

PART 3: SCOPE OF WORK

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C3.1: EMPLOYER’S SCOPE

C3.1: *Employer Scope of Work*

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1 Description of the services

1.1 Executive overview

The purpose of this contract is to acquire services with regards to Condition Monitoring/Technical Support, Commissioning, Production, HMI design and implementation, and Technical and Prism support for the RMDC (Remote Monitoring and Diagnostic Centre) in the Eskom Middelburg offices. In total, the number of resources required is 6. This Service will commence in March 2022 for a period of 3 (three) years which will be annually reviewed on an if-and-when required basis. The contractor will be informed three months before if the contract will be renewed or not. To provide the required service the following is required:

1.1.1 Two Condition Monitoring/Technical Support service with minimum requirements N6-National Technical Diploma and five years power plant experience.

1.1.2 One Production Support service with minimum requirements N6 -National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification experience

1.1.3 One Commissioning Support service with minimum requirements N6- National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification commissioning experience

1.1.4 One Technical and Prism Support service with minimum requirements N6-National Technical Diploma and five years power plant experience

1.1.5 One HMI (Human Machine Interphase) and OT/IT (Operating Technology and Information Technology) Support with minimum requirements National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification HMI design and PI Process Book experience

1.2 Interpretation and terminology

The following abbreviations are used in this Scope:

Abbreviation	Meaning given to the abbreviation
ECSA	Engineering Council of South Africa
OU	Operating Unit
RMDC	Remote Monitoring and Diagnostic Centre
PSR	Plant Safety Regulations
PFFR	Pulverized Fuel Firing Regulation
ORHVS	Operating Regulation for High Voltage system
INO	Initial Notification of Occurrence
UCLF	Unplanned Capability Loss Factor
RTS	Return to Service
EIT	Engineer in Training
CRA	Concept Release Approval
DRA	Design Release Approval
ERA	Execution Release Approval
HMI	Human Machine Interface



LOPP	Life Of Plant Plan
SOW	Scope of Work
PM	Plant Maintenance
NQF	National Qualification Framework
EPPEI	Eskom Power Plant Engineering Institute
NOx	Nitrogen Oxide
EtaPRO	Online Heat Rate Monitoring
OSIsoft	Data Historian Service Provider
PI Processes Book,	Data Display and Retrieval
AF Alarming	PI Alarming Engine
SVG	Scalable Vector Graphics
PRiSM	Online Condition Monitoring
STEP	Station Thermal Efficiency Program
OT	Operational Technology
IT	Information Technology
w.r.t.	With respect to
PF	Pulverised Fuel

2 Specification and description of the services

2.1.1 Two Condition Monitoring/Technical Support service to RMDC Middelburg (minimum requirements National Diploma Technical and five years' after qualification technical support experience)

The Advisor station support Service Scope of Work shall encompass the following deliverables:

ENSURE REAL TIME HEAT RATE AND CONDITION MONITORING

- Ensuring that Heat Rate and Condition Monitoring is established across multiple stations
- Ensuring that good Remote Monitoring Principles are adhered to.
- Advising the stations on corrective actions to increase reliability where the plant is operating out of norm and drive these actions through relevant and appropriate platforms.
- Ensuring that all relevant modules are established within the RMDC to realise the full potential of the Heat Rate and Condition Monitoring packages
- Advising stations on corrective actions to increase efficiency where plant is operating out of norm.
- Advising stations on Long Term Plant damage which may occur if design specifications are exceeded.
- Designing effective Heat Rate and Condition Monitoring modules to ensure increased efficiencies together with predictive monitoring capability.



The provision of critical resources required to support for the RMDC (Remote Monitoring and Diagnostic Centre)

REVIEW CRITICAL PLANT OPERATIONS, PHILOSOPHIES AND DEVELOP EFFECTIVE WORKS METHOD WHERE DEFICIENCIES OCCUR BY:

- Checking that all plant parameters conform to set operating standards
- Advising of safe operating parameters in accordance with Heat Rate and Condition Monitoring analysis.
- Monitoring all major plant during commissioning and advising engineering and production on acceptance. Compiling and issuing recommendations to correct any deviations as required and documented accordingly.
- Station Alarm monitoring and mitigations put in place to eliminate risks.

ASSISTING WITH TRIP REDUCTION AND ROOT CAUSE ANALYSIS BY:

- Making recommendations with regard to resolutions to prevent re-occurrence of incidents by making use of RMDC root cause analysis report.
- Trip Reduction Support reports are compiled and updated and the station trip reduction forums attended to further assist and advise the station.
- Making use of Trend Design to determine Direct Cause, Root Cause and Sub Causes of each significant load loss.

ENSURING LTPH (LONG TERM PLANT HEALTH) LIFE CYCLE BY:

- Advising on corrective actions to rectify long term plant health parameters that have been exceeded.
- Monitoring Life Time Plant health indicators with predictive monitoring capability within the RMDC
- Liaising with the relevant specialist or platforms to create awareness of any LTPH indicators that are exceeded on a real time basis.

2.1.2 Production Support services to RMDC Middelburg (minimum requirements National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification experience)

The Production Service *Scope of Work* shall encompass the following deliverables:

- Remote monitoring of all power Stations
- Advise stations to reduce or mitigate risks of any abnormal operating parameters
- Analyse results from predictive monitoring equipment and advise Operating, Engineering and Maintenance at stations as to any operating risks
- Alert power stations if any Plant Safety Regulations (PSR), Pulverized Fuel Firing Regulation (PFFR), and Operating Regulation for High Voltage system, ORHVS are operated out of norm
- Assist stations with plant operational trouble shooting
- Compile INO for all major UCLF and Trip incidents identified in the RMDC
- Advise as to best practice/methods of start-up of RTS plant during light-up and other conditions
- Monitor and advice on capability testing to ensure safe and reliable unit operations by production during capability testing
- Assist production departments by giving early warning of any risks on any plant before synchronization
- Perform normal Operating routines such as shift logs, shift handover reports, shift communication and other shift responsibilities
- Produce business requirements, weekly and monthly report documents

2.1.3 Commissioning Support service to RMDC Middelburg (minimum requirements National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification commissioning experience)

The Commissioning Service *Scope of Work* shall encompass the following deliverables:

- Design critical pre and post outage performance parameters
- Analyse and advise on achieving successful capability testing
- Review commissioning scope of work including inputs from relevant departments



The provision of critical resources required to support for the RMDC (Remote Monitoring and Diagnostic Centre)

- Transfer of personal technical skills, knowhow, information and experience to trainee engineers, operating, and technical personnel in order to improve the organizations technical knowledge base
- Advise and assist with commissioning after any Design, Systems interfaces and Control Philosophy changes
- Interfaces with the Discipline Engineers to share ideas, reasons, etc. on improving engineering capability pre and post outage
- Advise as to the alignment of the commissioning programme with project and production plan
- Assist the outage and construction manager with commissioning and hand-over of plant
- Reviews and witnesses that tests are being executed according to commissioning procedures
- Evaluates pre-commissioning status before commissioning activities of plant commences
- Provide Engineering proposals, and alternative methods to optimise project plans towards achieving the project due dates.

2.1.4 Technical and Prism Support service (minimum requirements National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification experience)

The Condition Monitoring Service Scope of Work shall encompass the following:

- Implementation of PRiSM model as per defined scope
 - Create/Review Point List
 - Create Templates
 - Build Models
 - Test Models
 - Fine Tune Models
 - Create Annunciator Panels or watch lists
- Conduct Alarm Analysis and Management
 - Review PRiSM alarms
 - Retrain models or flag potential issues
 - Use RMDC systems to track and report issues to RMDC technical advisors.
 - Create log entry or assistance entry to track each case
- Reporting
 - Create weekly/monthly reports
 - Provide Assistance, Support and User Training to RMDC personnel when required
 - Fault Reporting
 - Track and report should signals or systems not being updating or in service.

2.1.5 HMI Advisor (Human Machine Interphase) and OT/IT (Operating Technology and Information Technology) Support with minimum requirements National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification HMI design and PI Process Book experience

The HMI design Service Scope of Work shall encompass the following deliverables:

- Design and implement HMI interface graphics for RMDC (Remote Monitoring and Diagnostic Centre) the IGCC, Engineering and Power Stations as required
- Develop monitoring models for RMDC
- Develop specialized screens as requested by the power station and approved by RMDC management
- Development of calculations and performance equations as needed or requested by RMDC technical support department.
- PI Process Book design and implementation



The provision of critical resources required to support for the RMDC (Remote Monitoring and Diagnostic Centre)

- Leading role w.r.t. OT and IT integration in RMDC
- Manage OSIsoft and PI security and system administration
- Alarming support within PI Process book for all developed screens
- Generate reports as required with regards to OT/IT signal integrity
- Resolving Signal integrity. Signal unreliability or unavailability is a major risk to the operations within the RMDC and IGCC
- Provide Pi admin and development Training to RMDC and Station staff

2.2 Stage 2 Concept**Specific Service Deliverables**

Past experience shows that the service is typically but not exclusively delivered by:

Two Condition Monitoring/Technical Support service with minimum requirements N6-National Technical Diploma and five years power plant experience.

One Production Support service with minimum requirements N6 -National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification experience

One Commissioning Support service with minimum requirements N6- National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification commissioning experience

One Technical and Prism Support service with minimum requirements N6-National Technical Diploma and five years power plant experience.

One HMI (Human Machine Interphase) and OT/IT (Operating Technology and Information Technology) support service with minimum requirements N6-National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years' after qualification HMI design and PI Process Book

Note:

1. An hourly rate per resource type for services 1 – 6 is required.
2. Not all services will be required for the full 3 year contract period –see point **3.2 Consultant's Key Persons**
3. Eskom will require CV's and proof of qualifications and experience within the power station environment. (Individuals with past Eskom experience is preferred)
4. Eskom will attend interviews if it might be required.

Shift allowance of 15% should be indicated separately and will be applicable to the Remote Monitoring 24/7 shift worker only.

Overtime:

Overtime is applicable at a flat rate and only in emergency circumstances. The contractor resources to adequately comply with the basic conditions of employment act with regards to working times and rest period for the duration prescribed by the task orders.

Accommodation:

It will be required to travel and "sleep out" from time to time. A living out rate is required as per Pricing Data

Traveling:

There will traveling required and a travel rate per kilometer is required as indicated in Pricing Data



3 Constraints on how the *Consultant* Provides the Services.

3.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Employer's Agent* as follows:

Meetings of a specialist nature may be convened as specified elsewhere in this Scope or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *services*. Records of these meetings shall be submitted to the *Employer's Agent* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

The following table below is such meetings that can occur but not limited to:

Title and purpose	Approximate time & interval	Location	Attendance by:
Team Meetings	Three days a week as long as Covid 19 lock down restrictions in place or as when required	MS Team or RMDC board room TBA	Employer, Contractor and designated representative
Safety Meeting	Monthly	MS Team or RMDC board room TBA	Employer, Contractor and designated representative
Risk register and compensation events	As and when required	MS Team or RMDC board room TBA	Employer, Contractor and designated representative
Work Stoppages	As and when required	MS Team or RMDC board room TBA	Employer, Contractor and designated representative
Overall contract progress and feedback	As and when required	MS Team or RMDC board room TBA	Employer, Contractor and designated representative
Assessment, KPI's and monthly RMDC performance	As and when required	MS Team or RMDC board room TBA	Employer, Contractor and designated representative

3.2 Consultant’s key persons

Required Core Crew and Temporary team on an as and when required basis					
Designation	Two Condition Monitoring/ Technical Support service	One Production Support Service	Commissioning Support Service	Technical and Prism Support service	Advisor HMI (Human Machine Interphase)
Number of	two	one	one	one	one
Special requirement	Full-time on site	Full-time on site	Full Time on site	Full-time on site	Full-time on site
Qualifications	N6-National Technical Diploma and five years power plant experience.	N6 -National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years’ after qualification experience	N6- National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years’ after qualification commissioning experience	N6-National Technical Diploma and five years power plant experience	N6-National Diploma Technical / NQF 5 (Fossil Power Plant Process Control) and five years’ after qualification HMI design and PI Process Book
Experience	Minimum of 5 years of Related Experience	Minimum of 5 years of Related Experience	Minimum 5 years’ after qualification commissioning experience	Minimum of 5 years’ after qualification related experience	Minimum 5 five years’ after qualification HMI design and PI Process Book related experience

3.2.1 Strike and Industrial Action

The *Contractor* ensures that the contracted service is performed regardless of strike and industrial action.

3.2.2 Police clearance

- A) All *Contractor* personnel to undertake Police clearance. Certificates to be provided to the services manager before work commence.
- B) The *Service Manager* reserves the right to refuse entry to all persons whose criminal records indicate that their presence on site might create an unsafe and insecure environment to Kendal Power Station.
- C) The following website can be used to guide the process. http://www.saps.gov.za/services/applying_clearance_certificate.php

3.3 Provision of bonds and guarantees

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Consultant* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Consultant* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Consultant* by the *Employer’s Agent* to receive and accept such bond or guarantee. Such withholding of payment due to the *Consultant* does not affect the *Employer’s* right to termination stated in this contract.



3.4 Documentation control and retention

3.4.1 Identification and communication

All communications from the *Consultant* carry the contract number and title and is numbered sequentially on the basis of the communication source. The Employer responds in likely manner, numbering communications.

Note: All correspondence headings include:

- RMDC
- The Contract or order description
- The Employer's contract or order number
- The correspondence subject matter

3.4.2 Retention of documents

Clause 13.6 states that the *Consultant* retains copies of drawings, specifications, reports and other documents which record the *services* in the form stated in the Scope. Note the time period for which the *Consultant* is to retain such documents is the *period for retention* stated in the Contract Data.

3.5 Records and forecasting of the Time Charge

The consultant keeps records of each and every component, including the salaries of the people they are employing.

3.6 Invoicing and payment

Clause 50.2 states invoices submitted by the *Consultant* include the details stated in the Scope to show how the amount due has been assessed. Also state what must be shown on the Invoice. The following text is suggested.

The following details shall be shown on or attached to each invoice to show how the amount due has been assessed:

The *Consultant* shall address the tax invoice to:

Eskom Holdings Ltd (Find Out)
 Remote Monitoring & Diagnostic Centre (RMDC)
 RMDC Offices Corner of Jeppe and Verdoorn Street Middelburg, Mpumalanga
 Middleburg

The following information will be included on each invoice:

- Name and address of the *Consultant* and the *Employer's Agent*;
- The contract number and title;
- *Consultant's* VAT registration number;
- The *Employer's* VAT registration number 4740101508;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

All invoices are to be submitted to the *Employer's Agent*.

Payment will be made electronically 30 days after assessment and receipt of a valid invoice.

If Cost Price Adjustment implementation (CPA) is applicable, the *Employer's Agent* and the *Consultant* must confirm the increase/decrease with the QS (Quantity Survey) department BEFORE the revised prices are stated on the Invoice. The QS and *Employer's Agent* must confirm the escalation with the Financial Department before it may be implemented.

NB: If there is CPA indicate in the invoices should always be separate to effect payments while CPA calculations are being concluded.



3.6.1 Invoice price versus order price

It is important that the value stated on the Invoice must be the same as the value stated on the Task Order and contract. If the Invoice value is different from the Order or contract, payment of the invoice will be delayed. It is strongly recommended that if there are any discrepancies on the Invoice, it be rectified between the *Consultant* and the *Employer's Agent* before it is submitted for payment.

3.7 Inclusions in the programme

The *Consultant* provides a programme for specific tasks given to him as requested by the Employer. The *Consultant* is required to attend interface meetings with others to establish possession and sectional Completion dates for those items as detailed in the task order.

3.8 Quality management

3.8.1 System requirements

The *Consultant* to provide a quality statement and quality plan, which complies with requirements, stated in the QM-58.

3.9 The Parties use of material provided by the *Consultant*

3.9.1 *Employer's* purpose for the material

Clause 70.1 states that the *Employer* has the right to use the material provided by the *Consultant* for the purpose stated in the Scope.

3.9.2 Transfer of rights if Option X 9 applies

Refer to option X9

3.10 Health and safety

The *Consultant* shall at all times comply with the health and safety requirements prescribed by law as they may apply to the *services*.

The *Consultant* may be required to work on Eskom premises, such as a power station, where health and safety requirements additional to those prescribed by law apply, the consultant shall comply with the health and the safety requirements contained in the Contractor health and Safety Requirements 32-136. The contractor complies with the occupational Health and Safety Act and Regulations, 1993 and all regulations made there under as well as the Employers Safety and operating procedures. Other than the above mentioned consultant is to complete Construction Regulation 37(2)

3.11 Procurement

3.11.1 BBBEE and preferencing scheme

BBBEE status will be part of weighted tender evaluation process prior to contract award.

3.12 Correction of Defects

Refer to clause 41.2

3.13 Working on the *Employer's* property

Refer Contractor Health and Safety Requirements 32-136

3.14 Cooperating with and obtaining acceptance of Others

- 1) Refer clause 23.1 for cooperation with others and refer to 11.2(7) for the definition of others.
- 2) Requirements for liaison with and acceptance from statutory authorities or inspection agencies



3.15 Things provided by the Employer

Provide details of any facilities and equipment made available by the Employer for the Consultant's use during performance of the services. State any conditions relating thereto.

Facilities supplied by Employer	Description
Access	It is critical that access is provided by the employer to all relevant areas. Furnished offices for use by the consultant are supplied by the employer. Access to Eskom outlook, Intranet and internet.
Communication Infrastructure	The ability to maintain on-going contact with the consultant and employer's teams during working hours is imperative to successful coordination of the project activities. For this to occur in a cost effective manner, the availability of a telephone, fax and e-mail is supplied by the employer.
Consumables	All consumables in line with providing the service on site

4 List of drawings

4.1 Drawings issued by the Employer

This is the list of drawings issued by the Employer at or before the Contract Date and which apply to this contract.

Drawing number	Revision	Title
N/A		

C3.2: Engineering Service Scope of Work