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PLANT AREA Boilers 1 to 6 smoke stack gas analysers			
TITLE Boilers 1 to 6 smoke stack gas analyser calibration, service and repair			
REF	Reference Rev No 01	MULTIDISCIPLINARY No	Plant Level 1
COMPILED BY	Name Mafuss Khanyile System Engineer	Signature	Date 2020-10-01
APPROVED	Name Sibusiso Ngcobo Acting C&I Engineering Manager	Signature	Date 2020-10-01
APPROVED	Name Lele Masole Group Manager	Signature	Date 07/10/2020
REVIEWED	Name Quality Department	Signature	Date
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ACCEPTED	Name Xolani Dashe C&I Maintenance Department	Signature	Date 07/10/2020
ACCEPTED	Name	Signature N/A	Date N/A

	SCOPE OF WORK DESCRIPTION / ACTIVITY	PROCEDURE, SPECIFICATION, ENG REQUIREMENTS / DOCUMENTATION	HOLD POINTS, WITNESS, REPORTS	RESPONSIBLE PARTY
1 1	Safety	• Safety file must be submitted and must meet all the Eskom safety file requirements • All work is to be done in accordance with Matla plant procedures and safety regulations (GGR 0992) • Matla power station induction must be done before any work commences • Permit to work must be in place before any work commences • Worker's register must be completed and daily risk assessment conducted before any work commences	Hold Point	Contractor
1 2	Environmental Management	• All activities listed in the National Environmental Act 107 of 1998, EIA Regulation 982,983,984 & 985(2014), must have **AUTHORISATION** before commencement of work • The contractor shall comply with all applicable legal and other requirements • The polluter pays principle will be applied • The contractor manager shall ensure compliance with Eskom Matla Environmental procedures to ensure the prevention of pollution (OMOP 4090) • The last payment will be processed based on the status of the last housekeeping check sheet (Annexure G OMOP 4018) of designated area EMS file based on ISO14001 will be required	Hold Point	Contractor

1 3	Quality Management	• 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 • Contractors/executioner to adhere to QM 58 and OMOP4497 requirements • Number of NCR issued can affect your next tendering process • The QCP shall be signed progressively by the Engineer/Supervisor, Eskom QC Inspector, Contractor QC Inspector and/or AIA • No procuring of outage items without the approval of scopes by quality • All outage scopes creep and scopes addition should be approved by quality • No contractor should be in the possession of scopes for execution without the scopes approved by quality • The contractor is subjected to quality auditing at any point in time during execution of scope	Hold point	Contractor
1 4	Adherence to Eskom policies, procedures and guidelines	If the contractor s not familiar with these policies, procedures and guide lines, then the contractor must request Eskom to provide these documents	Hold Point	Contactor
		Matla power station induction is to be completed before any work commences	Hold Point	Contactor
1 5	Commissioning reference	All work is to be carried out ONLY after daily proper risk assessments are conducted and the permit to work is in place The limited access register also needs to be signed on a daily basis	Hold Point	Contactor

	SCOPE OF WORK DESCRIPTION / ACTIVITY	PROCEDURE, SPECIFICATION, ENG. REQUIREMENTS / DOCUMENTATION	HOLD POINTS, WITNESS, REPORTS	RESPONSIBLE PARTY

DETAILED SCOPE

	SCOPE OF WORK DESCRIPTION / ACTIVITY	PROCEDURE, SPECIFICATION, ENG REQUIREMENTS / DOCUMENTATION	HOLD POINTS, WITNESS, REPORTS	RESPONSIBLE PARTY
2.1	The Scope of work for **four (4) site visits per month** (one (1) site visit per week) Carry out Bi-monthly Gas Analyser calibrations (twice a month), and two calibration verifications plus inspections (twice in a month) for south stack (common stack for unit 1, 2, &3) and for Unit 4, 5 & 6 (Individual stacks per unit on the North Stack) The Smoke Stacks are equipped with PROCAL Pulsi 2000 gas analysers units for monitoring the following gasses a Sulphur Dioxide (SO2) – 0 to 2000 ppm b Nitric Oxide (NO) – 0 to 2000 ppm c Carbon Dioxide (CO2) – 0 to 20% d Moisture (H2O) – 0 to 15% e Carbon Monoxide (CO) – 0 to 500 ppm Additional Instruments Installed a ABB 2600T series stack pressure – 0 to 1200Mbar (A) b Durag D-FL-220 flowmeter (Unit 4 to 6) c Durag D-FL-100 flowmeter (South Stack) with purging system d FUJI type ZFK8 zirconia oxygen e K1000 thermocouple Check the performance and return to normal levels of emissions to determine the condition of optical equipment	PROCAL Pulsi 2000 Calibrate SO2, CO2, CO and O2 analysers Calibrate the H2O Analyser once per year Calibration to be carried out as per OEM manual chapter 5 240-56242363 Eskom Emissions Monitoring and Reporting Standard Calibration certificates are to be submitted to Matla within one week of calibration One pager report to be submitted to Engineering department and Maintenance department within one week of visiting site	Hold	Supplier

	SCOPE OF WORK DESCRIPTION / ACTIVITY	PROCEDURE, SPECIFICATION, ENG. REQUIREMENTS / DOCUMENTATION	HOLD POINTS, WITNESS, REPORTS	RESPONSIBLE PARTY
2 2	Service the south stack (boiler 1 to 3), boiler 4, boiler 5, and boiler 6 flue gas exit, gas analysers and associated equipment as stipulated below in order to ensure reliabilityand availability a Monthly service • Visual inspection of the optical head unit forphysical and corrosion damage • 'Visual inspection of the auto zero/purge unit forphysical and corrosion damage • Visual inspection of all cables and connections forintegrity and damage • Clean the stack velocity meter air purge unit filter b Annual service • Internal inspection of the optical head unit forsigns of Ingress of dust, moisture or gases • Check that the source is emitting and that the exit lens is clean • Check all mirrors, lenses and optical filter forcleanliness • Check the filter wheel motor for ease of operation • Visual inspection of all cables and gas connections for Integrity and damage • Check the PT100 platinum resistance	PROCAL Pulsi 2000 Service to be carried out as per the OEM manual chapter 5 Report on the work performed, spares used, spares requirements for future use Replace and repair all faulty components Findings to be Communicated to Engineering and Maintenance in a formof a report within 24 hours of solving the fault	Hold	Supplier

	SCOPE OF WORK DESCRIPTION / ACTIVITY	PROCEDURE, SPECIFICATION, ENG. REQUIREMENTS / DOCUMENTATION	HOLD POINTS, WITNESS, REPORTS	RESPONSIBLE PARTY
	thermometer resistance Note Optical spares, filters and gaskets required for the service is to be included		Hold	Supplier
2 3	Supply the required test gas to perform the bi-monthly calibrations as per item 2 1 above		Hold	Supplier
2 4	Repair the smokestack gas analysers as and when required This will include all of the analysers and equipment as installed on the stack to ensure an availability of at least 95%	Allowance to be made for worst case scenario	Hold	Supplier
2 5	To ensure compliance to Matla safety requirements, two Technicians per visit are required, For continuity of service Matla requires three Technicians to be available at short notice (Safety clearance and induction completed)			
2 6	Affiliation to the Stack Testers Association of South Africa is recommended			

BILL OF MATERIAL

Description		Unit	Quantity	Rate
Consumables & spares for Procal P2000				
P2000 Process Lens		No.	20	
P2000 Main Lens		No.	20	
P2000 Sample mirror		No.	20	
Gasket for P2000 in-situ heater		No.	80	
Gasket for P2000 mounting flange		No.	80	
Gasket for P2000 lens inner seal		No	80	
Gasket for P2000 process lens outer seal		No.	80	
Gasket for P2000 end mirror (3 tie rod)		No.	80	
Gasket Clamp Ring (6 hole)		No	40	

Gasket for Tie Rod		No.	240	
Pressure transducer assembly		No.	10	
PCB assembly 2-1180J00		No.	10	
Sinter assembly 500mm SS		No	5	
IR source for P2000		No.	5	
AVU Coil		No.	15	
AVU Valve seal		No.	60	
AVU Valve 15mm N/C		No.	10	
AVU Valve 15mm N/O		No.	10	
Input Module 2-1103-00		No	10	
Output Module 2-1190-00		No	10	
Comms chips 5-1584-83		No.	20	
Opto-isolators		No.	20	
Procal Input output Unit (32 input board replacement)		No	5	
Procal In-Situ Heater 1.8 m		No	5	

Gasket for O2 analyser blanking plate		No.	40	
Ceramic Filter Assembly		No.	40	
Replacement detector element for ZFK8 230V		No.	20	
Purge Air Unit (Blower)		No.	5	
Blower air filter		No.	15	
D-FL220 Measuring head replacements		No.	20	
(10L)Gas Cylinder O2, (NO+cO2), (SO2+CO)		No	10	
(50L)Gas Cylinder O2, (NO+cO2), (SO2+CO)		No	10	
Year 1 maintenance of Procal Analysers				
Maintenance and calibration of Procal P2000 analysers twice a month visit for 1 year - includes labour and travel		No.	48	

Health and Safety - includes file, medicals and inductions		No.	1	
Year 2 maintenance of Procal Analysers				
Maintenance and calibration of Procal P2000 analysers twice a month visit for 1 year - includes labour and travel		No.	48	
Health and Safety - includes file, medicals and inductions		No.	1	
Year 3 maintenance of Procal Analysers				
Maintenance and calibration of Procal P2000 analysers twice a month visit for 1 year - includes labour and travel		No.	48	
Health and Safety - includes file, medicals and inductions		No.	1	

Year 4 maintenance of Procal Analysers				
Maintenance and calibration of Procal P2000 analysers twice a month visit for 1 year - includes labour and travel		No.	48	
Health and Safety - includes file, medicals and inductions		No.	1	
Year 5 maintenance of Procal Analysers				
Maintenance and calibration of Procal P2000 analysers twice a month visit for 1 year - includes labour and travel		No	48	
Health and Safety - includes file, medicals and inductions		No.	1	
TOTAL				

SCOPE GOMPILATION REFERENCES

N/A

SCOPE COMPILATION REFERENCES				
SOURCE & Ref No	**Yes**	**No**	**N/A**	**Comments**
Previous outage service reports			x	
Return to service data packages			x	
Maintenance Strategy with Rev number			x	
SAP defects (attach list as appendix)			x	
GHRMS (STEP) reports (Generation Heat Rate Management System)			x	
Online Condition Monitoring			x	
Pre-outage performance test results			x	
Post outage performance test results			x	
GPSS/ Plant Performance data on UCLF incurred			x	
OMS / IIRMS recommendations (Audits Reports)			x	
Risk controls (IRM system)	x			
Previous audits and reviews (e g ERAP)			x	

Engineering Change Requests (Projects)			x	
LOPP strategy reports			x	
URS			x	
Philosophy (Outage)			x	
Condition Monitoring Report			x	
VA/PHD Viewer trends			x	
Corrective Actions			x	
CARAB reports			x	
Statutory Requirements	x			Eskom's Emissions Monitor ng and Rep ort ng Standard 240-56242363 (474-187)
Grid code requirements			x	
Waivers and Exemptions			x	
Calibration requirements	x			
Previous Outage SOW variations			x	
Post Mortems Actions from previous outages			x	
Pre–Outage plant walks			x	
Risk based inspection (RBI) report			x	
Simulation, TOIs, OON, SI			x	

COMMENTS

Compiled by: Mafusi Khanyile