Eskom	Specification	Kusile Power Station

Title: **Kusile Power Station Provision of Maintenance Quality Control Service Scope of Work**

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1. Introduction

Kusile Power Station Management has decided to partner with a suitable and qualified service provider for the Provision of Maintenance Quality Control Services at Kusile Power Station. The strategy to outsource these services is driven by the urgent need to ensure that maintenance tasks, whether performed when units are online or offline, meet the highest quality standards. This will be achieved through the Co-ordination and Control of Quality Control Activities (Assurance/ Inspection) and the Performance of Physical Inspections in Maintenance and Outage Services.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to specify the scope of work requirements for partnering.

2.1.2 Applicability

This document shall be applicable throughout Eskom Kusile Power Station.

2.1.3 Effective date

This document is effective from the date of authorisation until the next document has been authorised or until it is officially de-authorised.

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] ISO 10005 Quality Management Systems – Guidelines for Quality Plans

[3] 240-105658000 Supplier Quality Management Specification (QM-58)

2.2.2 Informative

[4] ISO 9000 Quality Management System – Fundamentals and Vocabulary

[5] 32-727 Safety, Health, Environment, and Quality (SHEQ) Policy

[6] ISO 10006 Quality Management Systems – Guidelines for Quality Management in Projects

[7] ISO 9004 Managing for the Sustained Success of an Organisation – A Quality Management Approach

2.3 Definitions

2.3.1 Contractor: Service provider contracted for supplying specific service to Eskom, Kusile Power Station.

2.3.2 Employer: Eskom, Kusile Power Station

2.3.3 Employer Representative: Any person appointed in writing by Employer as the delegated Employer representative in terms of the provisions.

2.3.4 Plant: Any structure, machinery, apparatus, or equipment which does not fall within the scope of the operating regulations for high voltage systems, and excludes, mobile, portable lifting equipment, domestic circuits' appliances, and tools.

2.4 Abbreviations

Abbreviation	Explanation
PCLF	Planned Capability Loss Factor
QCP	Quality Control Plan
SOW	Scope of Work
UCF	Unit Capability Factor
UCLF	Unplanned Capability Loss Factor
QA	Quality assurance
QC	Quality Control
PCM	Process Control Manual
SAP	Systems, Applications and Programmes Software
BMS	Bulk Material Services
FGD	Flue Gas Desulphurisation
BOP	Balance of Plant (Outside Plant)
PA	Primary Air
FD	Forced Air
ID	Induced Draught
ITP	Item Test Plan
OHS&E	Occupational Health, Safety & Environment

2.5 Roles and Responsibilities

2.5.1 The Contractor

a) All Contractor employees shall comply with Eskom's policies and site regulations, adherence to Eskom's Life Saving Rules, adherence to Generation Occurrence Management Procedure, Smoking Policy, zero tolerance on alcohol usage, etc. These requirements will be detailed during the induction training process.

b) The number of staff required to execute the works is to be decided by the Employer and reviewed for recommendation of adjustment by the Contractor after his/her assessment of the scope of work and submitted to the Employer for approval.

c) The successful Contractor shall utilise/provide skilled and suitably qualified staff (in line with Eskom Job specifications) with current experience in the following but not limited disciplines.

i. Competent Maintenance Person according to OHS Act

ii. Occupational Health and Safety Act 85 of 1993

iii. NEC contract management

iv. Quality Management Control and Assurance procedures

v. Plant Safety Regulation authorisation

vi. Spares optimisation

vii. Plant optimisation and commissioning

iix. Procedure writing

ix. BOM compilation

d) Staff must meet minimum requirements of Eskom job descriptions, with additional requirements specified.

e) All staff brought onto site in connection with this SOW should be able to fluently speak, understand and write in English.

f) Proof of qualification is to be supplied on request by the Employer.

g) The Contractor ensures that all staff being brought to Kusile PS site have a valid fitness certificate based on the specified plant man-job specification.

h) The Contractor shall employ only careful, competent, and efficient persons in and about the works, and the Employer shall have the right to object to and require the Contractor to remove immediately any individual involved in the work who, in the Employer's opinion, misconducts themselves, or is incompetent or negligent in their duties. Such a person shall not be employed again on the works without the written permission of the Employer.

i) Provide daily supervision of all related plant activities through trained and competent personnel to ensure that inspections & work activities are conducted daily, including off-site inspections

j) Ensure proper behaviour of personnel under his/her supervision as per the Kusile culture.

k) Ensures the training of all personnel under his/her supervision. The training required will include, but not limited to, Eskom safety training requirements, related plant training, and Kusile culture.

l) Ensures high morale of staff and competency.

m) Ensures that throughout the duration of the contract, they conform to and adhere to the safety, health, and environment regulations as stipulated in the Kusile Maintenance URS.

n) A comprehensive risk assessment shall be done prior to any work being carried out

o) If a Permit to Work is required for working on plant and/or equipment, on completion of the work the relevant piece of plant/equipment shall be properly re-commissioned prior to the clearance of the Permit to Work.

p) The Contractor shall be responsible or held liable for any shortcomings arising from his/her activities within 7 days after an intervention, provided that the equipment has been placed into service.

q) The Contractor shall be held responsible or held liable for any defects arising from poor workmanship performed by their staff.

2.5.2 Management and Reporting

a) The type of reports, level of detail and frequency of reporting will be mutually agreed by the Employer and the Contractor during the contract negotiation phase of this agreement. These may change from time to time on request by the Employer.

b) The Contractor to be represented at agreed work-related meetings which may be daily, weekly, or monthly.

c) The Contractor to be represented at all Employer safety meetings.

d) The Contractor to be represented at any ad-hoc meetings that may arise to address any scope and safety related matters.

e) Liaison meetings shall be held with the Employer's Representative or his/her delegate on as and when required basis to discuss any technical details, or concerns.

2.5.3 Contractor's Management, Meetings and Key People

a. Before work starts on site, an inaugural meeting is held with the Contractor and the Employer, to explain in detail all requirements of the Site Regulations.

b. The Contractor is issued with a file of current Site Regulations on arrival. The file remains the property of the Employer and the Contractor is responsible for its maintenance and updating to include new or revised regulations as issued by the Employer.

c. The Contractor must ensure that all personnel operating mobile equipment and vehicles are authorised, this includes but not limited to.

i. Forklifts

ii. Mobile Cranes

iii. Cherry Pickers

iv. Truck Driver

v. Light Duty Vehicles

d. The Contractor shall be responsible for the regular inspections and daily equipment checks of the mobile equipment and vehicles including record keeping while onsite.

e. The Contractor must ensure that all personnel performing work on the plant are authorised, this includes but not limited to.

i. Confined space regulations

ii. Working at heights

iii. Heat stress areas

iv. Scaffolding Compliance (Not tempering with the scaffolding certified safe to be used)

v. Hazardous substances

vi. Hazardous locations

2.5.4 Communication and Correspondence

a. All correspondence includes but not limited to:

i. Kusile Power Station

ii. Employer's Contract number

iii. Contract description

iv. Correspondence subject matter

v. Employer's name and contact details

vi. Contractor contact details

vii. Date

b. Where appropriate the correspondence includes the Employer's reference and is delivered as a single package or as per the agreed contract terms.

c. All communications from the Contractor are numbered sequentially with a prefix as advised by the Employer. The Employer responds in like manner. The prefix and numbering system is decided upon at the Inaugural meeting.

2.5.5 Quality and Documentation Control

a. During the tender process a quality criterion will be defined that the Contractor must comply to.

b. The Contractor shall ensure that any witness, hold, and inspection points are strictly adhered to.

c. All Quality References and Standards as stipulated in this document will be adhered to.

d. The Contractor to comply with the Employer's quality documentation management system and processes.

2.5.6 Project Implementation

a. The Contractor shall supply an execution plan per deliverable including at least the following in Microsoft Project, Primavera or any other project planning tool acceptable to the Employer:

i. Site establishment

ii. Activities

iii. Manpower plan (Resource loaded)

iv. Organogram

v. Skills required and associated cost per skill (e.g. artisan, site manager, etc.)

2.5.7 Manpower Requirements

a. The number of personnel required to execute the works to be proposed by the Contractor after his/her assessment of the scope of work and submitted to the Employer for approval and shall be within the limits of the overall number of resources agreed on the contract.

b. The successful Contractor shall utilise/provide skilled and suitably qualified staff with experience in the technical aspects of this SOW and supporting teams.

c. All staff involved in this work scope should be able to speak, understand, and write in English fluently.

d. Proof of qualification is to be supplied on request by the Employer for specific key resources (Certified copies not older than three months).

e. The Contractor ensures that all staff being brought onto the Kusile site have a valid fitness certificate based on the specified plant man-job specification.

f. Provide daily supervision of all related work through trained and competent personnel to ensure that work activities are conducted as per execution SOW.

2.6 Process for Monitoring

a. The process will be agreed upon by both parties per Task Order and in accordance with Eskom process control manuals and the specific SOW.

2.7 Related/Supporting Documents

N/A

3. Detailed Scope of Work

The scope of work entails coordinating, controlling quality, and performing physical inspections on maintenance and outage activities at Kusile Power Station including off-site.

3.1 Works Information

a. Co-ordinate and control quality activities

b. Perform physical inspections on maintenance and outage activities

c. Input for procurement processes, evaluations, squad checks and site meetings

d. Interaction with all departments at Kusile Power Station

e. To give assurance of high-quality works on plant activities

f. To improve plant reliability and performance

g. Determine / recommend requirements for quality control inspections

h. Maintain acceptability of activities in maintenance

i. Provide professional advice and leadership on Quality Control issues

j. Raise a non-conformance notification against the service providers.

k. Contractor to understand Eskom's Quality Requirements and to be provided with Quality related Procedures.

l. All quality inspectors to have SAP PM training and access to check and do QC sampling on PM's

m. The *Contractor*'s personnel (Electrical, C&I, Turbine, Auxiliary, Outside plant / Mechanical and Welding Quality Inspectors) will be trained in Eskom Plant Safety Regulations (PSR) permit and Operating Regulations for High Voltage Systems (ORHVS) within 6 months.

n. Work Permit Risk Assessment Form must be completed before each task and workers' register to be filled in.

o. All Eskom required training will be provided by Eskom.

p. All personnel who enter the station must abide to Eskom rules and regulations and will comply with Eskom Life Saving rules.

q. All communications must be appropriately filed in *Service Manager's* file (Hardcopy or electronically).

r. Timesheets to be logged and signed by *Services Manager* and *Contractor*.

s. All PPE to be provided by *Contractor* and must be SABS approved.

t. All work to be done under permit to work.

u. Yearly induction and medical surveillance for all personnel must be maintained.

3.2 Co-ordinate and control quality activities

a. Review and approve quality control plans considering high priority defects, and spares availability etc.

b. Approve “stop work” orders if quality and safety standards are compromised.

c. Review and approve identified quality deficiencies with the support of system engineers and maintenance personnel.

d. Control the close-out of quality deficiencies by reviewing and approving initiatives, proposals, or corrective actions for improvements with the help of system engineers, maintenance personnel.

e. Prioritize activities for quality control verifications with the help from systems engineers and maintenance personnel.

f. Support and control QC processes by reviewing all documentation and system information and validate information to maintain accurate data

g. Perform / check / control job observations.

h. Clarify quality requirements during execution of a project/outage

i. Highlight the non-availability of Spares and lead times thereof

j. Identify new and highlight previous lessons learnt for a project/outage

k. Identify potential project/outage quality risks

l. Manage non-conformance and quality deficiencies closed-out

3.3 Perform physical inspections on Maintenance/Projects and Outage activities

a. Perform inspections and determine if standards are met. Identify and report non-compliances.

b. Recommend possible changes to maintenance standards or practices

c. Assess, monitor and report good and sub-standard work practices.

d. Verify that documentation conform to requirements and standards by reviewing work packages, maintenance plans, procedures, and modification packages according to the relevant administrative controls, Identify and report non-conformances.

e. Ensure adherence to procedures, work instructions, standards, and policies

f. QC Check all the work carried out by the service provider through intervention points

g. Attend outage meetings, perform inspections on components and verify outage data packs

3.4 Provide Professional advice and Leadership on QC Issues

a. Advice all service provider staff on queries and problems encountered in line with protocol and system administrators, engineers, and managers.

b. Recommend references for service provider staff when encountering quality related challenges

3.5 Employer's minimum resource skills requirements for the services

Table 1: Resourcing Skill Requirements Table

No	Resource	Minimum Qualification/Skill
1	**Site Manager/Supervisor for the Works**	a. Quality Management or Technical Degree with Quality management system experience in Power Station Maintenance with ISO 9001 exposure for 5 Years. b. Or Quality Management or Technical National Diploma with Quality management system experience in Power Station Maintenance with ISO 9001 exposure for 7 Years c. Or N6 National Diploma Technical with Quality management system experience in Power Station Maintenance with ISO 9001 exposure for 10 Years d. Member of relevant Professional Technical and/or Quality institute e. Certificate of any Quality related courses f. Knowledge of ISO 9001 quality management system g. Understanding and knowledge of Quality Management processes, systems, and practices h. Sound knowledge of Eskom Business processes i. Management or Supervisory training j. SAQA NQF Level 6 k. Knowledge of ISO 9001 l. Knowledge of OHS Acts m. Knowledge of QMS implementation / Audits n. Commissioning/Decommissioning experience.
2	**Electrical Quality Controller/Inspector for All Electrical equipment**	a. National Diploma in Electrical Engineering (Heavy Current) b. SAQA NQF Level 6 c. Knowledge of ISO 9001 d. Knowledge of OHS Acts e. Knowledge of QMS implementation / Audits f. 5 Years Heavy Industrial Experience of which a minimum of 2 years should be at a Power Station. g. 5 Years Electrical QC Inspector Experience – Reference with contact details needed. h. Quality Control sampling on PM's (Notification and Work Order processing) i. Certificates proving training and electrical statutory compliances, regulations and standards or exposure to i.e. (SANS, EN, BS, IEC, NEMA etc.) j. Commissioning/Decommissioning experience. - Reference with contact details needed. k. Added advantage: l. professional membership m. Knowledge or experience of Eskom quality processes n. Knowledge of safety and risk assessment

No	Resource	Minimum Qualification/Skill
3	**Control & Instrumentation Quality Controller/Inspector for All Control and Instrumentation plant areas**	a. National Diploma in Instrumentation Engineering (Light Current/C&I) b. SAQA NQF level 6 c. 3 years Heavy Industrial Experience, of which 2 years at a Power Station, 1 years Technician/Management Experience. d. DCS/SCADA/PLC experience. e. Commissioning/Decommissioning experience f. Quality Control sampling on PM's (Notification and Work Order processing) g. Added advantage: h. professional membership i. Knowledge or experience of Eskom quality processes j. Knowledge of safety and risk assessment k. Knowledge of pneumatics and hydraulics
4	**Turbo Generator Centreline, Turbine Auxiliaries and Valves Quality Controller/Inspector**	a. SAIW Welding and Fabrication Inspectors Level II b. N6 diploma and Trade Test certificate or National Diploma in Engineering c. Diploma or certificate in Total Quality Management d. Quality Management certificate e. Trade test in Fitting and machining f. 10 years post apprenticeship experience g. Of which 5 years should be power station experience. h. Must have 5 years Turbine and Generator inspection experience i. Should have experience in the overhauling of the turbine/generator j. Have experience in the overhauling of the following pumps, valves (H.P & I.P control valves, emergency stop valves), lube oil systems, oil pumps k. Should have experience in pressure testing of equipment l. Should be able to read micrometres (inside &outside micrometres) m. Should be able to work to very close tolerances of about(0.02mm) n. Should be able to use a clock gauge/ dial test indicator o. Should be able to check run outs on shafts p. Must be able to review scopes, generate or review PQP's q. Must be able to read engineering drawings r. Must be competent in conditioning monitoring i.e. vibration analysis, tribology, s. Must have knowledge of turbine maintenance philosophy t. Commissioning/Decommissioning experience u. Knowledge of pneumatics and hydraulics v. Knowledge of NCR processes w. Knowledge of ISO 9001

No	Resource	Minimum Qualification/Skill
5	**Boiler & Associated Auxiliaries Mechanical Quality Controller/Inspector**	a. SAIW Welding and Fabrication Inspectors Level II b. N6 diploma and Trade Test certificate or National Diploma in Engineering c. Diploma or certificate in Total Quality Management d. Engineering drawings interpretation e. 15 years post apprenticeship f. 10 years' experience in plant maintenance at supervisory level g. 5years chemical and water plant experience h. 10 years' experience in engineering quality control i. Knowledge of ISO 9001 processes and procedures j. Knowledge of supplier audits k. Knowledge of tender, supply, and procurement processes l. Cooling Water systems for Power plants m. Plant and equipment alignment (clock gauge/laser) n. Practical Machinery Vibration analysis & Predictive Maintenance o. Reliability centred maintenance p. Work management experience (SAP PM01 and PM02) q. Engineering change management r. 5Years RBO/MSMW experience s. ASME –Setting of Standards t. Root Cause Analysis u. Failure analysis v. Pump maintenance w. Gear box maintenance x. 10 years knowledge in compressor maintenance y. 10 years machine-shop experience with limits and fits z. Certificate in OHSE /SAMTRAC/NOSA/NEBOSH aa. Boiler Plant Operation bb. Deming Water plant Operation cc. Fluid Catalytic Cracking Unit Operation dd. Steam Generator Operation. ee. Fired Heater Operation. ff. Water Reticulation Plant operation gg. 10 years Power Station Experience hh. Knowledge of PSR ii. Valve maintenance experience jj. Corrosion protection experience kk. hydraulics and pneumatics ll. Commissioning/Decommissioning experience

No	Resource	Minimum Qualification/Skill
6	**FGD Unitised & FGD Auxiliaries Mechanical Quality Inspector**	a. SAIW Welding and Fabrication Inspectors Level II b. N6 diploma and Trade Test certificate or National Diploma in Engineering c. Diploma or certificate in Total Quality Management d. Engineering drawings interpretation e. 15 years post apprenticeship f. 10 years' experience in plant maintenance at supervisory level g. 5years chemical and water plant experience h. 10 years' experience in engineering quality control i. Knowledge of ISO 9001 processes and procedures j. Knowledge of supplier audits k. Knowledge of tender, supply, and procurement processes l. Cooling Water systems for Power plants m. Plant and equipment alignment (clock gauge/laser) n. Practical Machinery Vibration analysis & Predictive Maintenance o. Reliability centred maintenance p. Work management experience (SAP PM01 and PM02) q. Engineering change management r. 5Years RBO/MSMW experience s. ASME –Setting of Standards t. Root Cause Analysis u. Failure analysis v. Pump maintenance w. Gear box maintenance x. 10 years knowledge in compressor maintenance y. 10 years machine-shop experience with limits and fits z. Certificate in OHSE /SAMTRAC/NOSA/NEBOSH aa. Boiler Plant Operation bb. Deming Water plant Operation cc. Fluid Catalytic Cracking Unit Operation dd. Steam Generator Operation. ee. Fired Heater Operation. ff. Water Reticulation Plant operation gg. 10 years Power Station Experience hh. Knowledge of PSR ii. Valve maintenance experience jj. Corrosion protection experience kk. hydraulics and pneumatics ll. Commissioning/Decommissioning experience mm.

No	Resource	Minimum Qualification/Skill
7	**BOP, Coal, Ash & Limestone (BMS) Quality Inspector**	a. SAIW Welding and Fabrication Inspectors Level II b. N6 diploma and Trade Test certificate or National Diploma in Engineering c. Diploma or certificate in Total Quality Management d. Engineering drawings interpretation e. 15 years post apprenticeship f. 10 years' experience in plant maintenance at supervisory level g. 5years chemical and water plant experience h. 10 years' experience in engineering quality control i. Knowledge of ISO 9001 processes and procedures j. Knowledge of supplier audits k. Knowledge of tender, supply, and procurement processes l. Cooling Water systems for Power plants m. Plant and equipment alignment (clock gauge/laser) n. Practical Machinery Vibration analysis & Predictive Maintenance o. Reliability centred maintenance p. Work management experience (SAP PM01 and PM02) q. Engineering change management r. 5Years RBO experience s. ASME –Setting of Standards t. Root Cause Analysis u. Failure analysis v. Pump maintenance w. Gear box maintenance x. 10 years knowledge in compressor maintenance y. 10 years machine-shop experience with limits and fits z. Certificate in OHSE /SAMTRAC/NOSA/NEBOSH aa. Boiler Plant Operation bb. Deming Water plant Operation cc. Fluid Catalytic Cracking Unit Operation dd. Steam Generator Operation. ee. Fired Heater Operation. ff. Water Reticulation Plant operation gg. 10 years Power Station Experience hh. Knowledge of PSR ii. Valve maintenance experience jj. Corrosion protection experience kk. hydraulics and pneumatics ll. Commissioning/Decommissioning experience

No	Resource	Minimum Qualification/Skill
8	**Welding Quality Controller/Inspector for all plant areas**	a. SAIW Welding and Fabrication Inspectors Level II b. IIW International Welding Inspector Comprehensive (IWI - C) c. IIW International Welding Inspector Standard (IWI – S) d. In depth knowledge of ISO 9001:2008 Implementation /Internal Audit e. In depth knowledge of receiving and Inspections on all plates, pipes, and tools components. f. In depth knowledge of OHS Act. g. Experience and good knowledge of scope of work reviews. h. Review of QCP's, Verification of Drawings and Materials. i. Verification marking out of cut lines as per Engineering Instructions. j. Verification of NDT reports and procedures. k. Verification of consumables. l. Witnessing of fit-ups, root runs and weld contour. m. Verify welding procedures and welding qualifications. n. Control of deviation through NCR / PIR procedures. o. Final inspection data book reviews and release. p. In depth knowledge of all welding design, inspections, and testing Codes / Specifications relevant to the Power Generation industry. q. Witnessing of pressure and leak tests. r. SAMTRAC is added advantage s. Red seal welding certificate is an added advantage
9	**Safety Officer & Quality Administrator for the works**	a. Relevant Bachelor's degree with 2 Years' Experience or, b. Relevant National Diploma with 3 Years' Experience or, c. Relevant B-Tech with 3 Years' Experience d. Sound knowledge of Safety Risk processes, systems, and practices e. Sound knowledge of business processes f. Sound knowledge of budgetary process g. Analytical skills h. Interpersonal skills i. Data base programming manipulation skills (PC based on SAP HR)

3.6 Employer's minimum resource functional outputs

Table 2: Resourcing Skill Functional Outputs Table

No	Resource	Minimum Functional Outputs
1	**Site Supervisor for the Works**	1. Quality management (QMS) 2. Personnel management 3. Audit management 4. Measurement, Analysis, and Improvement of Quality performance 5. Reporting

No	Resource	Minimum Functional Outputs
2	**Discipline Quality Controller/Inspector**	1. Perform general inspections during maintenance and repairs to plant and check that: 1.1 Work complies with the preventive maintenance plan. 1.2 Breakdown maintenance is performed as per deviation procedure. 1.3 Fault-finding activities on all equipment and implementation of corrective measures are conducted to the same quality standards. 1.4 Check that all maintenance activities are conducted in accordance with all standards, procedures, and instructions. Identify, report deviations, and recommend corrective actions. 2. Conduct quality control inspections on tasks performed 2.1 Witness, inspect or check tasks at the applicable hold points as indicated on the QCP, ITP or PM. 2.2 Issue non-conformance report when required with corrective actions stipulated. 2.3 Revise tasks, work procedures, quality standards or hold points to ensure continual improvement. 3. Develop/Assist in development of: 3.1 Quality control procedures, standards, work instructions etc. 4. Provide advice to persons performing work to attain desired quality of work. 5. Investigate recurring defects to determine root cause of failure related to quality assurance and recommend corrective actions. 6. Check that spare parts meet the quality requirements. 7. Provide evidence on request that conformance to quality requirements are met.
3	**Safety Officer & Quality Administrator for the works**	1. Facilitate multi-functional disciplinary work groups to compile risk specific Occupational Safety, Health and Environmental (OHS&E) risk assessments & audit processes 2. Implement, enhance, and maintain OHS&E programs within the parameters of legal requirements, ISO, OHSAS & best practice 3. Provide professional advice and guidance on OHS&E 4. Analyse and assess the business needs with respect to Occupational Hygiene risks, implement and monitor control measures 5. Develop and implement SHS&E audits 6. Compile accurate projections on the integrated safety risk and ensure legislative and business risks created by accidents are managed 7. Develop and advice on implementation and evaluating the lifecycle of risk management processes and projects 8. Development, implementation and monitoring of OHS&E standards and procedures

3.7 Applicable Plant Areas

Table 3: Plant Area Breakdown

Plant Area	Plant Area	Sub System
Turbine Plant	Condensate System	LD Condensate Polishing and resin transfer
		LCA Main Condensate system
		LCB Condensate extraction
		LCC Condensate LP heaters
		LCJ LP heater drains
		LCP Condensate Reserve System
		LCE LP Injection System (Spray water)
		LAD Feedwater Heating LP Heaters
	Cooling Water System	PC Open Cooling Water System
		PG Closed Cooling Water System
	Feedwater System	LCH HP heater drains
		LAA Feedwater tank and de-aeration
		LAB Feedwater piping system
		LAC Feedwater pumping system
		LAD feedwater heating HP heaters
		LAE HP Bypass water injection system
	Turbine Centreline	MAA HP Turbine
		MAB IP Turbine
		MAC LP Turbine
		MAD turbine bearing monitoring
		MAL Drains, LP bypass system,
		MAN, IP Turbine Bypass
		MAV Lub and jacking oil supply
		MAW gland steam and casing heating
		MAX Control and hydraulic oil system
		MVA Lub oil storage and regeneration
		LAF IP water injection system
	Air Cooled Condenser (ACC)	MAG Turbine exhaust and ACC system
		LCM ACC drain pumps, TCT, ACCCT, LDFT, TDFT
		MAJ Air Evacuation System
	Generator and Auxiliaries	Generator
		Seal oil
		Stator cooling
		H2 plant
	Condensate System	Extraction steam System (Cold reheat steam, HP bled steam LBQ, LP bled steam LBS)

Plant Area	**Plant Area**	**Sub System**
		Forced cooling MPR
Compressors	Low Pressure (LP) Services	QF Compressed air production storage and supply
		SG Fire protection (Fire Fighting and Floor Washing Water Supply System)
Hydrogen	Hydrogen	QG Hydrogen generation, storage, and supply
BMH	Mixed Ash Plant	ETK Mixed ash Conveying and conditioning
		ETS Ash Stacking, spreading, and reclaiming system
	Bottom Ash Removal	ETA Coarse Ash Conveyor
		ETD Degritting Sump
		HDA Submerged Scraper Conveyor
	Coal Plant	EA Coal unloading & storage
		EC Coal distribution and unit storage system
	Dust Handling Plant	ETH Fly Ash silo
		ETP Silo aeration and conveying air.
		ETG Dust Handling Plant
		ETP Pneumatic Conveying Air
FGD	FGD Common Plant Auxiliaries	Rapid Drain System
		Rapid Drain Area Sump and Pumps System
		Make Up Mist Eliminator Water Tanks
		Process Air Distribution System
		Service Air Distribution System
		Instrument Air Distribution System
		Fire Fighting Floor Washing Distribution Common System
		Holding Recycle Dam Raw Water System
		Raw Water Distribution Common
		Cooling Water Distribution Common System
	FGD Dewatering Plant	Filter Feed Tanks
		Primary & Secondary Dewatering Systems
		FGD Blowdown Tanks
		Dewatering Area Sump & Pumps
		Gypsum Conveying System
	FGD Reagent Preparation Plant	HTK Reagent Storage System
		HTK Reagent Preparation System
		HTK Ball Mill Lube System
		HTK Air System for Ball Mill Clutches
		HTK Reagent Distribution System
		HTK Reagent Preparation Area Sump and Pumps System
		HTK Distribution Area Sump and Pumps System

Plant Area	Plant Area	Sub System
		HTK Limestone Conveying System
Water Treatment Plant and Dams	Water Treatment Plant	GK Potable production
		GA Raw water supply and storage
		GC Demin production
		GK Potable storage & reticulation
		GC Demin storage and reticulation
		LCL Condensate Return
		GR Sewage Treatment Plant
		GTA Treated effluent Reticulation and storage
		GQ Sewage collection and pumping system
		Primary & Secondary clarification treatment works (DD, CD PC dams)
		GN Drain water dosing system
		GU Terrace Drainage pumping system
Boiler	Flue Gas cleaning	HP Fabric Filter Plant
	Boiler pressure parts	HAC Economiser
		HAD Evaporator
		HAG Boiler Circulation system
		HAH Superheater system
		HAJ Reheating system
		HAN pressure part drain vent and bypass system
		HB Boiler structure, casing, and combustion chamber
		LCL Boiler Condensate Blowdown
		HC Soot blowing system
	Draught Group	HFE PA Fans
		HLB FD Fans
		HNC ID Fan
		HLD Flue Gas Air Heater
		HLC Steam preheater
		HLA Secondary air ducting
		HFE Primary air ducting
		HNA Flue gas exhaust ducting
		HNE Smokestack (Flue gas Ducting)
	Milling Plant	HFA Coal bunker
		HFB Feeder system
		HFC Pulverising system
		HFE Mill Air
		HFW Seal Air Fan
	PF System and Burners	HHA main burners
		HHE PF conveying and distribution

Plant Area	Plant Area	Sub System
		HHL boiler burner air
		HJA light up burners
		HJM Atomising Steam
		HJQ Burner and scanner cooling air
	Steam Piping System	LBA Main steam piping
		LBB Hot Reheat
		LBC Cold reheat
		LBF HP bypass
		LBG Auxiliary steam piping
		LBH Start-up steam system
Auxiliary Boiler	Auxiliary Boiler	Auxiliary Boiler LP Gas
		Auxiliary Boiler Fuel Oil
		Auxiliary Boiler

3.8 Skill Resourcing Quantities

Full-time based resources

1. Site Supervisor – (1)
2. Safety Officer - 1
3. Quality Controller (Electrical Trade)-(2)
4. Quality Controller (C&I Trade) – (2)
5. Quality Controller (Turbine Mechanical Trade) – (1)
6. Quality Controller (Boiler Mechanical Trade) - (1)
7. Quality Controller (FGD Mechanical Trade) - (1)
8. Quality Controller (C&A, BOP, Limestone Mechanical Trade) - (1)
9. Quality Controller (Welding Trade) - (1)

3.9 Deliverable Reports

The table below detail the minimum reports that will be required at the indicated frequencies

Table 4: Deliverables Reports Table

No	Deliverable	Frequency	Format
1	Documentation that verifies that the work performed meets the minimum standards established by the specifications.	Every task	Electronic (Microsoft Office & Adobe)
2	Monthly activity reports to indicate their involvements in the daily running of the power station and interface with the relevant department	Monthly	Electronic (Microsoft Office & Adobe)
3	Monthly presentation to management on continual improvement and area of concern/risks. Strive to minimise rework and save cost	Monthly	Electronic (Microsoft Office & Adobe)
4	Conduct and Provide report on all service provider quality internal Audits	Quarterly	Electronic (Microsoft Office & Adobe)