




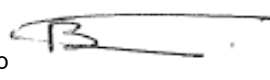
	<b>MATLA POWER STATION</b>  <b>SCOPE OF WORK</b>	Template Identifier	240-43921898	Rev	6
		Document Identifier	14593	Rev	4
		Effective Date	October 2019		
		Review Date	October 2022		

PLANT AREA: Generator export system					
TITLE: <i>Provision of maintenance services (disconnecting, clean, installation, torquing, sealing and commissioning) for Matla power station generator export system</i>					
REF: <b>MEE-06107</b>		Reference Rev No: 1		MULTIDISCIPLINARY: No	
					Plant Level: 1
COMPILED BY	Name: <b>S. Mvuyana</b> Systems Engineer	Signature: 		Date: 30/11/2020	
APPROVED	Name: <b>N. Maseko</b> Line Manager	Signature: 		Date: 16/11/2020	
APPROVED	Name: <b>L. Masote</b> Group Manager	Signature: 		Date: 29/11/2020	
REVIEWED	Name: <b>N. Pawasemewa</b> Quality Department	Signature: 		Date: 2020/11/19	
REVIEWED	Name: <b>B. Moeng/ R. Mokobodi</b> Environmental Department	Signature: 		Date: 17.11.2020	
ACCEPTED	Name: <b>M. Nhlanhla</b> Outage Manager/ Maintenance Supervisor/ Maintenance Manager/ Operating Manager/ Projects Coordinator	Signature: 		Date: 17.12.2020	
ACCEPTED	Name: <b>N/A</b> AIA	Signature: N/A		Date: N/A	

**NB: Do not tamper with the template.**

#### **GENERAL**

- Data books, reviews, reports and diagrams/drawings shall be submitted to Engineering after the completion of the work. Engineering to forward the data books to Quality Department (Document Control)
- All QCP's to be submitted to Engineering and Quality for approval prior to outage/project or maintenance work commencement.

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1.1	Safety	<ul style="list-style-type: none"><li>All work is to be done in accordance with Matla plant procedures and safety regulations. (GGR 0992).</li><li>Matla power station induction must be done before any work commences.</li><li>Permit to work must be in place before any work commences.</li><li>Worker's register must be completed and daily risk assessment conducted before any work commences.</li></ul>	Eskom to witness.	Contractor
1.2	Environmental Management.	<ul style="list-style-type: none"><li>All activities listed in the National Environmental Act 107 of 1998, EIA Regulations as amended, must have environmental <b>AUTHORISATION</b> before commencement of work.</li><li>The contractor shall comply with all applicable legal and other requirements.</li><li>The polluter pays principle will be applied.</li><li>The contractor manager shall ensure compliance with Eskom Matla Environmental procedures to ensure the prevention of pollution (refer: OMOP 4090 and 4402).</li><li>The last payment will be processed based on the status of the last housekeeping check sheet (Annexure C: OMOP 4402) of designated area.</li><li>EMS file based on ISO14001 will be required.</li></ul>	Eskom to witness.	Contractor
1.3	Quality Management	<ul style="list-style-type: none"><li>The contractor/executioner of work will be responsible for drawing up all QCP documentation and this must be approved by engineering and authorised by the Quality Department before commencing with the work.</li><li>Contractors/executioner to adhere to QM 58 and OMOP4497 requirements</li></ul>	Hold point	Contractor

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		<ul style="list-style-type: none"><li>Number of NCR issued can affect your next tendering process.</li><li>The QCP shall be signed progressively by the Engineer/Supervisor, Eskom QC Inspector, Contractor QC Inspector and/or AIA.</li><li>No procuring of outage items without the approval of scopes by quality</li><li>All outage scopes creep and scopes addition should be approved by quality</li><li>No contractor should be in the possession of scopes for execution without the scopes approved by quality</li><li>The contractor is subjected to quality auditing at any point in time during execution of scope</li></ul>		
1.4	Inputs from other departments	None	N/A	N/A
1.5	Commissioning reference	N/A	N/A	Contractor
		N/A		

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### 2. Decommissioning and or Plant Isolation

2.1	The employer shall ensure that all relevant circuits are de-energized and isolated. All circuit must be isolated accordingly where applicable	All work shall be performed in accordance with the latest revision of PSR (36-681)	<b>OPS</b> – to ensure that all necessary earths are applied where necessary	OPS
2.2	Where necessary the employer shall ensure that ensure that supplies to cables are isolated and any other potential source	All work shall be performed in accordance with the latest revision of PSR (36-681)	<b>OPS</b> – to ensure that all necessary isolations, fuses, links etc. are removed.	OPS
2.3	The contractor shall ensure all personnel working on the plant or system shall be competent and shall sign into the workers register and report to the employers responsible person as per Eskom's plant safety regulations	All work shall be performed in accordance with the latest revision of PSR (36-681). RPs to ensure plant is safe prior to permit acceptance	<b>Contractor</b> – shall ensure plant is isolated accordingly with a permit to work in place.	Contract or

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### SECTION 3: SITE PREPARATION

3.1	The employer shall provide all necessary scaffolding for work to be completed on all various areas.	a. The contractor shall notify the employer of all scaffolding requirements for various areas where access is required. b. Where any further preparation requirements are needed the contractor shall highlight them to the employer as soon as they are noted.		N/A
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### SECTION 4: WORKS DETAIL REQUIREMENTS

#### Generator star and load side

4.1	Inspection, Disconnection, Reconnection and Maintenance of copper flexibles	<ul style="list-style-type: none"><li>a. Perform an external inspection of star and load point for defects on roofing and structure and effect the required repairs</li><li>b. Remove all six Star and Load point covers and Clean covers</li><li>c. Remove CT brackets to facilitate access into the cubicle</li><li>d. Perform external cleaning of star and load side structure</li><li>e. Use vacuum cleaners and rags to clean out dust in the interior of cubicle</li><li>f. Clean interior of cubicles with Chesterton 273 including the bushing insulator and all CTs</li><li>g. All traces of oil ingress must be removed in every cubicle</li><li>h. Inspect flexibles for overheating/hot connections</li><li>i. Disconnect and remove all flexibles on Star point as well as Load point</li><li>j. All flexibles that is removed: Position must be marked on the flexible with a permanent marker</li><li>k. 48 white phase flexibles to be removed</li><li>l. 96 red and blue phase flexibles to be removed</li><li>m. Removed flexibles must be cleaned</li><li>n. Removed Transitional washers and dome washers on flexibles must be replaced</li><li>o. Contractor to provide all required transition and dome washers</li><li>p. Contractor to provide all the required washers.</li><li>q. If a flexible is damaged, shows signs of overheating or has loss of copper sheeting of a large extent, it must be replaced</li><li>r. Inspection on bushings for any defects</li><li>s. Place cleaned flexibles in position and use new transitional washers between every flexible and aluminium bushing terminal.</li></ul>	<p>H: QCPs and necessary documentation shall be submitted for approval before any work commencement.</p> <p>Engineering or an approved employer representative shall witness and approve all work executed.</p>	Contractor
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		<ul style="list-style-type: none"><li>t. Torque ALL flexibles</li><li>u. Torque setting: 90 Nm (flexible to gen terminal bushing)</li><li>v. Torque setting: 95 Nm (flexible to busbar)</li><li>w. Re-check every torqued bolt; mark every torqued bolt with permanent marker.</li><li>x. Rivet all aluminium bolts used to fix Star and Load point covers to cubicle, to inside of star and load point cubicle.</li><li>y. Replace all damaged nuts on Star and load point frame</li><li>z. Reconnect CT brackets</li><li>aa. Perform final inspection of cubicles for foreign objects, dust, material</li><li>bb. Replace rubber seals on star and load point covers</li><li>cc. Check all protection and measurement wiring, CTs for secureness and report any damage of loose connections</li><li>dd. Replace star and load side bellows if required. Contractor to provide bellows</li><li>ee. Ensure all star and load point vents are open upon completion</li></ul>		
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### Breaker, interrupter and machine bar earths

4.2	Inspection, Disconnection, Reconnection and Maintenance of copper flexibles	<ul style="list-style-type: none"><li>a. Perform an external inspection of breaker, interrupter and machine bar earths defects on covers and external earth strap connections and structure and effect the required repairs</li><li>b. Perform external cleaning of breaker, interrupter and machine bar earths defects on covers and external earth strap</li><li>c. Use vacuum cleaners and rags to clean out dust in the interior of all areas</li><li>d. Clean interior of cubicles with Chesterton 273 including the bushing insulators and all solid busbars</li><li>e. All traces of dust, oil and water ingress must be removed in every IPB and breaker</li></ul>	H: QCPs and necessary documentation shall be submitted for approval before any work commencement.  Engineering or an approved employer representative shall	Contractor
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		<ul style="list-style-type: none"><li>f. Inspect flexibles for overheating/hot connections</li><li>g. Disconnect and remove all flexibles on breaker, interrupter and machine bar earths</li><li>h. All flexibles that is removed: Position must be marked on the flexible with a permanent marker</li><li>i. Removed flexibles must be cleaned</li><li>j. Removed Transitional washers and dome washers on flexibles must be replaced</li><li>k. Contractor to provide all required transition and dome washers</li><li>l. Contractor to provide all the required washers.</li><li>m. If a flexible is damaged, shows signs of overheating or has loss of copper sheeting of a large extent, it must be replaced</li><li>n. Inspection on bushings for any defects</li><li>o. Place cleaned flexibles in position and use new transitional washers between every flexible and aluminium bushing terminal.</li><li>p. Torque ALL flexibles</li><li>q. Torque setting: 90 Nm (flexible to aluminium terminal bushing)</li><li>r. Torque setting: 95 Nm (flexible to busbar)</li><li>s. Re-check every torqued bolt; mark every torqued bolt with permanent marker.</li><li>t. Rivet all aluminium bolts used to fix Star and Load point covers to cubicle, to inside of star and load point cubicle.</li><li>u. Replace all damaged nuts on cubicle frame</li><li>v. Perform final inspection of cubicles for foreign objects, dust, material</li><li>w. Replace rubber seals on star and load point covers</li><li>x. Replace star and load side bellows if required. Contractor to provide bellows</li></ul>	witness and approve all work executed.	
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		y. Ensure cover clips points are replaced if required and that all cover earth straps are tightened accordingly.		
<b>Generator and Unit transformers including IPBs</b>				
4.3		<ul style="list-style-type: none"><li>a. Perform an external inspection of transformers aluminium IPBs , and earth connection defects on covers and external earth strap connections and structure and effect the required repairs</li><li>b. Perform external cleaning of transformers and IPBs earths defects on covers and external earth straps</li><li>c. Use vacuum cleaners and rags to clean out dust in the interior of all areas</li><li>d. Clean interior of cubicles with Chesterton 273 including the insulators and solid busbar</li><li>e. All traces of dust and water ingress must be removed in every cubicle</li><li>f. Inspect flexibles for overheating/hot connections</li><li>g. Disconnect and remove all flexibles on all transformers</li><li>h. All flexibles that is removed: Position must be marked on the flexible with a permanent marker</li><li>i. Removed flexibles must be cleaned</li><li>j. Removed Transitional washers and dome washers on flexibles must be replaced</li><li>k. Contractor to provide all required transition and dome washers</li><li>l. Contractor to provide all the required washers.</li><li>m. If a flexible is damaged, shows signs of overheating or has loss of copper sheeting of a large extent, it must be replaced</li><li>n. Inspection on bushings for any defects</li><li>o. Place cleaned flexibles in position and use new transitional washers between every flexible and aluminium bushing terminal.</li></ul>	H: QCPs and necessary documentation shall be submitted for approval before any work commencement.  Engineering or an approved employer representative shall witness and approve all work executed.	Contractor

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		<ul style="list-style-type: none"><li>p. Torque ALL flexibles</li><li>q. Torque setting: 90 Nm (flexible to aluminium terminal bushing)</li><li>r. Torque setting: 95 Nm (flexible to busbar)</li><li>s. Re-check every torqued bolt; mark every torqued bolt with permanent marker.</li><li>t. Rivet all aluminium bolts used to fix all covers to cubicle,</li><li>u. Replace all damaged nuts on cubicle frame</li><li>v. Perform final inspection of cubicles for foreign objects, dust, material</li><li>w. Replace rubber seals on all covers</li><li>x. Replace all bellows if required. Contractor to provide bellows and ensure they are adequately sized</li><li>y. Ensure all cover clips points are replaced if required and that all cover earth straps are tightened accordingly.</li></ul>		
<b>VT chamber generator side and transformer side</b>				
4.4		<ul style="list-style-type: none"><li>a. Perform an external inspection of VTs cubicles on both generator and transformer side including aluminium IPBs , and earth connection defects on covers and external earth straps connections and structure and effect the required repairs</li><li>b. Perform external cleaning of VTs and associated bushings and IPBs busbar defects including covers and external earth straps</li><li>c. Use vacuum cleaners and rags to clean out dust in the interior of all areas</li><li>d. Clean interior of cubicles with Chesterton 273 including the insulators and solid busbars</li><li>e. All traces of dust and water ingress must be removed in every cubicle</li><li>f. Inspect flexibles for overheating/hot connections and report these</li></ul>	<p>H: QCPs and necessary documentation shall be submitted for approval before any work commencement.</p> <p>Engineering or an approved employer representative shall witness and approve all work executed.</p>	Contractor

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		<ul style="list-style-type: none"><li>g. Disconnect and remove all flexibles on all connection points</li><li>h. All flexibles that is removed: Position must be marked on the flexible with a permanent marker</li><li>i. Removed flexibles must be cleaned</li><li>j. Removed Transitional washers and dome washers on flexibles must be replaced</li><li>k. Contractor to provide all required transition and dome washers</li><li>l. Contractor to provide all the required washers.</li><li>m. If a flexible or conductor is damaged, shows signs of overheating or has loss of copper sheeting of a large extent, it must be replaced</li><li>n. Inspection on bushings for any defects</li><li>o. Place cleaned flexibles and cables in position and use new transitional washers between every flexible and aluminium bushing terminal.</li><li>p. Torque ALL connection points and ensure the connection does not damage any of the components, torque values to be determined together with engineering</li><li>q. Re-check every torqued bolt; mark every torqued bolt with permanent marker.</li><li>r. Rivet all aluminium bolts used to fix all covers to cubicle,</li><li>s. Replace all damaged nuts on cubicle frame</li><li>t. Perform final inspection of cubicles for foreign objects, dust, material</li><li>u. Replace rubber seals on all covers and ensure that all latches are replaced if necessary</li><li>v. Replace all bellows if required. Contractor to provide bellows and ensure they are adequately sized</li><li>w. Ensure all cover clips points are replaced if required and that all cover earth straps are tightened accordingly.</li></ul>		
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<b>Excitation transformers</b>				
4.5		<ul style="list-style-type: none"><li>a. Perform an external inspection of excitation transformer cubicles on both transformer and earthing transformer side including aluminium IPBs , and earth connection defects</li><li>b. Perform external cleaning of VTs and associated bushings and IPBs busbar defects including covers and external earth straps</li><li>c. Use vacuum cleaners and rags to clean out dust in the interior of all areas</li><li>d. Clean interior of cubicles with Chesterton 273 including the insulators and solid busbars</li><li>e. All traces of dust and water ingress must be removed in every cubicle</li><li>f. Inspect all cables for overheating/hot connections and report these</li><li>g. Disconnect and remove all cable connections on all connection points</li><li>h. All flexibles that are removed: Position must be marked on the flexible with a permanent marker</li><li>i. Removed cables must be cleaned</li><li>j. Removed Transitional washers and dome washers on flexibles must be replaced</li><li>k. Contractor to provide all required transition and dome washers</li><li>l. Contractor to provide all the required washers.</li><li>m. If a flexible or conductor is damaged or shows signs of overheating or has loss of copper sheeting of a large extent, it must be replaced</li><li>n. Inspection on bushings for any defects</li><li>o. Place cleaned flexibles and cables in position and use new transitional washers where deemed necessary</li></ul>	<p>H: QCPs and necessary documentation shall be submitted for approval before any work commencement.</p> <p>Engineering or an approved employer representative shall witness and approve all work executed.</p>	Contractor

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- p. Torque ALL connection points and ensure the connection does not damage any of the components, torque values to be determined together with engineering
- q. Re-check every torqued bolt; mark every torqued bolt with permanent marker.
- r. Rivet all aluminium bolts used to fix all covers to cubicle,
- s. Replace all damaged nuts on cubicle frame
- t. Perform final inspection of cubicles for foreign objects, dust, material
- u. Replace rubber seals on all covers and ensure that all latches are replaced if necessary
- v. Replace all bellows if required. Contractor to provide bellows and ensure they are adequately sized
- w. Ensure all cover clips points are replaced if required and that all cover earth straps are tightened accordingly.

### Isolated phase busbar aluminium sheeting

4.6	Welding of the aluminium sheeting, installation of new aluminium sheeting and replacement of bellows at various points as and when determined (ONLY AS AND WHEN REQUIRED – TO BE DETERMINED AFTER DETAILED INSPECTIONS)	<ul style="list-style-type: none"><li>a. Perform an external inspection aluminium sheeting and bellows which are installed on the IPB system</li><li>b. If defects are noted on any point of the IPB</li><li>c. All traces of dust and water ingress must be removed in every cubicle and on every area of the IPBs internally and externally</li><li>d. Inspect all IPBs externally for signs of overheating and circulating current points for overheating/hot connections and report these</li><li>e. Where damage or none sealed areas are noted on the IPBs, these will require to be re-welded to ensure there are no defects,</li><li>f. Where damage is noted on aluminium sheeting the contractor shall provide the required aluminium sheeting which shall have</li></ul>	<p>H: QCPs and necessary documentation shall be submitted for approval before any work commencement.</p> <p>Engineering or an approved employer representative shall witness and approve all work executed.</p>	Contractor
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# MATLA POWER STATION

## SCOPE OF WORK

Template Identifier	240-43921898	Rev	6
Document Identifier	14593	Rev	4
Effective Date	October 2019		
Review Date	October 2022		

	SCOPE OF WORK DESCRIPTION / ACTIVITY	PROCEDURE, SPECIFICATION, ENG. REQUIREMENTS / DOCUMENTATION	HOLD POINTS, WITNESS, REPORTS	RESPONS IBLE PARTY
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		<p>a minimum thickness of 10mm, the area shall be as per the required/ damaged area.</p> <ul style="list-style-type: none"><li>g. It is the responsibility of the contractor to provide a qualified welded as per all Eskom welding requirements along with a fire watcher for all welding activity</li><li>h. The contractor shall provide and install all rubber bellows where they are damaged or aged and shall install these as required</li><li>i. Perform final inspection of cubicles for foreign objects, dust, material</li><li>j. Replace rubber seals on all covers and ensure that all latches are replaced if necessary</li></ul>		
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### SECTION 5: DOCUMENTATION AND CONFIGURATIONS HANDOVER

5.1	Handover documents	<ul style="list-style-type: none"><li>a. The contractor shall provide 2 hard copy files and electronic device files of all hand over documentation,</li><li>b. All equipment and com test reports, shipping and handling record,</li><li>c. Operating and maintenance manuals, and engineering guideline documents,</li><li>d. Where any modifications are done the contractor shall submit updated drawings in DGN version for the client on the same electronic storage medium</li></ul>	<b>H:</b> The updated final documents shall be submitted before closing of the project	Contractor
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### SECTION 6: RE-COMMISSIONING

6.1	All circuits which were placed out of service for maintenance purposes shall be signed off for completeness	a. All workers shall need to have signed out and the responsible permit holder shall satisfy himself that there are no people still working on the line prior to energization as per PSR (36-681).	<b>Contractor and RP</b> to be present.	Contractor
6.2	Equipment used for earthing and isolation.	a. The employer shall ensure that all relevant equipment used for earthing and isolating is removed as per PSR (36-681) requirements and accounted for prior to energization of the line.	<b>Employer</b> to ensure all permits are cleared and the plant is in a service	Employer

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(SOW OF WORK VARIATION WILL BE ISSUED ONLY IF REFURBISHMENT OR REPLACEMENT COMPONENTS EXCEED BUDGET)

SUBSYSTEM		BILL OF MATERIALS					
No	REPLACE/ REFURBISH	COMPONENT DESCRIPTION	COMPONENT / MATERIAL SPECIFICATION	OPERATING PARAMETERS	PART / NUMBER	STOCK NUMBER	DESIGN QUANTITY
1		Cone washers					
		Transition washers					
		Rubber seals					
		Copper plates					
		Trap washers					
		Solon washers					
		Flat washers					
		Bolts					
		Nuts					
		Copper flexibles					
		Aluminium sheeting					
		Rubber bellows					


See attached drawings.

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SCOPE COMPILATION REFERENCES				
SOURCE & Ref No.	Yes	No	N/A	Comments
Previous outage service reports	X			Past outage reports for unit outages
Return to service data packages			X	None
Maintenance Strategy with Rev number	X			RBO maintenance strategy
SAP defects (attach list as appendix)			X	None
GHRMS (STEP) reports (Generation Heat Rate Management System)			X	None
Online Condition Monitoring			X	None
Pre-outage performance test results			X	None
Post outage performance test results			X	None
GPSS/ Plant Performance data on UCLF incurred			X	None
OMS / IIRMS recommendations (Audits Reports)			X	None
Risk controls (IRM system)			X	None
Previous audits and reviews (e.g. ERAP)			X	None
Engineering Change Requests (Projects)			X	None
LOPP strategy reports			X	None
URS			X	None
Philosophy (Outage)	X			Scope to be used for outage maintenance contract to be placed
Condition Monitoring Report			X	None
VA/PHD Viewer trends			X	None
Corrective Actions			X	None

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CARAB reports			X	None
Statutory Requirements			X	None
Grid code requirements			X	None
Waivers and Exemptions			X	None
Calibration requirements			X	None
Previous Outage SOW variations			X	None
Post Mortems Actions from previous outages			X	None
Pre-Outage plant walks			X	None
Risk based inspection (RBI) report			X	None
Simulation, TOIs, OON, SI			X	None
Stock replenishing	X			Yes, purchasing of existing stock items.

Comments


Compiled by: S. Mvuyana

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