANDEMIC restrictions are lifted.

3.4.2 Procedure

Insert text here.

This section should contain the procedure / sequence of carrying out the maintenance on the relevant equipment.

3.4.3 Test and Measurements

Insert text here where applicable and when not the text “Not applicable” should be in this section.

All the relevant tests procedures and measurements reading to be captured in this section:

3.5 Modifications

Insert text here where applicable and when not the text “Not applicable” should be in this section.

Where applicable, include modification procedures if no published documents exist or document references to modification. Where no modification is required “Not applicable” below should remain in this section.

4. Forms and Records

The maintenance feedback sheet prescribed in annexure A must be populated and form part of the feedback to the Works Coordinator.

The Work Order must be populated with maintenance feedback and the relevant maintenance feedback documentation and attached to the Work Order.

Information highlighted on the maintenance feedback form must captured in the WO as per JP or Task List requirements

5. Authorization

This document has been seen and accepted by:

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(The following table must be completed to reflect all parties that were involved in the Comments Review Process for this document. Standard Policy dictates that these are all the parties/managers/managers of divisions that are affected by the content of this document.)

Name and surname	Designation
Amelia Mtshali	Senior Manager Power Delivery Eng.: DBOUS
Archie Jaykaran	SCOT/SC Chairperson
Andre Bekker	Middle Manager Design Eng.: DBOUS
Sphiwe Nkosi	Chief Engineer

6. Revisions

This revision 0 of Task Manual DMN_ <240-xxxx> is the first of this document.

Date	Rev	Compiler	Remarks
Aug 2018	1	D Ntombela	The first revision of the document published as <240-xxxx>

7. Development team

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

This Task Manual was previously prepared by:

Name	Designation	Department/OU

8. Acknowledgements

Not applicable.

Annex A– Equipment Feedback sheet

(Normative)

Where applicable include all relevant check / feedback sheets as annexures.

	FORM TITLE	CIRCUIT-BREAKER		
	FORM NUMBER	<240-xxxx>	REV DATE	July 2019
	DOCUMENT TITLE	TASK MANUAL FOR XX MAINTENANCE OF YY EQUIPMENT		

SUBSTATION		PANEL / FEEDER		POLE NUMBER	
Circuit-breaker					
MAKE		TYPE		SERIAL NUMBER	
				R Ph:	
kV	AMPS	kA		W Ph:	
				B Ph:	
Mechanism					
TYPE		DRIVE		SERIAL NUMBER	
				R Ph:	
HEATER		COUNTER		W Ph:	
		Before:	After:	B Ph:	
SUPPLY VOLTAGE: (tick which is applicable)		110 V D.C.		220V D.C.	220V A.C.

TESTS						
Contact resistance (micro-ohm)				Contact penetration (mm)		
	R Phase	W Phase	B Phase	R Phase	W Phase	B Phase
TEST 1						
TEST 2						
TEST 3						

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Coils					
Minimum voltage (70 % Of Nominal)					
Main trip	R Ph:	W Ph:	B Ph:		
Back-up trip	R Ph:	W Ph:	B Ph:		
Close	R Ph:	W Ph:	B Ph:		
Current					
Coil amperage	Main trip:	Back-up:	Close:		
Coil resistance	Main trip:	Back-up:	Close:		
Speed recording test					
Phase	Close	Trip	Trip/close	Close/trip	
Red A					
Red B					
White A					
White B					
Blue A					
Blue B					
Motor rewind time to recharge spring					
Time discrepancies between phases			Trip:	Close:	
Insulation test				SF6 gas alarm test	
	R Phase	W Phase	B Phase	Rated Nominal pressure at 20oC	
S to E				Alarms	
L to E				Lock-out at	
S to L					

SF6 Gas Analysis								
	Specified Values	R Phase	W Phase	B Phase				
Dew Point	≤ 300 ppm or -100 C							
Percentage	≤ 3 % (SF6 context ≥ 98 %)							
Decomposition Products	≤ 180 ppmv							
SF6 Gas Leak test								
Checklist								
	Good	Replaced		Good	Replaced		Good	Replaced
Fixed contacts			Oil / SF6 / Vacuum			Coils		
Arcing ring			Gauge glasses			Motors		
Moving contacts			Seals			Pumps		
Transfer contacts			Valves			Contacto r		
Arc control device			Door seals			Counters		
		Inspect	Lubricated	Free		Inspect	Lubricate d	No leaks
Close latch					Drives			
Trip latch					Damper			
Needle bearings					Springs			
Interlocks					Shafts			
Mechanism Test								
Operate correctly								

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Mechanism / Levers System		
Recommendations/Comments:		
WORK DONE BY..... SIGNATURE:		
ACCEPTED BY: DATE:		

Annex B – Task Observation

(Informative)

	FORM TITLE		OBSERVATION FORM		
	FORM NUMBER		<240-xxxx>	REV DATE	July 2019
	DOCUMENT TITLE		TASK MANUAL FOR XX MAINTENANCE OF YY EQUIPMENT		

1.	OBSERVER'S PARTICULARS				
	Task	observer's	name:	Task	observed:
	_____		_____		
	Section	/	department:	Location:	
	_____		_____		
	Occupation:	Is there a procedure / task manual for this task?		YES	NO
	_____			<input type="checkbox"/>	<input type="checkbox"/>
	Date:	Task Manual ref. _ <240-xxxx> _ _____			

	Time	with	task:	Work	order
	_____	_____	_____	_____	no.:

2.	REASON FOR OBSERVATION				
	Planned:	<input type="checkbox"/>	Follow-up:	<input type="checkbox"/>	
	Name of employee being observed:				

3.	TASK OBSERVATION				
	Did employee adhere to the procedure/practice requirements?				
		Yes	No	N/A	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Preplanning carried out correctly				4. Use of correct PPE
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Emergency contacts numbers Obtained				5. Ensure that the panel / equipment to be commissioned is isolated and earthed in accordance with EPC_32-846
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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Tools equipment:				6. Carry out the task as per task manual <240-xxxx>			
Used correctly							
In good and safe condition							
Test instrument calibrated							
Toolbox Talk:							
Task manuals used							
Complete Worker's register							
Risk Assessment been done							
Valid work permits available							
Could observed practices / conditions lead to:							
1. Injury:				2. Illness (fumes, gas, etc.)			
Risk of getting caught by				3. Costs (delays)			
Risk of striking against/get struck by				4. Poor quality (non-conformance)			
Risk of fall from same level							
Risk of fall from different level							
Risk of slip, trips and falls							
Risk of electrocution							
4.	NON COMPLIANCE PRACTICE OBSERVATION						
	Yes	No	N/A		Yes	No	N/A
1. Working at unsafe speed				7.Failure to warn			
2. Using unsafe equipment				8. Taking chances			
3. Using equipment unsafely				9. Failure to identify hazards			
4. Unsafe loading, placing & lifting				10.Failure to secure lock-out			

	5. Taking unsafe position				11. Safety signs ignored			
	6. Safety rules ignored							
NOTE: ALL OBSERVED CLASS HAZARDS SHALL REQUIRE IMMEDIATE INTERVENTION								
5.	OBSERVED DEVIATIONS / NON-CONFORMANCES							
6.	RISK BEHAVIOURS							
7.	PROPOSED CONTROLS							
	Compile a procedure for this task			Issue a standing instruction				
	Revise present procedure			Change work methods				
	Retraining of employees			Professional referral				
	Engineering revision			Coaching				
8.	ANALYSIS							
	IAC – inadequate capability		ABU – abuse or misuse / equip / drugs or alcohol		MAIN – inadequate maintenance			
	KNO – lack of knowledge		NAT – natural factors		EQU – inadequate equipment			
	SKI – lack of skill		LEA – inadequate leadership		STA – inadequate work / train Standards			
	STR – stress		ENG – inadequate engineering		WEA – wear & tear			
	MOT – improper motivation		PUR – inadequate purchasing		CON – inadequate control			

9.	DISCUSSION BETWEEN SUPERVISOR/OBSERVER AND EMPLOYEE	
	1. EMPLOYEE EXPLANATION FOR RISK BEHAVIOUR:	
	2. AGREEMENT TO CHANGE AT RISK BEHAVIOUR:	
10.	FOLLOW-UP ACTIONS	WHEN / WHO

Person being Observed signature: _____ Date: _____

Signature (Task Observer): _____ Date: _____

Signature Chairperson Safety Committee: _____ Date: _____
(if deviations were found)