NEC3 Engineering & Construction Contract

Between **ESKOM HOLDINGS SOC Ltd**
(Reg No. 2002/015527/30)

and **[Insert at award stage]**
(Reg No. _____)

for **Plant Information System Replacement**

Contents:		**No of pages**
Part C1	**Agreements & Contract Data**	**[●]**
Part C2	**Pricing Data**	**[●]**
Part C3	**Scope of Work**	**[●]**
Part C4	**Site Information**	**[●]**

CONTRACT No. **[Insert at award stage]**

Part C1: Agreements & Contract Data

Contents:		No of pages
C1.1	Form of Offer and Acceptance	[●]
C1.2a	Contract Data provided by the *Employer*	[●]
C1.2b	Contract Data provided by the *Contractor*	[●]
C1.3	Proforma Guarantees	[●]

C1.1 Form of Offer & Acceptance

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

Plant Information System Replacement

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

Options B	The offered total of the Prices exclusive of VAT is	**R [●]**
	The first forecast of the total Defined Cost plus the Fee exclusive of VAT is	**R [●]**
	Sub total	**R [●]**
	Value Added Tax @ 15% is	**R [●]**
	The offered total of the amount due inclusive of VAT is[1]	**R [●]**
	(in words) **[●]**	

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s) .....

Name(s) .....

Capacity .....

For the tenderer: .....

(Insert name and address of organisation)

Name & signature of witness ..... Date .....

Tenderer's CIDB registration number (if applicable) .....

[1] This total is required by the *Employer* for budgeting purposes only. Actual amounts due will be assessed in terms of the *conditions of contract*.

Acceptance

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the Employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Works Information
Part C4	Site Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy signed between them of this document, including the Schedule of Deviations (if any).

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s)		
Name(s)	Thozama Gangi	
Capacity	General Manager Medupi Power Station	
for the Employer	Eskom Holdings SOC Limited Medupi Power Station Steenbokpan Road Lephalale 0555 *(Insert name and address of organisation)*	
Name & signature of witness		Date

Note: If a tenderer wishes to submit alternative tenders, use another copy of this Form of Offer and Acceptance.

Schedule of Deviations to be completed by the *Employer* prior to contract award

Note:

1. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1	**[●]**	**[●]**
2	**[●]**	**[●]**
3	**[●]**	**[●]**
4	**[●]**	**[●]**
5	**[●]**	**[●]**
6	**[●]**	**[●]**
7	**[●]**	**[●]**

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

	For the tenderer:	**For the Employer**
Signature	.....	.....
Name	.....	Thozama Gangi
Capacity	.....	General Manager
On behalf of	.....	Medupi Power Station Eskom Holdings SOC Ltd Steenbokpan Road Lephalale 0555
Name & signature of witness	.....	.....
Date	.....	.....

C1.2 ECC3 Contract Data

Part one - Data provided by the *Employer*

[Instructions to the contract compiler: (delete these two notes in the final draft of a contract)

1. Please read the relevant clauses in the conditions of contract before you enter data. The number of the clause which requires the data is shown in the left hand column for each statement however other clauses may also use the same data.

1. Some ECC3 options are always selected by Eskom Holdings SOC Ltd. The remaining ECC3 options are identified by shading in the left hand column. In the event that the option is not required select and delete the whole row. Where the following symbol is used "**[●]" -** data is required to be inserted relevant to the specific option selected.]

Completion of the data in full, according to the Options chosen, is essential to create a complete contract.

Clause	Statement	Data
1	**General**	
	The *conditions of contract* are the core clauses and the clauses for main Option	**A: Priced contract with activity schedule**
	dispute resolution Option	**W1: Dispute resolution procedure**
	and secondary Options	**X1: Price adjustment for inflation**
		X2 Changes in the law
		X5: Sectional Completion
		X7: Delay damages
		X16: Retention
		X18: Limitation of liability
		Z: *Additional conditions of contract*
	of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)	
10.1	The *Employer* is (Name):	**Eskom Holdings SOC Ltd (reg no: 2002/015527/30), a state owned company incorporated in terms of the company laws of the Republic of South Africa**
	Address	**Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg**
10.1	The *Project Manager* is: (Name)	**Maletsatsi Koka**

	Address	**Medupi Power Station, Steenbokpan Road, Lephalale, 0555**
	Tel	**014 762 6143**
	Fax	**N/A**
	e-mail	**motswema@esom.co.za**
10.1	The *Supervisor* is: (Name)	**TBA**
	Address	**TBA**
	Tel No.	**TBA**
	Fax No.	**TBA**
	e-mail	**TBA**
11.2(13)	The *works* are	**Plant Information System Replacement**
11.2(14)	The following matters will be included in the Risk Register	• **Adverse weather conditions (Rain, Wind, Heatwave and Hailstorm).** • **Labour strike and community unrest.** • **Earthworks planning need to take into consideration the rain.** • **Normal Construction hazardous working with machinery.** • **Procurement (lead time)** • **Substantial Procurement of material when required.** • **Security of equipment, material and resource.** • **Access constraints and interfaces with others.** • **Interface and integration of works with the running plant and other Contractors.** • **Disease outbreak impact on labour force.** • **Plant access from other Contractors.** • **Working at Heights.** • **Hazardous Gas.** • **Electrocution.** • **Power supply interruptions or failure.** • **Interface and integration of the works with the running plant and other Contractors.** • **Dehydration (hot weather conditions).** • **Ash dust.** • **Fire and Smoke** • **Snakes** • **Any other risk identified during the execution of the works will be updated on the risk register.**

11.2(15)	The *boundaries of the site* are	**As defined in section 5.1.11 of Part C3 – Works Information**
11.2(16)	The Site Information is in	**Part 4: Site Information**
11.2(19)	The Works Information is in	**Part 3: Scope of Work and all documents and drawings to which it makes reference.**
12.2	The *law of the contract* is the law of	**the Republic of South Africa**
13.1	The *language of this contract* is	**English**
13.3	The *period for reply* is	**Five (5) working days for all communications and ten (10) working days for Design Reviews**
2	**The *Contractor's* main responsibilities**	**Data required by this section of the core clauses is provided by the *Contractor* in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.**
3	**Time**	
11.2(3)	The *completion date* for the whole of the *works* is	**30 December 2027**
11.2(9)	The *key date*s and the *condition*s to be met are:	***Condition* to be met** — ***key date***
		1 Final SHE File submission and approval
		2 Final QCP submission and approval
		3 Site Establishment (Completed)
		4 Safety Induction and Permits Complete
		5 Construction completion
		6 Testing & Commissioning
		7 Post-Construction Documentation Submission
30.1	The *access dates* are:	**Part of the Site** — **Date**
		1 Site Establishment
		2 Construction Site
31.1	The *Contractor* is to submit a first programme for acceptance within	**Two (2) weeks of the Contract Award Date.**
31.2	The *starting date* is	**[]**
32.2	The *Contractor* submits revised programmes at intervals no longer than	**Five (5) working days.**
35.1	The *Employer* is not willing to take over the *works* before the Completion Date.	[No data needed if this statement is included]

4	**Testing and Defects**	
42.2	The *defects date* is	**52 weeks after Completion of the whole of the *works*.**
43.2	The *defect correction period* is	**Three (3) weeks** **1. Priority 1,Emergency Defects- 24 hours** **2. Priority 2,Normal Defects- 72 hours**
	except that the *defect correction period* for	**Emergency is 24hours**
	and the *defect correction period* for	**Load loss is 24hours**
5	**Payment**	
50.1	The *assessment interval* is	**The 20th day of each successive month.**
51.1	The *currency of this contract* is the	**South African Rand(ZAR).**
51.2	The period within which payments are made is	**Thirty Calendar Days (30) days after the receipt of an invoice**
51.4	The *interest rate* is	**the publicly quoted prime rate of interest (calculated on a 365 day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any dispute, by any manager of such bank, whose appointment it shall not be necessary to prove) for amounts due in Rands and**
6	**Compensation events**	**Refer to NEC3 Engineering Construction Contract (ECC3)**
60.1(13)	The place where weather is to be recorded is:	**Medupi Power Station**
	The *weather measurements* to be recorded for each calendar month are,	**the cumulative rainfall (mm)** **the number of days with rainfall more than 10 mm** **the number of days with minimum air temperature less than 0 degrees Celsius** **the number of days with snow lying at 09:00 hours South African Time** **and these measurements:**
	The *weather measurements* are supplied by	**South African Weather Service**
	The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at:	**Lephalale**
	and which are available from:	**the South African Weather and included in Annexure A to this Contract Data provided by the *Employer***
60.1(13)	Assumed values for the ten year return	**As stated in Annexure A to this Contract Data**

	weather data for each *weather measurement* for each calendar month are:	**provided by the *Employer*.** **Note: If this arrangement is used, delete the rows above for 60.1(13) and delete this note.**
7	**Title**	**There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.**
8	**Risks and insurance**	
80.1	These are additional *Employer*'s risks	**1. None** **2. [●]** **3. [●]**
9	**Termination**	**There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.**
10	**Data for main Option clause**	
B	**Priced contract with bill of quantities**	
60.6	The *method of measurement* is	**[●] published by [●] and amended as stated in Part C2.1, Pricing Assumptions.**
11	**Data for Option W1**	
W1.1	The *Adjudicator* is	**the person selected from the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering Panel of Adjudicators by the Party intending to refer a dispute to him. (see www.ice-sa.org.za). If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the Arbitration Foundation of Southern Africa (AFSA).**
	Address	**1st Floor** **Maisels Chambers** **4 Protea Place** **Sandton** **Map**
	Tel No.	**+27 11 320 0600**
	Fax No.	**+27 11 320 0533**
	e-mail	**info@arbitration.co.za**
W1.2(3)	The *Adjudicator nominating body* is:	**the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See www.ice-sa.org.za) or its successor body.**
W1.4(2)	The *tribunal* is:	**arbitration.**

W1.4(5)	The *arbitration procedure* is	**the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.**
	The place where arbitration is to be held is	**Johannesburg, South Africa**
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	**the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.**

12 Data for secondary Option clauses

X1 Price adjustment for inflation

X1.1(a) The *base date* for indices is **[●].**

X1.1(c) The proportions used to calculate the Price Adjustment Factor are:

	proportion	**linked to index for**	**Index prepared by**
	35%	**[Labour]**	**[SEIFSA Table]**
	50%]	**[Material]**	**C3A[●]**
	15%]	**[Non-adjustable●]**	**[SEIFSA Table G●]**
	0. [●]	**[●]**	**[●]**
	0. [●]	**[●]**	**[●]**
	[●]	**non-adjustable**	
Total	**1.00**		

X2 Changes in the law — **There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.**

X2.1 **The law of the project is the law of the Republic of South Africa**

X5 Sectional Completion

X5.1 The *completion date* for each *section* of the *works* is:

Section	**Description**	***Completion date***
1	**[●]**	**[●]**
2	**[●]**	**[●]**
3	**[●]**	**[●]**

X5 & X7 Sectional Completion and delay damages used together

X7.1 Delay damages for late Completion of the ***section*** | | |

X5.1	*section*s of the *works* are Remainder of the *works* The total delay damages payable by the *Contractor* does not exceed:	**R [●]**
X7	**Delay damages (but not if Option X5 is also used)**	
X7.1	Delay damages for Completion of the whole of the *works* are	**0,5% per day up to a limit of 5%**
X16	**Retention (not used with Option F)**	
X16.1	The *retention free amount* is The *retention percentage* is	**Nil** **10% of the total Price**
X18	**Limitation of liability**	
X18.1	The *Contractor*'s liability to the *Employer* for indirect or consequential loss is limited to:	**R0.0 (zero Rand)**
X18.2	For any one event, the *Contractor*'s liability to the *Employer* for loss of or damage to the *Employer*'s property is limited to:	**the amount of the deductibles relevant to the event**
X18.3	The *Contractor*'s liability for Defects due to his design which are not listed on the Defects Certificate is limited to	**The greater of** • **the total of the Prices at the Contract Date and** • **the amounts excluded and unrecoverable from the *Employer*'s assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.**
X18.4	The *Contractor*'s total liability to the *Employer* for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	**the total of the Prices other than for the additional excluded matters.** **The *Contractor's* total liability for the additional excluded matters is not limited.**

		The additional excluded matters are amounts for which the *Contractor* is liable under this contract for • **Defects due to his design which arise before the Defects Certificate is issued,** • **Defects due to manufacture and fabrication outside the Site,** • **loss of or damage to property (other than the *works*, Plant and Materials),** • **death of or injury to a person and** • **infringement of an intellectual property right.**
X18.5	The *end of liability date* is	**(i) Three (3) years after the *defects date* for latent Defects and** **(ii) the date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.** **A latent Defect is a Defect which would not have been discovered on reasonable inspection by the *Employer* or the *Supervisor* before the *defects date*, without requiring any inspection not ordinarily carried out by the *Employer* or the *Supervisor* during that period. If the *Employer* or the *Supervisor* do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the *Employer* or the *Supervisor* to have discovered the Defect.**
Z	**The *Additional conditions of contract* are**	**Z1 to Z15 always apply.**

Z1 Cession delegation and assignment

Z1.1 The *Contractor* does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the *Employer.*

Z1.2 Notwithstanding the above, the *Employer* may on written notice to the *Contractor* cede and delegate its rights and obligations under this contract to any of its subsidiaries or any of its present divisions or operations which may be converted into separate legal entities as a result of the restructuring of the Electricity Supply Industry.

Z2 Joint ventures

Z2.1 If the *Contractor* constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations then these persons or organisations are deemed to be jointly and severally liable to the *Employer* for the performance of this contract.

Z2.2 Unless already notified to the *Employer*, the persons or organisations notify the *Project Manager* within two weeks of the Contract Date of the key person who has the authority to bind the *Contractor* on their behalf.

Z2.3 The *Contractor* does not alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without the consent of the *Employer* having been given to the *Contractor* in writing.

Z3 Change of Broad Based Black Economic Empowerment (B-BBEE) status

Z3.1 Where a change in the *Contractor's* legal status, ownership or any other change to his business composition or business dealings results in a change to the *Contractor*'s B-BBEE status, the *Contractor* notifies the *Employer* within seven days of the change.

Z3.2 The *Contractor* is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the *Project Manager* within thirty days of the notification or as otherwise instructed by the *Project Manager*.

Z3.3 Where, as a result, the *Contractor's* B-BBEE status has decreased since the Contract Date the *Employer* may either re-negotiate this contract or alternatively, terminate the *Contractor*'s obligation to Provide the Works.

Z3.4 Failure by the *Contractor* to notify the *Employer* of a change in its B-BBEE status may constitute a reason for termination. If the *Employer* terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.

Z4 Confidentiality

Z4.1 The *Contractor* does not disclose or make any information arising from or in connection with this contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the *Contractor*, enters the public domain or to information which was already in the possession of the *Contractor* at the time of disclosure (evidenced by written records in existence at that time). Should the *Contractor* disclose information to Others in terms of clause 25.1, the *Contractor* ensures that the provisions of this clause are complied with by the recipient.

Z4.2 If the *Contractor* is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the *Project Manager*.

Z4.3 In the event that the *Contractor* is, at any time, required by law to disclose any such information which is required to be kept confidential, the *Contractor*, to the extent permitted by law prior to disclosure, notifies the *Employer* so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the *Contractor* may disclose that portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.

Z4.4 The taking of images (whether photographs, video footage or otherwise) of the *works* or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the *Project Manager*. All rights in and to all such images vests exclusively in the *Employer*.

Z4.5 The *Contractor* ensures that all his subcontractors abide by the undertakings in this clause.

Z5 Waiver and estoppel: Add to core clause 12.3:

Z5.1 Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, the *Project Manager*, the *Supervisor*, or the *Adjudicator* does not constitute a waiver of rights, and does not give rise to an estoppel unless the Parties agree otherwise and confirm such agreement in writing.

Z6 Health, safety and the environment: Add to core clause 27.4

Z6.1 The *Contractor* undertakes to take all reasonable precautions to maintain the health and safety of persons in and about the execution of the *works*. Without limitation the *Contractor*:

- accepts that the *Employer* may appoint him as the "Principal Contractor" (as defined and provided for under the Construction Regulations 2014 (promulgated under the Occupational Health & Safety Act 85 of 1993) ("the Construction Regulations") for the Site;
- warrants that the total of the Prices as at the Contract Date includes a sufficient amount for proper compliance with the Construction Regulations, all applicable health & safety laws and regulations and the health and safety rules, guidelines and procedures provided for in this contract and generally for the proper maintenance of health & safety in and about the execution of *works*; and
- undertakes, in and about the execution of the *works*, to comply with the Construction Regulations and with all applicable health & safety laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

Z6.2 The *Contractor*, in and about the execution of the *works*, complies with all applicable environmental laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

Z7 Provision of a Tax Invoice and interest. Add to core clause 51

Z7.1 Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice in accordance with the *Employer*'s procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.

Z7.2 If the *Contractor* does not provide a tax invoice in the form and by the time required by this contract, the time by when the *Employer* is to make a payment is extended by a period equal in time to the delayed submission of the correct tax invoice. Interest due by the *Employer* in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.

Z7.3 The *Contractor* (if registered in South Africa in terms of the companies Act) is required to comply with the requirements of the Value Added Tax Act, no 89 of 1991 (as amended) and to include the *Employer*'s VAT number 4740101508 on each invoice he submits for payment.

Z8 Notifying compensation events

Z8.1 Delete from the last sentence in core clause 61.3, "unless the *Project Manager* should have notified the event to the *Contractor* but did not".

Z9 *Employer's* limitation of liability

Z9.1 The *Employer's* liability to the *Contractor* for the *Contractor's* indirect or consequential loss is limited to R0.00 (zero Rand)

Z9.2 The *Contractor*'s entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the *Employer*'s liability under the indemnity is limited.

Z10 Termination: Add to core clause 91.1, at the second main bullet point, fourth sub-bullet point, after the words "against it":

Z10.1 or had a business rescue order granted against it.

Z11 Addition to secondary Option X7 Delay damages (if applicable in this contract)

Z11.1 If the amount due for the *Contractor*'s payment of delay damages reaches the limits stated in this Contract Data for Option X7 or Options X5 and X7 used together, the *Employer* may terminate the *Contractor*'s obligation to Provide the Works using the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table.

Z12 Ethics

For the purposes of this Z-clause, the following definitions apply:

Affected Party means, as the context requires, any party, irrespective of whether it is the *Contractor* or a third party, such party's employees, agents, or Subcontractors or Subcontractor's employees, or any one or more of all of these parties' relatives or friends,

Coercive Action means to harm or threaten to harm, directly or indirectly, an Affected Party or the property of an Affected Party, or to otherwise influence or attempt to influence an Affected Party to act unlawfully or illegally,

Collusive Action means where two or more parties co-operate to achieve an unlawful or illegal purpose, including to influence an Affected Party to act unlawfully or illegally,

Committing Party means, as the context requires, the *Contractor*, or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractor or the Subcontractor's employees,

Corrupt Action means the offering, giving, taking, or soliciting, directly or indirectly, of a good or service to unlawfully or illegally influence the actions of an Affected Party,

Fraudulent Action means any unlawfully or illegally intentional act or omission that misleads, or attempts to mislead, an Affected Party, in order to obtain a financial or other benefit or to avoid an obligation or incurring an obligation,

Obstructive Action means a Committing Party unlawfully or illegally destroying, falsifying, altering or concealing information or making false statements to materially impede an investigation into allegations of Prohibited Action, and

Prohibited Action means any one or more of a Coercive Action, Collusive Action Corrupt Action, Fraudulent Action or Obstructive Action.

Z12.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.

Z12.2 The *Employer* may terminate the *Contractor*'s obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Contractor* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the *Employer* has. It is not required that the Committing Party had to have been found guilty, in court or in any other similar process, of such Prohibited Action before the *Employer* can terminate the *Contractor*'s obligation to Provide the Services for this reason.

Z12.3 If the *Employer* terminates the *Contractor*'s obligation to Provide the Services for this reason, the amounts due on termination are those intended in core clauses 92.1 and 92.2.

Z12.4 A Committing Party co-operates fully with any investigation pursuant to alleged Prohibited Action. Where the *Employer* does not have a contractual bond with the Committing Party, the *Contractor* ensures that the Committing Party co-operates fully with an investigation.

Z13 Insurance

Z 13.1 Replace core clause 84 with the following:

Insurance cover 84

84.1 When requested by a Party, the other Party provides certificates from his insurer or broker stating that the insurances required by this contract are in force.

84.2 The *Contractor* provides the insurances stated in the Insurance Table A.

84.3 The insurances provide cover for events which are at the *Contractor*'s risk from the *starting date* until the earlier of Completion and the date of the termination certificate.

INSURANCE TABLE A

Insurance against	Minimum amount of cover or minim limit of indemnity
Loss of or damage to the *works*, Plant and Materials	The replacement cost where not covered by the *Employer*'s insurance The *Employer*'s policy deductible, as Contract Date, where covered by the *Employer*'s insurance
Loss of or damage to Equipment	The replacement cost
Liability for loss of or damage to property (except the *works*, Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the *Contractor*) caused by activity in connection with this contract	Loss of or damage to property *Employer*'s property The replacement cost where not covered by the *Employer*'s insurance The *Employer*'s policy deductible, as Contract Date, where covered by the *Employer*'s insurance Other property The replacement cost Bodily injury to or death of a person The amount required by applicable l
Liability for death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract	The amount required by the applicabl law

Z 13.2 Replace core clause 87 with the following:
The *Employer* provides the insurances stated in the Insurance Table B.

INSURANCE TABLE B

Insurance against or name of policy	Minimum amount of cover or minimum l of indemnity
Assets All Risk	Per the insurance policy document
Contract Works insurance	Per the insurance policy document
Environmental Liability	Per the insurance policy document
General and Public Liability	Per the insurance policy document
Transportation (Marine)	Per the insurance policy document
Motor Fleet and Mobile Plant	Per the insurance policy document
Terrorism	Per the insurance policy document
Cyber Liability	Per the insurance policy document
Nuclear Material Damage and Business Interruption	Per the insurance policy document
Nuclear Material Damage Terrorism	Per the insurance policy document

Z14 Nuclear Liability

Z14.1 The *Employer* is the operator of the Koeberg Nuclear Power Station (KNPS), a nuclear installation, as designated by the National Nuclear Regulator of the Republic of South Africa, and is the holder of a nuclear licence in respect of the KNPS.

Z14.2 The *Employer* is solely responsible for and indemnifies the *Contractor* or any other person against any and all liabilities which the *Contractor* or any person may incur arising out of or resulting from nuclear damage, as defined in Act 47 of 1999, save to the extent that any liabilities are incurred due to the unlawful intent of the *Contractor* or any other person or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.

Z14.3 Subject to clause Z14.4 below, the *Employer* waives all rights of recourse, arising from the aforesaid, save to the extent that any claims arise or liability is incurred due or attributable to the unlawful intent of the *Contractor* or any other person, or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.

Z14.4 The *Employer* does not waive its rights provided for in section 30 (7) of Act 47 of 1999, or any replacement section dealing with the same subject matter.

Z14.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

Z15 Asbestos

For the purposes of this Z-clause, the following definitions apply:

AAIA means approved asbestos inspection authority.

ACM means asbestos containing materials.

AL means action level, i.e. a level of 50% of the OEL, i.e. 0.1 regulated asbestos fibres per ml of air measured over a 4 hour period. The value at which proactive actions is required in order to control asbestos exposure to prevent exceeding the OEL.

Ambient Air means breathable air in area of work with specific reference to breathing zone, which is defined to be a virtual area within a radius of approximately 30cm from the nose inlet.

Compliance Monitoring means compliance sampling used to assess whether or not the personal exposure of workers to regulated asbestos fibres is in compliance with the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.

OEL means occupational exposure limit.

Parallel Measurements means measurements performed in parallel, yet separately, to existing measurements to verify validity of results.

Safe Levels means airborne asbestos exposure levels conforming to the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.

Standard means the *Employer*'s Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.

SANAS means the South African National Accreditation System.

TWA means the average exposure, within a given workplace, to airborne asbestos fibres, normalised to the baseline of a 4 hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.

Z15.1 The *Employer* ensures that the Ambient Air in the area where the *Contractor* will Provide the Services conforms to the acceptable prescribed South African standard for asbestos, as per the regulations published in GNR 155 of 10 February 2002, under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) ("Asbestos Regulations"). The OEL for asbestos is 0.2 regulated asbestos fibres per millilitre of air as a 4-hour TWA, averaged over any continuous period of four hours, and the short term exposure limit of 0.6 regulated asbestos fibres per millilitre of air as a 10-minute TWA, averaged over any 10 minutes, measured in accordance with HSG248 and monitored according to HSG173 and OESSM.

Z15.2 Upon written request by the *Contractor*, the *Employer* certifies that these conditions prevail. All measurements and reporting are effected by an independent, competent, and certified occupational hygiene inspection body, i.e. a SANAS accredited and Department of Employment and Labour approved AAIA. The *Contractor* may perform Parallel Measurements and related control measures at the *Contractor*'s expense. For the purposes of compliance the results generated from Parallel Measurements are evaluated only against South African statutory limits as detailed in clause Z15.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.

Z15.3 The *Employer* manages asbestos and ACM according to the Standard.

Z15.4 In the event that any asbestos is identified while Providing the Services, a risk assessment is conducted and if so required, with reference to possible exposure to an airborne concentration of above the AL for asbestos, immediate control measures are implemented and relevant air monitoring conducted in order to declare the area safe.

Z15.5 The *Contractor*'s personnel are entitled to stop working and leave the contaminated area forthwith until such time that the area of concern is declared safe by either Compliance Monitoring or an AAIA approved control measure intervention, for example, per the emergency asbestos work plan, if applicable.

Z15.6 The *Contractor* continues to Provide the Services, without additional control measures presented, on presentation of Safe Levels. The contractually agreed dates to Provide the Services, including the Completion Date, are adjusted accordingly. The contractually agreed dates are extended by the notification periods required by regulations 3 and 21 of the Asbestos Regulations, 2001.

Z15.7 Any removal and disposal of asbestos, asbestos containing materials and waste, is done by a registered asbestos contractor, instructed by the *Employer* at the *Employer*'s expense, and conducted in line with South African legislation.

Annexure A: One-in-ten-year-return *weather data* obtained from SA Weather Bureau for [weather station]

If any one of these *weather measurements* recorded within a calendar month, before the Completion Date for the whole of the *works* and at the place stated in this Contract Data is shown to be more adverse than the amount stated below then the *Contractor* may notify a compensation event.

	Weather measurement				
Month	Cumulative rainfall (mm)	Number of days with rain more than 10mm	Number of days with min air temp < 0 deg.C	Number of days with snow lying at 08:00 CAT	[Other measurements if applicable]
January	**[●]**	**[●]**	**[●]**	**[●]**	
February	**[●]**	**[●]**	**[●]**	**[●]**	
March	**[●]**	**[●]**	**[●]**	**[●]**	
April	**[●]**	**[●]**	**[●]**	**[●]**	
May	**[●]**	**[●]**	**[●]**	**[●]**	
June	**[●]**	**[●]**	**[●]**	**[●]**	
July	**[●]**	**[●]**	**[●]**	**[●]**	
August	**[●]**	**[●]**	**[●]**	**[●]**	
September	**[●]**	**[●]**	**[●]**	**[●]**	
October	**[●]**	**[●]**	**[●]**	**[●]**	
November	**[●]**	**[●]**	**[●]**	**[●]**	
December	**[●]**	**[●]**	**[●]**	**[●]**	

Only the difference between the more adverse recorded weather and the equivalent measurement given above is taken into account in assessing a compensation event.

C1.2 Contract Data

Part two - Data provided by the *Contractor*

[Instructions to the contract compiler: (delete this notes before issue to tenderers with an enquiry) Whenever a cell is shaded in the left hand column it denotes this data is optional. If not required select and delete the whole row, otherwise insert the required Data.]

Notes to a tendering contractor:

1. Please read both the NEC3 Engineering and Construction Contract (April 2013) and the relevant parts of its Guidance Notes (ECC3-GN)[1] in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 156 to 158 of the ECC3 (April 2013) Guidance Notes.
2. The number of the clause which requires the data is shown in the left hand column for each statement however other clauses may also use the same data
3. Where a form field like this [ ] appears, data is required to be inserted relevant to the option selected. Click on the form field ***once*** and type in the data. Otherwise complete by hand and in ink.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The *Contractor* is (Name): Address Tel No. Fax No.	
11.2(8)	The *direct fee percentage* is The *subcontracted fee percentage* is	**%** **%**
11.2(18)	The *working areas* are the Site and	
24.1	The *Contractor's* key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job Responsibilities: Qualifications: Experience:	

[1] Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009 or see www.ecs.co.za

		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .
11.2(3)	The *completion date* for the whole of the *works* is	
11.2(14)	The following matters will be included in the Risk Register	
11.2(19)	The Works Information for the *Contractor*'s design is in:	
31.1	The programme identified in the Contract Data is	
B	**Priced contract with bill of quantities**	
11.2(21) **11.2(31)**	**The *bill of quantities* is in** **The tendered total of the Prices is**	 **(in figures)** **(in words), excluding VAT**
	Data for Schedules of Cost Components	*Note "SCC" means Schedule of Cost Components starting on page 60, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC3 (April 2013).*
A	**Priced contract with activity schedule**	**Data for the Shorter Schedule of Cost Components**
41 in SSCC	The percentage for people overheads is:	**%**
21 in SSCC	The published list of Equipment is the last edition of the list published by The percentage for adjustment for Equipment in the published list is	 **Minus %**

22 in SSCC	The rates of other Equipment are:	**Equipment**	**Size or capacity**	**Rate**

61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are **Note: Hourly rates are estimated 'cost to company of the employee' and not selling rates.** **Please insert another schedule if foreign resources may also be used**	**Category of employee**	**Hourly rate**

62 in SSCC	The percentage for design overheads is	**%**
63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:	

C1.3 Forms of Securities

Pro formas for Bonds & Guarantees

For use with the NEC3 Engineering & Construction Contract

The *conditions of contract* stated in the Contract Data Part 1 include the following Secondary Options:

Option X13: Performance Bond

Each of these secondary Options requires a bond or guarantee “in the form set out in the Works Information”. Pro forma documents for these bonds and guarantees are provided here for convenience but are to be treated as part of the Works Information.

Option X16: Retention (not used with Option F)

The *Contractor* may provide a Retention Money Guarantee in the form stated here. When the *Employer* receives and accepts a Retention Money Guarantee exactly in the form stated he will instruct the *Project Manager* not to assess any amount be retained in terms of secondary Option X16.

The *Contractor* shall guarantee his ASGI-SA Obligations by providing the *Employer* with an ASGI-SA Guarantee in the form provided here.

The organisation providing the bond / guarantee does so by copying the pro forma document onto his letterhead without any change to the text or format and completing the required details. The completed document is then given to the *Employer* within the time stated in the contract.

Pro forma Performance Bond – Demand Guarantee (for use with Option X13)

(to be reproduced exactly as shown below on the letterhead of the Contractor's Parent Company)

Eskom Holdings SOC Ltd
Megawatt Park
Maxwell Drive
Sandton
Johannesburg Date:

Dear Sirs

Reference No. **[●]** *[Drafting Note: Bank reference number to be inserted]*

Performance Bond – Demand Guarantee: *[Drafting Note: Name of Contractor to be inserted]*

Project [ ] Contract Reference: …… *[Drafting Note: Contractor contract reference number to be inserted]*

1. In this Guarantee the following words and expressions shall have the following meanings:-

1.1 "Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]

1.2 "Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]

1.3 "Contract" – means the written agreement relating to the Project, entered into between Eskom and the Contractor, on or about the [●] day of [●] 200[●] (Contract Reference No. [.]as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted]

1.4 "Contractor" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]

1.5 "Eskom" - means Eskom Holdings SOC Ltd, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30].

1.6 "Expiry Date" - means the date on which the Defects Certificate is issued in terms of the Contract.

1.7 "Guaranteed Sum" - means the sum of R [●] ([●] Rand);

1.8 "Project" - means [insert if applicable.].

2. At the instance of the Contractor, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the Contractor of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

3. A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:

3.1 be signed on behalf of Eskom by a Group Executive, Divisional Executive, Senior General Manager, General Manager or its delegate;

3.2 state the amount claimed ("the Demand Amount');

3.3 state that the Demand Amount is payable to Eskom in the circumstances contemplated in the Contract.

4. Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:

4.1 is and shall be absolute provided demand is made in terms of this bond in all circumstances; and

4.2 is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

5. The Bank's obligations in terms of this Guarantee:

5.1 shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

5.2 shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between Eskom and the Contractor.

6. Eskom shall be entitled to arrange its affairs with the Contractor in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the Contractor or any variation under or to the Contract.

7. Should Eskom cede its rights against the Contractor to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.

8. This Guarantee:

8.1 shall expire on the Expiry Date until which time it is irrevocable;

8.2 is, save as provided for in 7 above, personal to Eskom and is neither negotiable nor transferable;

8.3 shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

8.4 shall be regarded as a liquid document for the purpose of obtaining a court order; and

8.5 shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.

8.6 Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

9. The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ Date _____

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____
Bank's seal or stamp

Pro forma Retention Money Guarantee (may be used when Option X16 applies)

(to be reproduced exactly as shown below on the letterhead of the Bank providing the Guarantee)

Eskom Holdings SOC Limited
Megawatt Park
Maxwell Drive
Sandton
Johannesburg Date:

Dear Sirs

Reference No. **[●]** *[Drafting Note: Bank reference number to be inserted]*

Retention Money Guarantee: *[Drafting Note: Name of Contractor to be inserted]*

Project [ ] : Contract Reference: *[Drafting Note: Contractor contract reference number to be inserted]*

1. In this Guarantee the following words and expressions shall have the following meanings:-

1.1 "Bank" - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]

1.2 "Bank's Address" - means [●]; [Drafting Note: Bank's physical address to be inserted]

1.3 "Contract" – means the written agreement relating to the Project, entered into between Eskom and the Contractor, on or about the [●] day of [●] 200[●] (Contract Reference No. ……. as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted]

1.4 "Contractor" – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]

1.5 "Eskom" - means Eskom Holdings SOC Limited, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30

1.6 "Expiry Date" - means the date on which the Defects Certificate is issued in terms of the Contract.

1.7 "Guaranteed Sum" - means the sum of R [●] ([●] Rand); [Drafting Note: Insert amount of Retention Money Guarantee.].

1.8 "Project" - means the……..

2. At the instance of the Contractor, we the undersigned _____ and _____, in our respective capacities as _____ and _____ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the Contractor of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

3. A demand for payment under this guarantee shall be made in writing at the Bank's address and shall:

3.1 be signed on behalf of Eskom by a director of Eskom or his authorised delegate.

3.2 state the amount claimed ("the Demand Amount');

3.3 state that the Contractor has failed to carry out his obligation(s) to rectify certain defect(s) for which he is responsible under the Contract (and the nature of such defect(s)) alternatively that the Demand Amount is payable to Eskom in the circumstances contemplated in the Contract.

4. Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank's obligation/s to make payment:

4.1 is and shall be absolute provided demand is made in terms of this bond in all circumstances; and

4.2 is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

5. The Bank's obligations in terms of this Guarantee:

5.1 shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

5.2 shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed by the fact that a dispute may exist between Eskom and the Contractor.

6. Eskom shall be entitled to arrange its affairs with the Contractor in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the Contractor or any variation under or to the Contract.

7. Should Eskom cede its rights against the Contractor to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.

8. This Guarantee:

8.1 shall expire on the Expiry Date until which time it is irrevocable;

8.2 is, save as provided for in **7** above, personal to Eskom and is neither negotiable nor transferable;

8.3 shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

8.4 shall be regarded as a liquid document for the purpose of obtaining a court order; and

8.5 shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.

8.6 Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

9. The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at _____ Date _____ Bank's seal or stamp

For and behalf of the Bank

Bank Signatory: _____ Bank Signatory: _____

Witness: _____ Witness: _____

PART 2: PRICING DATA
ECC3 Option A

Document reference	Title	No of pages
C2.1	Pricing assumptions: Option A	
C2.2	The *activity schedule*	

C2.1 Pricing assumptions: Option A

1. How work is priced and assessed for payment

Clause 11 in NEC3 Engineering and Construction Contract, (ECC3) Option A states:

Identified and defined terms 11 11.2

(20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract.

(27) The Price for Work Done to Date is the total of the Prices for

- each group of completed activities and
- each completed activity which is not in a group.

A completed activity is one which is without Defects which would either delay or be covered by immediately following work.

(30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

This confirms that Option A is a lump sum form of contract where the work is broken down into activities, each of which is priced by the tendering contractor as a lump sum. Only completed activities are assessed for payment at each assessment date; no part payment is made if the activity is not completed by the assessment date.

2. Function of the Activity Schedule

Clause 54.1 in Option A states: “Information in the Activity Schedule is not Works Information or Site Information”. This confirms that specifications and descriptions of the work or any constraints on how it is to be done are not included in the Activity Schedule but in the Works Information. This is further confirmed by Clause 20.1 which states, “The *Contractor* Provides the Works in accordance with the Works Information”. Hence the *Contractor* does **not** Provide the Works in accordance with the Activity Schedule. The Activity Schedule is only a pricing document.

3. Link to the programme

Clause 31.4 states that “The *Contractor* provides information which shows how each activity on the Activity Schedule relates to the operations on each programme which he submits for acceptance”. Ideally the tendering contractor will develop a high level programme first then resource each activity and thus arrive at the lump sum price for that activity both of which can be entered into the *activity schedule*.

4. Preparing the *activity schedule*

Generally it is the tendering contractor who prepares the *activity schedule* by breaking down the work described within the Works Information into suitable activities which can be well defined, shown on a programme and priced as a lump sum.

The *Employer*, in his Instructions to Tenderers or in a Tender Schedule, may have listed some items that he requires the *Contractor* to include in his *activity schedule* and be priced accordingly.

It is assumed that in preparing his *activity schedule* the *Contractor:*

- Has taken account of the guidance given in the ECC3 Guidance Notes pages 19 and 20;
- Understands the function of the Activity Schedule and how work is priced and paid for;
- Is aware of the need to link the Activity Schedule to activities shown on his programme;
- Has listed and priced activities in the *activity schedule* which are inclusive of everything necessary and incidental to Providing the Works in accordance with the Works Information, as it was at the time of tender, as well as correct any Defects not caused by an *Employer's* risk;
- Has priced work he decides not to show as a separate activity within the Prices of other listed activities in order to fulfil the obligation to complete the *works* for the tendered total of the Prices.
- Understands there is no adjustment to the lump sum Activity Schedule price if the amount, or quantity, of work within that activity later turns out to be different to that which the *Contractor* estimated at time of tender. The only basis for a change to the Prices is as a result of a compensation event.

An activity schedule could have the following format:

Item No.	**Programme Reference**	**Activity description**	**Price**
1	Preliminaries and General		
2	Supply and Installation		

C2.2 the *activity schedule*

Use this page as a cover page to the *Contractor*'s *activity schedule*.

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
	This cover page	1
C3.1	*Employer*'s Works Information	37
C3.2	*Contractor's works Information*	1
	Total number of pages	39

C3.1: EMPLOYER'S WORKS INFORMATION

Contents

1 Description of the *works*

1.1 Executive overview

A Plant Information System (PIS) in a Medupi Power Station allows near real-time and historical plant information to be available to users and other software applications. It provides a common and consistent source of data, which is used for monitoring the plant and analysing plant performance. This includes data generated by all process control systems, as well as any other relevant plant data from other sources.

The PIS performs short term storage, long term storage and archiving of process information for the life of the Power Station. A central Process Historian is provided by the PIS for the storage of all relevant plant process information produced at the Power Station. In addition, the system is also used for remote access and retrieval of plant information by users via an interface from a Station Office LAN, and to link to other information system applications on the Station Office LAN.

This document contains information regarding the need to replace the current General Electric and the Siemens Plant Information System being used at Medupi Power Station and the requirements for the replacement to take place. The Plant Information System used at Medupi for Unit 4 – 6, Station Electrical Reticulation (SER) and Balance of Plant (BOP) is the GE PIS (Previously Alstom) while for Unit 3 – 1 is the Siemens PIS. Through the commissioning of the GE PIS various issues were found and needed to be addressed and some of the Siemen's PIS.

1.2 *Employer*'s objectives and purpose of the *work*

The purpose of this SoW is to outline and describe the Plant Information System's technical and operational requirements for the proposed Plant Information System's Replacement, to identify risks and constraints and to identify critical stakeholders and to provide technical content in support of engineering work requests.

This change is necessary to address the current challenges faced with the frequent unavailability of the plant information system.

The following abbreviations are used in this Works Information:

Abbreviation & Acronym	Description
ROC	Required Operational Capability
SRD	Stakeholders Requirements Definition
BOP	Balance Of Plant
CAL	Client Access License
DCS	Distributed Control System
DWS	Disturbance Worksheet
EWS	Event Worksheet
GPS	Global Positioning System
SDD	Solid State Drive
IIS	Internet Information Services
IMS	Information Management System: ALSPA reporting system
iSCSI	Internet Small Computer System Interface
LPS	Low Pressure Services
NTP	Network Time Protocol
OLE	Object Linking and Embedding
OPC (UA)	OLE for Process Control (Unified Architecture)
OPC (DA)	OLE for Process Control (Data Access)
PIS	Plant Information System
phBSig	Program Boolean signal
RWS	Raw Worksheet
SAN	Storage Area Network
SCE	Smart Calculation Engine
SER	Station Electrical Reticulation
SQL	Structured Query Language
SWS	Statistical Worksheet
UTM	Unified Threat Management
VM	Virtual Machine on PIS stations
VPN	Virtual Private Network
WCF	Windows Communication Foundation
WTP	Water Treatment Plant

1.2.1 Interpretation of incorporated documentation

Wherever the following words or phrases are used in the listed or referred documentation, they are interpreted in this contract as follows:

Word or Phrase	Interpretation
Eskom Holdings SOC Limited	The *Employer*.
Accepted or approved by (or to the satisfaction of) the *Project Manager*, Engineer and *Employer*.	Accepted by the *Project Manager* or the *Supervisor*.
A duty, procedure, decision or action of the Engineer, *Employer* or the Superintendent, Eskom's Representative, Site *Supervisor* or Clerk of *Works*.	An action of the *Project Manager* or the *Supervisor* depending on the context. Clause 14 of the Core Clauses determines what the actions of each are. Either may delegate in terms of Clause 14.2

1.2.2 Documents Referenced in Works Information

Numerous documents such as standards and specifications are referenced within this Works Information. All these referenced documents including the normative references must be adhered to while providing the works.

Where a SANS standard referenced has been replaced by a newer standard, the *Contractor* must comply with the latest revision of the standard. Where a SANS standard referenced is composed of several parts, all applicable parts are to be adhered to.

All national and international standards referenced are provided in this document however the *Contractor* must obtain them at his own expense. Documents developed by the *Employer* as referenced in this Works Information are provided to the *Contractor*.

2 Management and start up.

2.1 Management meetings

A **Weekly Site and Technical Meeting** shall be held to deal with technical, quality, SHE, programme performance and project related administrative matters at work activity level. The meeting shall be chaired by the *Supervisor* and attended by the *Supervisor*, SHE, Quality, Environmental Officers and Planner (*Contractor* and the *Employer* representatives).

A **Monthly Progress Meeting** shall be held to deal with technical, programme performance, cost and contract management at a project management level. The meeting shall be chaired by the *Project Manager* and attended by the *Project Manager*, *Supervisor*, Engineers, and SHE, Quality, Environmental Officers and Planner (*Contractor* and the *Employer* representatives).

A **Monthly Measurement Meeting** shall be held to address processing of the *Contractor's* invoices, backup documentation, and monitoring of the activity schedule against the Target Price. The *Contractor* shall present a monthly report at this meeting which will include graphs of actual progress against tendered progress as well as cumulative actual cost against cumulative tendered cost as per the tendered programme. The format of this monthly report as well as the level of detail of its contents shall be agreed with the *Project Manager*.

Before each successive Monthly Measurement Meeting (i.e. on a weekly basis), the *Contractor* shall submit to the *Supervisor* all current backup documentation for acceptance. Backup documentation shall include, but not limited to, all calculation sheets, completed activities, drawings, etc.; acceptance of completed work payment purposes, including confirmation of attainment of each criteria set out either in the specification or any other document which this contract prescribes.

Following the Monthly Measurement Meeting, the *Contractor* shall present a detailed final schedule, including the necessary backup documentation, to the *Supervisor* for review and acceptance. Once accepted by the *Supervisor*, the *Contractor* will submit it to the *Project Manager*. This will then be used by the *Project Manager* to assess the amount due in terms of Clause 50 of the ECC.

The final format and layout of the monthly schedule as well as the level of detail of backup information required are to be agreed between the *Project Manager* and the *Contractor*. Clause 52 of the ECC shall apply in terms of accounts to be kept by the *Contractor* to verify the above monthly schedule of actual costs.
All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting.

2.2 Documentation control

2.2.1 Documentation to be provided by the *Employer*

The *Contractor* will be provided with one signed copy of the Contract, which includes contract agreement with the documents which would make up the Contract as identified in the form of agreement.

2.2.2 Document Identification

All documents issued shall be numbered, dated and registered on the project document management system, maintained by the *Contractor* and conforming to the *Contractor's* Quality Management Plan. The documents shall be available at the recorded locations as noted in the document management system.

All documents supplied by the *Contractor* are subject to the *Employer*'s acceptance. The *Contractor* includes the *Employer*'s drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor* and his Sub*Contractor*s. Drawing numbers are assigned by the *Employer* as drawings are developed. The Contractor shall establish a document tracking system to record the dates for the supply and receipt of all design drawings, calculations and requests for information. The Contractor will be issued with a series of project drawing numbers which shall apply to all drawings including those from Subcontractors. These numbers will then be used for reference throughout the project.

2.2.3 Document Submission

Within three (3) weeks of the starting date, the *Contractor* complies with the Vendor Document Submittal Schedule regarding documentation submission.

All project documents must (electronic and hard copies) be submitted to the *Project Manager* using a Transmittal Note and shall comply with the Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014).

2.2.4 Email Subject

When using the e-mail to submit, the *Contractor* shall include on the email subject as a minimum, the (Station Project Name_Discipline_Subject). Large electronic files shall be delivered as an ORIGINAL plus a USB Memory Stick or Flash Drive to the *Project Manager* or where possible a Large File Transfer Facility can be used for documents submission.

2.2.5 Electronic Data Control

The *Contractor* shall carry out a daily backup of all electronic information contained on his computer system. Electronic backup information shall be kept in an appropriate format, suitably labelled, segregated and stored in an environment that will not adversely affect its condition.

2.2.6 Incoming and Outgoing Correspondence

The *Contractor* shall number and date all incoming and outgoing correspondence as per agreed communication matrix.

2.2.7 Daily Records

The *Contractor* must keep daily records of daily diaries for work performed and submit them to the *Supervisor* on a daily basis.

2.2.8 Drawings Format and Layout

The creation, issuing and control of all Engineering Drawings shall comply with the Engineering drawing Standard, 240-86973501. As a minimum, the *Contractor* shall submit to the *Project Manager* one hardcopy and an electronic copy and drawings may not be "Right Protected" or encrypted.

2.3 Health and safety risk management

The *Contractor* shall comply with the Eskom's Minimum Requirements for Health and Safety. SHE Specification 240-146140396 and applicable procedures, policies, guidelines and standards provided in this Works Information. The *Contractor* shall comply with the Occupational Health and Safety Act (OHS Act No 85 of 1995) and Regulations and the *Contractor* shall comply with any additional current statutory requirements of any relevant Government Departments regarding health.

Only the latest version/ revision of the applicable legislation, acts and regulations shall be deemed to be accepted at Medupi Power Station. Not limited to the following below legislation, acts and regulations are complied with:

- Compensation for Occupational Injuries and Diseases Act 130 of 1993
- National Water Act 36 of 1998
- Occupational Health and Safety Act and Regulations (85 of 1993)
- National Environmental Management Act 107 of 1998
- Applicable South African National Standards (SANS)
- National Road Traffic Act 93 of 1996
- Basic Conditions of Employment Act 75 of 1997
- National Veld and Forest Fire Act and Regulations 101 of 1998
- Environmental Conservation Act and Regulations 73 of 1989
- SACPCMP Act no. 48 of 2000
- Radiation Protection Act
- COVID-19 Occupational Health And Safety Measures In Workplaces COVID-19 (C19 OHS), 2020

The *Contractor* shall establish and enforce rules to ensure the health and safety of his own employees and those of its Sub *Contractor*s so that high standards of personnel health and safety are achieved and maintained. The *Contractor* shall exercise and enforce all necessary care and measures to preclude exposure of personnel, labour and nearby residents (if any) to potential health hazards and environmental pollutants.

The *Contractor* shall ensure that all persons which are employed and or deployed to work on site undergo police clearance, and are certified to have no criminal records. This shall be done prior to them being allowed or given access to start work on site.

The *Contractor* is required to compile a SHE file as per the scope of work to comply with the *Employer*'s specification, which includes but not limited to the following;

- Safety, Health and Environmental Plan (SHE Plan)
- SHE organization within the Company-Responsibility & Accountability
- OHS Incident management Procedure (32-95)
- Planning of conduct of work activities including planning for changes and emergency work (Operational Plan)
- Management of PPE- Personal Protective Equipment (Procedure with the matrix)
- Emergency planning and fire risk management
- Vehicle and driver behaviour safety (Competency, Traffic Management, etc.)
- Sub-*Contractor* or supplier selection and management
- Design and specifications (Drawings)
- Key personnel competency, training, appointments
- Communication and awareness Plan
- Management commitment and visible felt leadership (32-407)
- *Employer's* Baseline SHE Risk Assessment (BRA)
- *Contractor's* Baseline Risk Assessment in line with the *Employer's BRA (*Identification, assessment and management of Safety, Health and Environmental risks related to the scope of work. The methodology used for the risk assessment must be provided together with the BRA.)
- Valid Letter of Good Standing (COIDA or equivalent)
- SHE policy signed by CEO/ MD- Comply to OHS Act Section 7 or OHSAS 18001
- Occupational hygiene and health risk assessment
- Medical surveillance

- It is essential that Eskom as well as the Contractors involved adhere to the General Safety regulations of the OHS Act 85 of 1993. This will ensure that all work is performed safely, and all personnel are equipped with appropriate safety equipment and clothing that will mitigate unsafe activities. No person will commence work during the project unless:

- Activity risk assessment is conducted and reviewed as and when the risk changes.
- The correct Personal Protective Equipment is provided in line with the activity risk assessment for the works.
- Work area shall be barricaded accordingly.
- The person using the relevant equipment has been fully trained in the safe operation and use of such equipment.

- The *Contractor* shall comply with the latest revision of Eskom Medupi Power Station's Health, Safety and Environmental Specifications.

- The *Contractor* shall comply with any other SHE requirements by the *Employer*.

2.3.1 General Requirements

- The *Contractor* complies with the Occupational Health and Safety Act no 85 of 1993 and its regulations, Eskom SHE Policy, Standards, Procedures, Guidelines, Specifications and Regulations.

- The *Contractor* always ensures safety awareness through continuous training.

- The *Contractor* is at all times responsible for the supervision of his employees, agents and Sub-Contractors and takes full responsibility and accountability for ensuring that they are competent, compliant and aware of the legal requirements and other requirements and execute the works accordingly.

- The *Contractor* ensures that all statutory appointments and appointments required by any Eskom Regulations are made in writing and that all appointees fully understand their responsibilities and are trained and competent to execute their duties.

- The *Employer*, or any person appointed by the *Employer*, may, at any stage during the term of the contract:

    - Conduct health and safety audits by a competent person regarding all aspects of compliance with the SHEQ Requirements, at any off-site place of work, or the site establishment of the Contractor.

    - Refuse any employee, Sub-Contractor or agent of the *Contractor* access to the premises if such a person has been found to commit an unsafe act or any unsafe working practice or is found not to be competent or authorized.

    - Issue the *Contractor* with a stop order, should the *Employer* become aware of any unsafe working procedure or condition or any non-compliance.

- The *Contractor* immediately reports any incidents, disabling injury, near miss, first aid incident as well as any threat to health and safety of which it becomes aware at the works or on the Site to the Project Manager.

- The *Contractor* agrees that the *Employer* is relieved of any and all of its responsibilities and liabilities in terms of the Occupational Health and Safety Act no 85 of 1993 in respect of any acts or omissions of the *Contractor*, and the Contractor's employees, agents or Sub-Contractors, to the extent permitted by the Occupational Health and Safety Act no 85 of 1993.

- The *Contractor* ensures that all his personnel attend a Health and Safety Induction Course presented by Security Department, Monday to Friday – 09:00 to 11:00, free of charge prior to commencement of any works. This is a two (2) hour course and is valid for the duration of one (1) year at Medupi Power Station.

- The *Contractor* works strictly to regularly updated risk assessment.
- The *Contractor* ensures supervised and authorised entry into the plant.
- The *Contractor* barricades the entire perimeter of the site.
- The *Contractor* ensures at all times compliance with the safety regulations imposed by any act of parliament, or any regulation or by law of any statutory authority.
- The *Contractor* complies with the Occupational Health and Safety Act and Regulations, 1993 and all regulations made there under as well as the Employer's safety and operating procedures.
- The *Contractor* acknowledges that he is fully aware of the requirements of all the above and undertakes to employ people who have received sufficient training that they can comply therewith. The *Contractor* undertakes not to do, or not to allow anything to be done which will contravene any provisions of the act, regulations or operating procedures.
- • All employees of the *Contractor* must attend a safety induction course before they are allowed to work on site.
- It is the responsibility of the *Contractor* to ensure that all employees have attended the safety induction.
- The *Contractor* holds a Toolbox Talk and inspects all PPE before any work commences and keep written proof of such actions.
- The *Contractor* complies with all the applicable procedures as required by the *Employer*; Procedures are available from the *Employer's* Documentation Centre on request.
- The *Contractor* familiarizes himself with all permit requirements for work to be done on all plant systems and ensures that permits are applied for accordingly.
- The following risks are identified by the *Employer*, and the *Contractor* includes these in his risk assessment:
    - Injury caused by hand tools.
    - High noise level.
    - Falling when working at heights.
    - Welding which may result in burning.
    - Movement of stairs while walking.
    - Falling objects.
    - Dust
- Any tampering with the *Employer's* fire equipment is strictly forbidden.
- All work done by the *Contractor* shall comply with the latest revision of *Employer's* SHEQ requirement as stated in the Safety, Health and Environmental Specifications and all other *Employer* safety requirements.
- *Employer* compiles a baseline safety risk assessment to identify all the possible risks during the implementation of the project.
- The risk assessment includes all the mitigating strategies to minimize all the possible risks.
- *Employer* provides the *Contractor* with the baseline risk assessment to use it as a minimum requirement to compile a risk assessment identifying all the risks before the implementation

commences, the risk assessment compiled by the *Contractor* will clearly show all the mitigating strategies in order to minimize all the possible risks.

- No work shall be carried out without the risk assessment identifying all the risks and the mitigating strategies in place to address the identified risks.

- All necessary subsequent removal of existing installations shall form part of *Contractor* scope.

2.3.2 Safety of workers

- The *Contractor* ensures the safety of all persons working in the Site. Any hot work, including welding, will be applied for in accordance with the permit to work system. No welding will be allowed on site unless permission is granted in writing by the Project Manager.

- All welding, flame cutting and grinding work is properly screened to protect persons from arc flash or eye injuries. Fire blankets are fitted over the scaffolding planks and platforms.

- Precautions are taken to prevent any objects, welding or grinding splatter from falling.

2.3.3 Plant Safety Regulations

- The Employer, on request from the *Contractor*, isolates required plant from all sources of danger as described in the Plant Safety Regulations.

- The Project Manager, on request, makes available a copy of the latest revision of the Plant Safety Regulations to the *Contractor*.

- The *Contractor* complies with all rules and regulations applicable to plant safety and completes the Workman's Register prior to working on the plant.

- The *Contractor* declares any grinding and welding to be carried out on the workers register.

- At every permit change, the *Contractor* withdraws himself/herself/his staff for that period of permit suspension/revocation and thereafter only proceeds with the works after signing onto the new permit.

- The *Contractor* ensures that he/she/all Sub-Contractors/personnel/staff/his visitors are medically, physically and psychologically fit to enter Medupi Power Station and especially any confined space.

- The *Contractor* is prohibited from entering Restricted Areas.

- The responsibility is on the *Contractor* to ensure that the correct confined/hazardous space requirements and tests have been met and done by the Employer prior to entry into any confined space or hazardous plant areas.

- The *Contractor* ensures that all personnel are competent to carry out the works.

- The *Contractor* provides proof of competency for technical and safety aspects and must be available as and when required on site.

2.4 Environmental constraints and management

The mitigation requirements are recorded in the Environmental Management Plan (EMP). The *Contractor* shall acquaint himself fully with the contents of the EMP to ensure that the *Contractor* is fully aware of the requirements of the EMP and its implications on the works. The *Contractor's* rates tendered shall cover all costs that will be incurred to comply with all requirements of the EMP. Special attention is drawn inter alia to the following aspects:

- Site demarcation: The *Contractor* shall demarcate his camp site, be restricted to that specific area and take full responsibility to restore the area to its original condition before the contract commenced
- Waste management: The *Contractor* shall dispose of all waste off-site at a licensed waste disposal facility and submit proof to Eskom
- Sanitation: The *Contractor* shall provide an appropriate enclosed temporary sanitation facility not a bucket system
- Dust control: The *Contractor* shall be responsible to apply effective dust control measures
- Re-vegetation: The *Contractor* shall be responsible to re-vegetate the locations of trial pits, boreholes, roads and tracts through the veld, the camp site and any area of activity related to the works, as may be required
- Fire prevention: It shall be the responsibility of the *Contractor* to prevent veld fires at all times during the contract

The *Contractor* shall take full responsibility for protecting the natural environment and eliminating or minimising the negative impacts of construction on the environment during construction. Nothing specified herein shall relieve the *Contractor* of any obligations or responsibilities in this regard.

The *Contractor* shall implement an Environmental Policy, in line with various statutory regulations. The *Contractor's* Environmental Management Plan shall be submitted to the *Project Manager* within 14 days for review and acceptance after the awarding of the contract. Upon the *Project Manager*'s acceptance, the *Contractor* shall immediately implement the policy and any amendments and keep it in operation for the duration of the contract.

The *Contractor* shall keep the Environmental Management Plan updated in accordance with his Quality Management Procedures and make amendments as required by the *Project Manager* and the circumstances prevailing at the time. The *Contractor* shall immediately supply the *Project Manager* with a copy of an updated Environmental Management Plan which shall clearly indicate the revisions undertaken. The following documents shall be submitted and accepted by the environmental department before commencement of work:

- Environmental Policy
- Objectives and Targets
- Aspects and Impacts Register (related to scope of work)
- Operational Work Instructions (related to scope of work)
- Competency, training and awareness (including Training matrix)
- Waste Management Plan

2.4.1 General

The *Contractor* shall conduct his activities so as to cause the least possible disturbance to the existing amenities, whether natural or man-made, in accordance with all the currently applicable statuary requirements. Special care shall be taken by the *Contractor* to prevent irreversible damage to the environment. Disturbance or disruption of the daily lives of local communities shall be avoided.

The *Contractor* shall take adequate steps to educate his employees including Sub *Contractor*s the relevant environmental laws and regulations. The *Contractor* shall supplement these steps by prominently displayed notices and signs in strategic locations to remind personnel of environmental concerns.

2.4.2 Method Statements

The *Contractor* shall submit within 14 days after Contract Start date a Method Statement containing details for environmental protection measures proposed to the *Project Manager* for review and acceptance.

These shall include but not limited to:

- Site establishment layout
- Site drainage management
- Workshops' storage areas layout
- Pollution prevention measures
- Oil separator design (where applicable)
- Fuel storage and dispensing area and bund design (where applicable)
- Refuse dump design (where applicable)
- Temporary access roads (where applicable)
- Waste Management plan (where applicable)
- Chemical and Hydrocarbon Management (where applicable)
- Refuelling procedure or plan (where applicable)
- Environmental Incident Management plan (where applicable)

In addition, the *Contractor* shall provide detailed Method Statements on how he intends to carry out the *works*; this shall apply to all and any part of the *works* as provided in the *conditions of contract*

2.4.3 Temporary Services and Facilities

Temporary pipelines, power lines, telephone lines and other temporary services and facilities shall be located in a manner which will cause the least disturbance and disfigurement to the environment. Power lines shall be suspended below insulators and be of such design as to prevent the electrocution of birds to the greatest extent possible.

All fuel storage tanks shall be bunded to 110 % of the total storage capacity. Fuel dispensing areas and workshop areas shall be provided with concrete hard standing draining to oil separators. This will also apply to other areas with pollution potential.

Vehicle cleaning shall be undertaken in designated wash bays, which have an impermeable floor and are bunded to contain runoff and direct in onto a sump. Hydrocarbon/s be skimmed off the sump water and recycled or disposed of in the correct manner. Vehicle / plants with Emergency breakdown fixed outside the workshop or designated area; oil spillage control measures shall be in place such as drip tray and spill kit, to catch oil and diesel which may leak from the vehicles.

2.4.4 Refuse and Waste Control

The management of solid waste on Site shall be strictly controlled and monitored. Only licenced waste disposal landfill sites shall be used. The quantities of waste generated on Site shall be minimised.

Labelled recycling bins shall be used, and waste separated where possible. In addition, a recycled-material collection schedule shall be established and the bins shall be collected regularly.

Eating areas for the construction staff shall be designated and supplied with waste bins. No on-site burying or dumping or unauthorised burning of any waste materials, vegetation, litter or refuse shall occur. Bins provided will be sufficient to store the solid waste produced on a daily basis. The bins should be emptied at least once a day. Waste from bins may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof and which the *Project Manager* has accepted.

All solid waste shall be disposed of off site, at a licenced landfill site. The *Contractor* shall supply the *Project Manager* with a certificate of disposal. Waste shall be separated into domestic waste, building/construction rubble, scrap metal, oil and grease and hazardous waste and dealt with in the following manner.

2.4.5 Domestic Waste

Metal refuse bins to BS 792 or equivalent plastic refuse bins, all with lids, shall be provided by the *Contractor* for all construction sites. Refuse shall be collected and removed from all facilities on the Site at least twice per week. Domestic Waste shall be transported to the accepted refuse disposal site off site in covered containers or covered trucks.

2.4.6 Organic Waste

Refuse from food preparation and eating areas shall be collected and removed daily. Organic Waste shall be disposed of as per Domestic Waste and waste manifest supplied to the *Project Manager*.

2.4.7 Building/Construction Waste

Inert building/construction rubble shall be disposed at a nearest licenced landfill sites and waste manifest supplied to the *Project Manager*.

2.4.8 Scrap Metal

Scrap metal shall be disposed off-site at a nearest licenced scrap metal recycling facilities. Paper trail to be supplied to the *Project Manager.*

2.4.9 Used Oil and Grease

Used oil and/or grease shall be removed from site to a nearest licenced oil recycling company.

2.4.10 Hazardous Waste

All hazardous waste shall be disposed of in a licenced hazardous waste landfill site and waste manifest supplied to the *Project Manager*.

2.4.11 Protection of Flora

The removal, damage and disturbance of indigenous flora are prohibited. At the commencement of the contract, the *Project Manager* will identify to the *Contractor* indigenous flora or any rare or endangered flora that shall be preserved. The *Contractor* shall thereafter demarcate such and undertake all necessary measures to ensure the protection of such flora, including replanting and any special care required in accordance with the EMP. The use of herbicides is prohibited unless approved by the *Project Manager.*

2.4.12 Protection of the Fauna

The *Contractor* shall protect fauna living within the Site and shall ensure that hunting, snaring poisoning, shooting, nest raiding, or egg-collecting and disturbance does not occur. The *Contractor* is to ensure that his employees are instructed not to feed wild animals. The use of pesticides is prohibited unless accepted by the *Project Manager*. No domestic pets or livestock are permitted on Site.

2.4.13 Preservation of Topsoil

The *Contractor* shall remove and stockpile topsoil in accordance with the CEMP Section 3 - Clearing of site, or as directed by the *Supervisor*, in quantities sufficient for reinstatement, in accordance with the CEMP. Topsoil shall be removed from, inter alia, working areas (including quarry pits) and relevant areas of the Permanent Works, construction, haul and other access roads and such like, all as directed by the *Supervisor*.

2.4.14 Erosion Control and Storm-water Management

The *Contractor* shall include in the design of the works measures to prevent erosion resulting from his actions on the Site. The *Contractor* shall take appropriate and active measures to prevent erosion resulting from his works, operations and activities which shall be agreed with the *Supervisor* even when such potential erosion may take place or occur beyond the limits of the Site because of the actions of the *Contractor*.

Such measures shall include properly constructed watercourses, energy dissipaters, establishment of temporary vegetation as specified in the CEMP, to counter erosion and avoid discharges into water courses, wetlands, agricultural lands, etc.

2.4.15 Dust and Vehicle Emission Control

A dust control programme shall be implemented by the *Contractor* to maintain a safe and healthy working environment, minimise nuisance for surrounding residential areas, prevent damage to the natural vegetation of the area and protect topsoil. The *Contractor* shall take appropriate measures to minimise the generation of dust as a result of his works, operations and activities.

The *Contractor* shall prepare and submit a Dust Control Method Statement to the *Supervisor* within 14 days after the Starting Date. As a minimum, the statement should address the following:

- Schedule of spraying water on unpaved roads paying due attention to control of runoff
- Speed limits for vehicles on unpaved roads and minimisation of haul distances
- Measures to ensure that material loads are properly covered during transportation
- Schedule for wheel cleaning and measures to clean up public roads that may be soiled by construction vehicles
- Minimisation of the area disturbed at any one time and protection of exposed soil against wind erosion
- Reporting mechanism and action plan in case of excessive wind and dust conditions
- The control measures shall also include regular and effective treatment of gravel access roads and working areas, use of dust extractors on drilling equipment or wet drilling, use of personnel protective equipment, etc.

Vehicles emitting noticeable diesel fumes will not be permitted to continue working on Site. Vehicle emissions shall be monitored on a regular and on-going basis in order to ensure that vehicles working on Site comply with legislated requirements.

2.4.16 Noise Pollution

Having due regard for local communities and dwellings, the *Contractor* shall restrict any of his operations which result in undue noise disturbance to those communities and dwellings to the hours of 06:00 to 18:00 on weekdays or otherwise as agreed with the *Project Manager*. The *Contractor* shall not use sound amplification equipment on Site unless in emergency situations. The *Contractor* shall ensure that environmental awareness and training for all employees includes the need to minimise noise. The *Contractor* shall provide suitable ear protectors to all of his staff and others entering areas with high noise levels. Zones of risk shall be clearly identified with warning signs.

The *Contractor* shall provide and maintain equipment to measure noise levels in accordance with SANS 10083. The *Project Manager* may from time-to-time instruct the *Contractor* to carry out more frequent testing of noise levels. Furthermore, he may require the *Contractor* to carry out testing in other areas of the Site. The *Contractor* shall keep records of all noise level measurements for the duration of the contract. These records shall be submitted each month to the *Project Manager*, or on the request of the *Project Manager.*

2.4.17 Natural Features and Heritage Resources

The *Contractor* shall not deface, paint, damage or mark any national features (e.g. rock formations) situated in or around the Site for survey or other purposes unless accepted by the *Project Manager*. Any contravention of this Sub-Clause will require the item to be restored/ rehabilitated at the *Contractor's* cost. The *Contractor* shall ensure that should any archaeological finds be made during the construction excavations; the *Contractor* shall inform the *Project Manager* immediately in order to reach agreement regarding proper procedures to minimise damage and or effect salvage operations of the findings. All heritage resources to be affected by the Project shall be treated and managed in accordance with the National Heritage Resources Act 25 of 1999 and the National Monuments Act 28 0f 1969.

- Remedial action in the event of non-compliance
- Implementation and management of environmental protection measures
- Reporting of environmental incidents and routine reporting of environmental activities

No measurement or payment will be made against any items for the rehabilitation of the *Contractor's* working and accommodation areas (including the areas designated for the *Supervisor's* use) or for rehabilitation of areas used for temporary roads. No overhaul will be paid for work within the Site.

2.5 Quality assurance requirements

All Quality Management System requirements shall comply with QM-58 Category 2. The *Contractor* shall be responsible for the quality of and testing of materials, workmanship and production processes used in completing the works. Within fourteen (14) calender days after Contract Date, the *Contractor* shall submit to the *Project Manager* the Quality Management Plan for quality control and quality assurance of the *work*s.

Where the *Contractor* maintains an accredited Quality Control System, details of the level of the *Contractor's* self-certification procedures shall be adopted in respect of supplied materials shall be agreed with the Quality Representative or *Supervisor* prior to commencement of work. Where no accredited Quality Control System exists, the *Contractor* shall plan all quality management procedures, carry out all quality control testing as required and shall make available records of such testing for the Quality Representative or *Supervisor's* acceptance.

The *Contractor* shall submit full details of the proposed quality management system and procedures for acceptance by the Quality Representative or *Supervisor*, who shall have full access to all records, Site trials and tests. The *Contractor* shall ensure that monitoring and measuring equipment are calibrated and verified to confirm serviceability prior to usage, records of such shall be kept on Site.

The *Contractor* shall submit prior start of site activities, a method statement together and the quality control plan or inspection plan and test plan for review and acceptance by the *Supervisor.*

The *Contractor* shall comply with QM58 requirements for the duration of the Contract. On completion of the project, the *Contractor* shall submit data books (Packs) before the Completion Certificate can be issued. The Data Packs shall be in accordance with the Data Packs Specification provided in this Works Information.

- The *Contractor* conforms to the following Quality Management requirements:
    - The quality requirements are as per ISO 9001:2008.
    - Quality Control Plans shall be in the format of Document Identifier 240-1443182036 “Medupi Power Station: Quality Control Plan form”.
- Documents submitted for review and acceptance by the Project Manager 30 days after the Contract Date and prior to the commencement of work.
- The *Contractor* submits a full detailed Contract Quality Plan for acceptance within 30 days of the Contract Date.
- No site work and designs are allowed unless the *Employer* accepts the QCP and QIP’s.
- The *Contractor* utilises the Employer’s quality documentation forms for requesting access, erection checks etc. These request forms must be submitted to the Supervisor at least 72 hours notification for off-site but local (within the country), 15 days if offshore and 24 hours for on-site inspections. This will be coordinated by the quality team and the Supervisors.
- Apart from any statutory data packages required, the *Contractor* also compiles a data package (books) of the relevant drawings, test certificates etc. for each section of work which must be reviewed and signed off by the Supervisor at erection check phase prior to the commencement of the commissioning phase.
- The *Contractor* is responsible for defining the level of QA/QC or inspection to be imposed on his Sub-Contractors and suppliers of material. This level should be based on criticality of equipment and be submitted to the Project Manager for acceptance in the form of a QCP.
- The Contractor submits a schedule of un-priced orders to be placed that is updated monthly.

- The *Contractor* submits a quality report on a monthly basis, including the following: o A list of Defects with those older than 30 days being flagged, and an explanation attached.

    - Monthly updated Site and pre-site programme.
    - Foreign inspection dates.
    - Inspections completed/outstanding.
    - Register of accepted Defects.
    - Non-conformance Reports, Corrective Action, Preventative Action and Concessions Reports.
    - Copy of all work instructions and procedures when requested by the Project Manager.
    - The Employer carries out random and scheduled inspections on the plant.

2.6 Programming Management

2.6.1 General

The *Contractor* submits a Resource Loaded Detailed Level 4 single integrated programme which includes of his Sub*Contractor*s, Suppliers with interface points between the different Sub*Contractor*s and the *Contractor* clearly identified. The *Contractor* shall manage the interfaces between his Sub*Contractor*s and Others working on the same Site.

2.6.2 Computerised Planning and Reporting

The programme shall be submitted in Primavera P6 Schedule (XER) format for ease of transfer and presentation. The *Contractor* obtains this software and makes use of it for planning and control of the works.

2.6.3 Project Calendar

The project calendar includes working days (Monday to Friday) and excludes non-working days which are weekends (Saturday to Sundays) and Public Holidays. The *Contractor's* programme and any subsequent revisions shall take into account non-working days. If and when the *Contractor* deems any period in a calendar year as a non-working days, e.g. pay weekends, etc. all such shall be declared up front and agreed with the *Project Manager* in the first construction program for acceptance by the *Project Manager*. Failure to declare these days shall render any later declaration as null and void and the *Contractor* shall provide the works as per the accepted first programme.

2.6.4 Sequencing of the *works*

The *Contractor* shall sequence the works as per *Contractor's* accepted programme.

2.6.5 Additional Programme Requirements

The *Contractor* shall use the Critical Path Method (CPM) technique for programme and planning and shall submit the programme basis document to the *Project Manager*. The programme basis document describes the programme and planning methodology, format, project execution philosophy, resource assumptions, qualifications and any other items that may have a substantive impact on the schedule. The programme layout takes into account the Key Dates provided above and the Work Breakdown Structure (WBS). The following levels of programme are to be used for this project for dynamic integrated project control:

- Management level programme (Level 1)
- Project level programme (Level 2)
- Control level programme (Level 3)
- Discipline speciality programme (Level 4)

The *Contractor* submits a Resource Loaded Level 4 Detailed Programme with the tender documentation. The Level 4 Detailed Programme is to be submitted within one month of contract award for review and acceptance by the *Project Manager*.

2.6.6 Management Level Program (Level 1)

The management level programme is used to establish work goals and overall time frames for the works. It is a statement of project objectives recorded in graphic form. The management level programme defines and establish goals or major milestones key dates. The duration of major operations and their relationship to one another. Identified Long Lead material items. Responsibility assignments for accomplishing project objectives

2.6.7 Project Level Program (Level 2)

The project level programme is prepared representing the significant work activities and deliverables associated with the works. The end product is a time scaled bar chart schedule developed through use of a logic network. This programme is separated by work areas, by Phase and by WBS. A "rolled up" programme from the control level programme is produced. It is separated by each work activity and by Phase (for example: Engineering, Procurement, Construction and Commissioning)

2.6.8 Control Level Program (Level 3)

The work within each work area is broken down by Engineering Discipline, Procurement of Tagged equipment and Bulks, Construction, and Commissioning & Start-up. The control level programme is resource-loaded. It forms the basis for progress measurement, progress curves and histograms for each discipline within a work area.

2.6.9 Discipline Speciality Program (Level 4)

This level typically represents day-to-day tasks which are work activity based and become summarised in the Level 3 activities. Resource information for manpower, Plant, Material and Equipment and reflected in the resource histograms is to be provided by the *Contractor*. Staffing Histograms are to be submitted based on “equivalent personnel”. Available work hours take into account 4 and 5 week months and statutory holidays that may occur. Staffing histograms is updated with actual data for each reporting period and re-forecasted as required should significant deviations occur.

2.6.10 Submission of Revised Programmes and Progress Reporting

The *Contractor* submits one electronic copy in Primavera P6 (XER) format, of each revised programme and progress report to the *Project Manager* for acceptance. The *Contractor* submits revised programme on monthly basis or as instructed by the *Project Manager*. The monthly reports shall comply with the progress reporting requirements as stated below.

2.6.11 Weekly Status Reports

A weekly status report is submitted by the Contractor to the Project Manager. This report is less formal than the monthly report and is used as a tool for the day-to-day management of the project. Contents of a weekly report will include the following items:

- The updated Primavera programme
- Programme summary narrative
- Progress and performance summaries
- Sectional Completion and Key Milestone status

2.6.12 Monthly Progress Report

The contents of the report may vary from month to month depending upon the phase of the project and/or the items of management focus. However, the basic framework of the report consists of the following:

- Executive summary (narrative identifying major movement within the reporting period)
- Revised Programme indicating, actual progress of work against last Accepted Programme
- A one-month look ahead work window
- Activities completed, activities in progress during current reporting period and Critical Path activities report
- Key issues and risks of concern and mitigation actions
- Cost and Cash flow and Cost curve 'S-curve'.
- Early warning and Compensation Event Register
- Report selecting all of the activities of the *Employer* and Others - (computer generated).
- Resource Schedule Histogram
- Forecast Rate of payment schedule updated with actual progress
- Statement and report on works ahead and behind progress
- Procurement plan for all Resources (labour, equipment, plant and material) in Excel Format. The plan shows mobilisation per month, equipment, people, plant and materials for the duration of the contract
- VDSS

2.7 *Contractor*'s management, supervision and key people

The appointment of key personnel shall be in terms of Clause 24 of the ECC. The *Contractor* as a minimum shall nominate a Director / Senior Manager, a Contract Manager and a Site Manager, subject to the acceptance of the *Project Manager*.

The *Contractor* is also required to submit a organogram of all key persons including his Sub*Contractor's* at tender stage and after contract award. The organogram submitted must include the following key persons as a minimum subject to the acceptance of the *Project Manager* after contract award.

- *Project Manager*
- Site Construction Manager (Full-time on site)
- Engineer
- SHE Officer (Full-time on site)
- *Supervisor* (Full-time on site)
- Quality Officer (Full-time on site)
- Planner

2.8 Payment

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* submits a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate. The invoices must be send to Finance Shared Service email address invoiceseskomlocal@eskom.co.za

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager*
- The contract number and title
- *Contractor's* VAT registration number
- The *Employer*'s VAT registration number 4740101508
- Description of service provided for each item invoiced based on the Price Schedule
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT

2.8.1 Schedule of Actual Costs and Accounts

The *Contractor* shall submit a detailed monthly schedule of his actual costs with all the necessary backup information at the monthly measurement meeting, for review by the *Supervisor*. The various schedule items as detailed in the Schedule of Cost Components, shall be submitted in a spreadsheet format, itemized in terms of People, Equipment, Plant and Materials, charges, and manufacture and fabrication. Schedule items shall be grouped into work area activities as outlined in the *activity schedule*, with such work area activity groupings referenced against the *activities schedule* item numbering.

Before each successive monthly measurement meeting (i.e. on a weekly basis), the *Contractor* shall submit to the *Supervisor* all current (or cumulative to that assessment date) backup documentation for acceptance. Backup documentation shall include, but not limited to: all calculation sheets, citing each completed task and item in the Bill of Quantities, drawings, etc.; acceptance of completed work payment purposes, including confirmation of attainment of each criteria set out either in the specification or any other document which this contract prescribes.

Following the monthly measurement meeting, the *Contractor* shall present a detailed final schedule (with revisions agreed to at the monthly measurement meeting incorporated), including the necessary backup documentation, to the *Supervisor* for final checking.
Once accepted by the *Supervisor*, he will submit it to the *Project Manager*. This will then be used by the *Project Manager* to assess the amount due in terms of Clause 50 of the ECC.

The final format and layout of this monthly schedule as well as the level of detail of backup information required are to be agreed between the *Project Manager* and the *Contractor*. Clause 52 of the ECC shall apply in terms of accounts to be kept by the *Contractor* to verify the above monthly schedule of actual costs.

2.8.2 Records and Returns

This Section relates to the preparation and submission of records and returns by the *Contractor*, to be submitted to the *Supervisor* in a form that is acceptable to him.

- At Start Up of the works
- Prior to First Commencement of a Particular Work Activity
- On Completion of a Work Activity or Part Thereof
- Daily
- Weekly
- Monthly
- On Completion of the works

2.9 Training workshops and technology transfer

Training of the *Employer*'s operating, maintenance, and engineering personnel on the operation of the systems shall be provided by the *Contractor*. Training shall consist of both basic and advanced training and shall focus on skills development. The *Contractor* shall submit the training manuals, guides and schedules for the review and acceptance by the *Project Manager*.

The *Contractor* shall prepare five (5) training sessions for Operating, Maintenance and Engineering as a group. The operating personnel is working shifts and therefore the *Contractor*s shall on the training schedule

make an allowance for five training sessions in order to cover all the operators. At the completion of the training, plant operating personnel shall be able to apply knowledge of plant process

- The *Contractor* shall provide training on all equipment included as part of the Works to the various categories of the Employer's technical staff for the duration of the Works.
- The objective of the training is to provide the Medupi Power Station staff with the necessary skills and knowledge to achieve all the plant performance targets with respect to safety, maintainability, availability, reliability and economic plant operation.
- The *Contractor* shall provide all formal training courses for the maintenance staff at Medupi Power Station.
- Facilities for training will be provided by the Employer at Medupi Power Station and will be a suitably sized air-conditioned room, to accommodate the trainees / trainer as well as trainee and trainer desks, a projector and flipchart or white board.
- Practical hands-on training for each individual trainee shall form the training.

3 Scope of Work

- The project includes the replacement of the current GE and Siemens PIS with the new alternative solution available on the market. This replacement is applicable for unit 1 – 6, BOP and SER at Medupi power station**.**
- The *Contractor* shall provide, as part of the Works, a Plant Information System (PIS) that is a central database repository for the long-term storage of all plant information produced at Medupi Power Station. This shall include plant information generated by the Contractor's control and instrumentation systems, Others Project Contractor's (such as the Turbine Control & Protection system, Generator Condition Monitor, Boiler Plant Health and Condition Monitoring calculator, H2 plant, N2 plant and Laboratory etc.), as well as other sources identified by the Engineer. The final list of systems that will be incorporated in the PIS shall be clarified and finalised during the system engineering phase. The PIS shall include all modules for the analysis of all the plant information including alarm data, SOE and all control and instrumentation system calculated variables.
- The *Contractor* shall engineer and configure on the PIS clients as part of the works all process graphics and trends available on the Operator Workstations.
- The system shall be used for the remote access and retrieval of near real-time and historical plant information by the PIS Clients. The station PIS shall provide easily accessible information for power plant technical services such as operating, maintenance, and engineering.
- The *contractor* is required to include cybersecurity protection services according to the relevant cybersecurity standards. *Contractor* is also responsible for the DMZ highway.
- The scope of this project includes all activities related to the supply, delivery, offloading, storage, and installation of all the necessary resources to complete the works in all respects.
- The Completion of the works is only accepted by the *Employer'*s representative upon the successful commissioning and handover by the Contractor of a fully installed PIS at Medupi power station upon verification of all statutory and operational requirements, whether stated or not stated in this document.
- Unless stated otherwise the *Contractor* supplies all labour as well as plant and materials, equipment, installation, and supervision required for the manufacturing, packaging, delivery to site, offloading, storage, assembly, and installation of all the equipment.
- It is the responsibility of the *Contractor* to verify all the information including dimensions, distances given by the Employer in order to ensure the supplied solution complies with all the standards and specifications.

3.1 Additional Requirements Related to the Works

- In addition to the above requirements, the following requirements are applicable to the works under this scope of works:
  - Procurement, supply, delivery, offloading, storage, installation, commissioning and handover of the complete solution.
  - The *Contractor* decommissions and removes the current PIS servers and hand them to the Employer's representative (Eskom).
  - The *Contractor* supplies, installs, and commission the new PIS once approved by the Employer's representative.
  - The *Contractor* ensures that the approved design for the new PIS is commissioned and the testing on the system for correct functionality, according to statutory and operational requirements as well as industry best practice.
  - All equipment supplied and installed shall be accompanied by factory acceptance tests, site acceptance tests, equipment specifications, equipment compliance certificate and installation certificate of compliance for the whole system.
  - The *Contractor* is Responsible to ensure that every effort is made to keep to the agreed program and plan.
  - The *Contractor* shall ensure timeously inform the Employer of any delays or when outstanding or additional information from the Employer is required.
  - Provision to be made for delays that may be caused owing to items being sourced from outside The Republic of South Africa
  - The *Contractor* is responsible to ensure that a quality product is delivered.
  - The *Contractor* shall provide all required technical datasheets and/or product technical information.

3.1 Site location

Medupi Power station is situated approximately 20 km west of the Town Lephalale in the Waterberg region of the Limpopo Province and approximately 350 km North of Johannesburg.

3.2 Specific Requirements

3.2.1 General System Description

A Plant Information System (PIS) in Medupi Power Station allows near real-time and historical plant information to be available to users and other third-party software applications. It provides a common and consistent source of data, which is used for monitoring the plant and analysing plant performance. This includes data generated by all process control systems, as well as any other relevant plant data from other sources.

It stores plant information on 2 redundant PIS Data Servers. The PIS Data Servers archive all the plant information transmitted to and generated by the various control system servers and are used to supply information to all Clients connected on the Station Office LAN.

3.2.2 Main Functions

The PIS is a central database repository for the long-term storage of all plant information produced at Eskom Power Station. This includes:

- All plant information generated by the Distributed Control Systems (DCS),

- Other relevant control and instrumentation systems interfaced to the DCS (Examples include the Turbine Control & Protection System, Generator Condition Monitor, H2 Plant, N2 Plant, Water Treatment Plant, BOP, Chemistry Analyser Network, etc.),

- Other sources identified during the clarifications.
- The PIS also includes all modules for the analysis of all the plant information including:

    - Alarm data,
    - Sequence of Events (SOE),
    - Field and other system's readings (inputs and outputs),
    - Control and instrumentation system calculated variables, control variables, and system settings,

- Operator inputs (key logging).
- The system is also used for the remote access and retrieval of near real-time and historical plant information by the PIS Clients
- Reporting and production data verification
- The system also provides the function of replicating the mimics as is on the operator stations.

3.1.2 Functional Interfaces

The system interfaces with the existing interfaces but not limited to:

- **DCS (ALSPA DCS Series 6 & SPPA-T3000)**
- **Eskom LAN**
- **Third party applications through OPC communication**

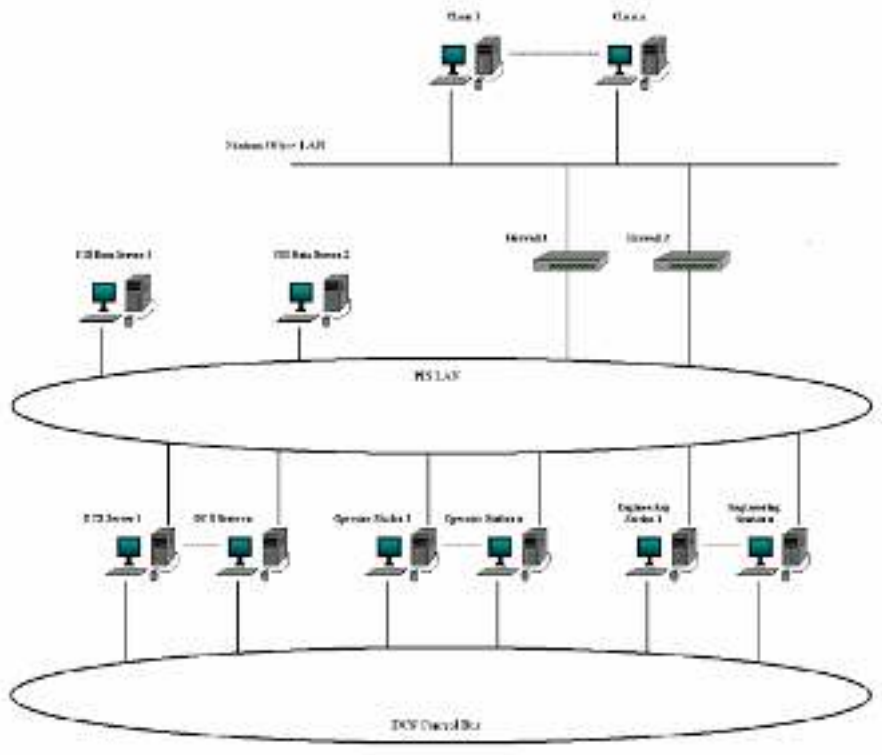

Figure 1: General Architecture of PIS and its interfaces.

3.3 Requirements

3.2.1 Plant Information Storage

- The PIS shall store the plant information for all Power Islands and the Balance of Plant on fully redundant physically separated servers. The redundant PIS data server shall be physically separated from the control and instrumentation system servers. Engineering and diagnostic workstations and operator workstations and shall be provided by the Contractor as part of the Works. A one-million tag PIS licence shall be provided by the Contractor.

- The PIS shall store all data, including:
    - Alarm data (ability to run alarm KPI reports on all of the DCS rings, BOP, SER and Units 1-6.
        - Standing alarms
        - Alarm Floods / Rate
        - Chattering Alarms),
    - SOE,
    - Field and other system's readings (inputs and outputs),
    - Control and instrumentation system calculated variables,
    - Control and instrumentation system control variables,
    - Control and instrumentation system settings,
    - Operator inputs (key logging),
    - Analogue signal data,
    - Digital signal data.

    - The PIS shall be able to store all analogue tags with a precision adjustable from 0,1% to 10,0% in the Historian. The average precision for all analogue tags together shall be 0,5%. All events shall be recorded upon state changes with a timestamp resolution and accuracy of 1 s or better. The PIS data servers shall store a minimum of 5 years of all historical plant information on-line at maximum resolution for access by the PIS clients. The PIS shall store all analogue, digital, calculated and control variables.

    - The PIS shall be able to back-up the historical plant information stored on the PIS data servers to external hot-swappable SDDs automatically, while on-line and without any loss of availability and functionality of the PIS. External hot-swappable SDD's shall be supplied by the Contractor for 5 years of off-line data, as part of the Works. The PIS shall not lose any data even under the most extreme situation such as a multiple unit trip.

3.2.2 PIS Client Interface

The *Contractor* shall supply, as an integral part of the Works, web server software that allows the PIS clients, with the appropriate user rights and a standard Internet Browser as well as standalone software applications that can be installed locally on the PCs, to view all the real-time and historical plant information from the PIS in the form of:

- trends (y = f(t)),
- plots (y = f(x)),
- chronological lists,
- reports (automated that can be scheduled and sent via email / publish a link to download via email),
- Reports,
- user customizable process graphics,
- user configurable trends and reports (to be setup for personalised standard trends),
    - user friendly extraction of data by users,

The design and engineering of web pages that supply the real-time and historical plant information from the PIS to the PIS clients shall be provided. A minimum of 150 PIS clients shall be able to access all real-time and historical plant information from the PIS simultaneously.

3.2.3 Eskom Lan Interface

The Plant Information System shall connect to the station business LAN through a redundant firewall. The supplier shall provide the appropriate firewall, hardware/software to ensure proper operation and communication.

The *Contractor* shall install and supply all optic fiber cabling required connecting to the station business LAN and all necessary associated equipment such as connection boxes and switches. All bus cable jointing, splicing and termination forms part of the Works.
The *Contractor* shall assess the cable routes at site and provide full details for the Engineer's approval.

3.2.4 Redundancy

The PIS data servers shall be fully redundant. In the event of a failure of one of the PIS data servers, the redundant PIS data server shall automatically take over its functions, without any loss in availability or functionality of the PIS. When the failed server is returned to service it shall automatically update and realign itself with the master server. The PIS servers shall synchronise all data continuously to ensure no data loss or corruption of data in case of a server failure.

All interfaces to the PIS shall be fully redundant. There shall be no single point of failure. The failure of any single component (for example, a switch, a NIC, a cable, or a firewall) shall not result in any loss of functionality or availability of the PIS. The PIS network architecture shall be designed such that the redundant PIS data servers can be physically separated and located at any two nodes on the network.

3.2.5 Time Synchronisation

The PIS data servers shall be synchronized with the GPS system supplied as part of the Works.

3.2.6 Security

- A user shall be requested to enter a username and password, before being able to access the configuration and diagnostic software of any PIS component.

3.2.7 PIS Database Structure

- The databases on the PIS data servers shall hold all plant data and shall be open to the queries from the control and instrumentation system data servers and the PIS client. The database structure shall be modifiable to fit the needs of Medupi Power Station.
- Any changes made to the database shall be made in real-time and on-line, and all changes shall be effective without restarting any part of the system.
- The PIS shall make real-time and historical plant information available to third party applications through OPC-UA communication. All the PIS databases shall be accessible by third party software applications on the PIS clients by means of SQL queries. These third-party software applications shall be able to read data from all the PIS databases.

    - **ODBC Interfacing**

All PIS Databases on all servers shall be supplied with a suitable ODBC driver. This driver shall allow any application that is able to connect to a PIS Database using ODBC to access data on any server. A database shall successfully process any standard ANSI 92 SQL and transact SQL compatible query sent by a remote application through the ODBC driver.

    - **Database Manager**

All third-party programs shall be able to access all databases through a database manager. The third-party applications shall only be able to read data from the databases. The primary relational database management system (RDBMS) shall use an industry standard interface and query tools. The chosen

database management system shall be compatible with the ANSI 92 SQL and transact SQL. All databases residing on all the data server(s) shall be connected to the RDBM. An indexed database server shall exist on the data server(s). It shall hold an index of all data on all databases on the PIS. If a user requires specific data, it shall not be necessary to know on which server the data resides. The user shall only have to connect to a single indexed database server, which shall send the requested queries to the appropriate server or database that holds the data that is required.

- **Data Integrity**

The PIS shall clearly indicate and store abnormal data in a clearly identified way. Calculations and programs utilizing abnormal data (e.g., incorrect, disturbed, out of range etc.) shall appropriately and intelligently distinguish the state of the data and shall act to eliminate any incorrect or misleading effect in all related calculations.

3.2.8 Reports

As a minimum the following reports shall be created and generated by the Plant Information system on a regular basis:

- Alarm log
- Hourly log
- Daily log
- Shift log
- Operating log
- Incident review logs
- Running time and status change log
- Calculated points
- Summary logs
- C&I Fault log
- Statistical evaluation reports
- Special Dust and Pollutant Emission reports
- Water Mass Balance Report
- CPP, Regeneration and Demineralisation Reports
- Metering reports as specified in the technical guideline, 241-202275 in Appendix C – Project Standards.

All reports generated by the Plant Information System shall be viewable on all PIS Clients. The final list of reports generated by the PIS shall be clarified during the system engineering phase.

The PIS shall automatically create and transmit the generator energy data report over FTP to the Employer's Phoenix Server as defined in the technical guideline, 241-202275 in Appendix C – Project Standards.

3.2.9 Local Area Network (LAN)

The PIS LAN shall be an Ethernet network that conforms to IEEE 802.2 and IEEE 802.3. The PIS LAN shall use the TCP/IP protocol and shall be able to operate at a speed of up to 1000 Mbps at any point on the LAN. The PIS LAN shall be compatible with slower equipment that may be connected to it. Fibre optic cables shall be used throughout to prevent interference as well as performance degradation of the PIS LAN. The PIS and the PIS LAN shall consist of Gigabit Ethernet switches and routing switches. The switches on the PIS LAN shall have remote management capability, as well as a spanning tree algorithm compatible with IEEE 802.1W to protect against unwanted network loops.

3.2.10 Fault Tolerance

No single point of failure shall exist on the PIS LAN that could be the cause of failure of any part of the PIS. A failure in any fibre link, switch, process server, or Client shall not cause the failure of any other process server, data server or any other Client. There shall be no loss of data due to any single fault. Store and forward concepts should be provided to automatically recover from short term system faults.

3.2.11 Historical Data

Upon project completion or refurbishments, the new PIS shall be able to import the historical data from the existing PIS. This shall include data from existing process computers, standalone Historians, paperless recorders etc. The historical data imported into the new PIS shall, as far as practical, be able to be used seamlessly with the new data received from the plant. If seamless integration is not possible, the existing historical data shall, as a minimum, be available for export to other applications such as Microsoft Excel® for manipulation. This historical data shall also be stored for the life of the plant.

3.2.12 Hardware

All computers used in the PIS shall use microprocessors with the x86 architecture. In addition to this, the computers shall not be blade servers. Devices that form part of the PIS shall be consistent with the latest Eskom approved technology. Servers shall comply with the relevant Eskom's Information Security Policy, and other related standards with regards to aspects such as Security, Firewalls, External and Remote Access etc. Client machines shall be compatible with Eskom's latest Group Policy Image.

3.2.13 Old Data Files Removal

The PIS shall include features to automatically remove old data files (files more than 5 years old in the system) to a different hard drive to ensure that the storage on the main hard drive does not get full.

3.3 General Scope Of Work

- The project includes the replacement of the current GE and Siemens PIS with the new alternative solution available on the market. This replacement is applicable for unit 1 – 6, BOP and SER at Medupi power station.

- The *Contractor* shall provide, as part of the Works, a Plant Information System (PIS) that is a central database repository for the long-term storage of all plant information produced at Medupi Power Station. This shall include plant information generated by the Contractor's control and instrumentation systems, Others Project Contractor's (such as the Turbine Control & Protection system, Generator Condition Monitor, Boiler Plant Health and Condition Monitoring calculator, H2 plant, N2 plant and Laboratory etc.), as well as other sources identified by the Engineer. The final list of systems that will be incorporated in the PIS shall be clarified and finalised during the system engineering phase. The PIS shall include all modules for the analysis of all the plant information including alarm data, SOE and all control and instrumentation system calculated variables.

- The *Contractor* shall engineer and configure on the PIS clients as part of the works all process graphics and trends available on the Operator Workstations.

- The system shall be used for the remote access and retrieval of near real-time and historical plant information by the PIS Clients. The station PIS shall provide easily accessible information for power plant technical services such as operating, maintenance, and engineering.

- The *Contractor* is required to include cybersecurity protection services according to the relevant cybersecurity standards. Contractor is also responsible for the DMZ highway.

- The scope of this project includes all activities related to the supply, delivery, offloading, storage, and installation of all the necessary resources to complete the works in all respects.

- The Completion of the works is only accepted by the *Employer's* representative upon the successful commissioning and handover by the *Contractor* of a fully installed PIS at Medupi power station upon verification of all statutory and operational requirements, whether stated or not stated in this document.

- Unless stated otherwise the *Contractor* supplies all labour as well as plant and materials, equipment, installation, and supervision required for the manufacturing, packaging, delivery to site, offloading, storage, assembly, and installation of all the equipment.

- It is the responsibility of the *Contractor* to verify all the information including dimensions, distances given by the Employer in order to ensure the supplied solution complies with all the standards and specifications.

3.3.1 Additional Requirements Related to the Works

In addition to the above requirements, the following requirements are applicable to the works under this scope of works:

- Procurement, supply, delivery, offloading, storage, installation, commissioning and handover of the complete solution.

- The *Contractor* decommissions and removes the current PIS servers and hand them to the *Employer*'s representative (Eskom).

- The *Contractor* supplies, installs, and commission the new PIS once approved by the *Employer*'s representative.

- The *Contractor* ensures that the approved design for the new PIS is commissioned and the testing on the system for correct functionality, according to statutory and operational requirements as well as industry best practice.

- All equipment supplied and installed shall be accompanied by factory acceptance tests, site acceptance tests, equipment specifications, equipment compliance certificate and installation certificate of compliance for the whole system.

- The *Contractor* is Responsible to ensure that every effort is made to keep to the agreed program and plan.

- The *Contractor* shall ensure timeously inform the Employer of any delays or when outstanding or additional information from the Employer is required.

- Provision to be made for delays that may be caused owing to items being sourced from outside The Republic of South Africa

- The *Contractor* is responsible to ensure that a quality product is delivered.

- The *Contractor* shall provide all required technical datasheets and/or product technical information.

3.4 Design Standards, Guidelines And Codes

- The *Contractor* shall obtain his own copies of International and National standards.

- The *Contractor* shall report any conflict within this specification, with any referenced standards, specifications, or technical guideline.

- This specification shall take precedence over differences existing between this specification and any document except for statutory requirements.

- Substitutions of any standard shall be approved by the Employer. Additional standards proposed by the Contractor shall be submitted to the Employer for approval.

- Only the most recent versions of the relevant standards, guidelines, or codes shall be used with this Works.

3.5 Basic Engineering

3.5.1 General Requirements

- Basic engineering is defined as being all activities necessary to clearly identify the Contractor's scope and design for the Plant Information System solution.
- The basic engineering activity shall include the Contractor's interfacing and participation with the Engineer, Employer personnel and Other Project Contractors through clarification meetings in order to reach the basic design freeze (DF) completion.
- As a minimum, basic engineering shall consist of the following activities: Concept designs – during which the rules, philosophies and concepts followed in the various engineering and design activities, are clearly defined, clarified and approved.
    - Investigation work – during which the *Contractor* conducts his investigation work.
    - Scope definition – during which detailed scope definition and clarifications are performed

- During the *Contractor's* investigation work, the Contractor shall take responsibility for collecting all information from the Employer to enable the Contractor's design to be completed.

- The *Contractor* shall identify any discrepancies that would lead to shortcomings and/or deviations in the Works and shall make the Employer aware of such discrepancies and provides recommendations, where applicable. The Contractor takes action on such discrepancies.

- Any discrepancies identified are redlined by the Contractor and submitted to the Employer for approval.

- Technical clarification is where the *Contractor* shall clarify with the Employer and Other Project Contractors all the technical issues to permit the Contractor to start detailed engineering.

- All equipment having long delivery times shall be planned and technically clarified early in the technical clarification stage to allow early Detailed Engineering to commence in parallel.

- The *Contractor* shall be responsible for maintaining the minutes of the meetings, a deviation schedule and list of open points (LOP) for all engineering activities and shall record all changes to scope during the basic engineering phase.

- Where the *Contractor's* system interfaces to 3rd party systems (including electrical and civil interfaces provided by others), the Contractor shall coordinate, through the Employer, with Other Project Contractors and design the interface to ensure the overall design is complete and well-engineered.

3.6 Detailed Design

3.6.1 General Requirements

- Detailed engineering is defined as being all activities required to translate the Contractor's scope and design into a fully functional Plant Information System.

- As a minimum, detailed engineering shall consist of the development, technical clarification and acceptance of the documents defined in as being required for the Detailed Engineering design.
- An independent plant system (independent from the operator information system) shall be provided for the recording and archiving of plant data over the lifetime of the plant. The data shall be stored such that historical information can be retrieved from the database using multiple search criteria, including plant area, time & date, variable limits.
- The system shall have links to external plant-wide information system, with appropriate security against data corruption, unauthorized access, and spread of computer viruses. It furthermore provides storage of the data for online access for a minimum of six months.

- Front-end application software and local area network software for all clients on the Station LAN requiring access to historical data shall be provided. This software runs under standard Windows XP or higher on office computers and communicates with the plant 110 information system via the Station LAN. All data is available using a web server software and a standard Internet browser.

3.6.2 Data Export, Interface and reporting requirements

- Search and export data per Start-, End date, Unit, KKS, KKS description to External source like Microsoft Excel.

- Ability to query data directly from Microsoft Excel by means of an Excel add-in or alternatively directly by using Microsoft Excel Power Query Functionality.

- Ability to interface with Modern Microsoft packages like Power Bi (Read data only).

- Ability to create and save custom reports, calculations based on data retrieved per period, Unit, parameters should be possible in the creation of the reports.

- Ability to Generate the reports based on fixed intervals, example, daily, monthly, weekly, yearly or when specific event occurs like a Unit trip.

- Ability to e-mail generated reports to an e-mail list on specific intervals, daily, weekly, monthly, yearly or specific defined events.

- The end-User should have the ability to create and save custom plant overview screens and save them for plant monitoring purposes.

- Ability to extract data of different variables at synchronized time intervals into a continuous table format.

- Ability to extract data from different sources in the same report, e.g., MW Generated on all units.

3.6.3 Data Trending Requirements

- Ability to trend minimum 8 trend parameters per trend graph.

- Trend per start-, end date, Unit, KKS, KKS description.

- Ability to save trend groups, example Unit 1 Mill 10 trend consisting of a group of parameters related to Unit 1 mill 10.

- Configuration of trend colors and markers should be possible.

- Ability to Export selected portion of trend to external source like Microsoft Excel.

- Ability to configure trend parameter either as line or Bar chart / trend.
- Statistical information per selected period should be made available, mean, standard deviation, sum, range.

- Ability to create x-y / scatter plots.

- Ability to trend data from different sources on the same trend, e.g MW Generated on all units.

3.7 Engineering And Contractor's Design

3.7.1 General Requirements

- The scope of this project includes all activities related to the supply, delivery, offloading, storage, and installation of all the necessary resources to complete the works in all respects.

- The Completion of the works is only accepted by the Employer's representative upon the successful commissioning and handover by the Contractor of a fully installed PIS at Medupi power station upon verification of all statutory and operational requirements.

- whether stated or not stated in this document, for the function of overpressure protection.

- Unless stated otherwise the Contractor supplies all labour as well as plant and materials, equipment, installation, and supervision required for the manufacturing, packaging, delivery to site, offloading, storage, assembly, and installation of all the equipment.

- It is the responsibility of the Contractor to verify all the information including dimensions, distances given by the Employer in order to ensure the supplied solution complies with all the standards and specifications.

- The Contractor provides all equipment and services and executes all works to fulfill all requirements specified in this works information.

- The detailed scope of supply for the works is defined by a combination of performance, functional and equipment specifications such that a complete functioning system is provided.

- All documents shall be supplied by Contractor as specified in VDSS, Appendix C of this Specification.

- The Contractor is to obtain his own copies of National and International standards.

3.8 Detailed Requirements

- **Functional Interfaces**

- No major change is foreseen with the implementation of this Engineering Change.
- The system interfaces with the existing interfaces but not limited to:
    - o DCS (ALSPA DCS Series 6 & SPPA-T3000)
    - BPS
    - TGC
    - FACOS

- BCM
- Station Office LAN
- Third party applications through OPCUA communication

3.8.1.2 Life Expectancy Life (Design Life)

The system shall conform to the design life of Medupi Power Station.

3.8.1.3 Security Requirements

- The installed equipment shall be appropriate protection mechanisms (e.g., password protected) to avoid unauthorised personnel tampering with the settings
.
- Caution should be taken by the Contractor to ensure that the PIS system complies to the cybersecurity standards and is well protected from malicious attacks.

- Each client user is requested to enter a username and a password, before being able to access the configuration and diagnostic software associated with a switch or a firewall.

3.8.1.4 Life Cycle Cost Management

As part of replacement, a life cycle management functional specification or Report shall describe and define the following points as a minimum:

- Life cycle costing considerations and total cost of ownership calculations.
- System and component replacement strategy.
- System and component maintenance strategy.
- Spares management strategy.

3.8.1.5 Requirements Related to Equipment Availability and Reliability

- Plant availability and reliability throughout project life must be maintained.

- The system shall be designed for an annual average availability of > 99.98% during the course of the life of the plant.

- The availability excludes hardware upgrades.

- The proposed equipment should have a failure rate of 1% or less over the duration of a calendar year.

- The plant shall be designed such that known failure mechanisms will not prevent the system from achieving its design life or meeting the availability.

- The system design shall incorporate design features to support high reliability of safety significant equipment and high system availability.

3.8.1.6 Standardization and interoperability

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- The standardization and interoperability of the system shall be maintained to ensure simpler analysis of the plant, as well as reduce lifecycle management costs.

3.8.1.7 Expandability Assessment

Not Applicable

3.9 Procurement, Installation & Quality

3.9.1 Quality

- This stage shall consist of the procurement, installation, on-site inspection and testing of all equipment forming part of the Works as well as other items that the *Employer* has specified such as free issued items.
- Eskom's requirements for quality assurance for the successful contractor is defined in the IS09001 standard. Therefore, the successful *Contractor* shall comply fully with the Eskom quality assurance requirements and any amendments which Eskom considers necessary or expedient during the life of the project.
- During the execution of the project the quality of workmanship and selection of materials shall be in accordance with the standards and codes of practice applicable to the project and with the Eskom requirements for quality assurance

- A detailed Quality Control Plan shall be provided by the successful supplier with clearly defined holding and witnessed points. These documents must be developed and accepted prior to installation.
- Quality inspections and tests shall be carried out by the *Contractor* after erection to prove the compliance of the installation with the Specification and the detailed engineering design freeze documentation.
- Erection and installation shall only be considered complete once the quality inspections and tests for the installation concerned have been approved by the *Employer*.
- The *Employer* reserves the right to appoint representatives, on behalf of the Employer, to inspect all parts during erection and to be present at any of the quality inspections and tests.
- The *Employer* is free to specify hold and witness points during the installation and testing stages of the project.
- The *Contractor* shall give twenty-one (21) days advance notice to the Employer of holds and witness points.
- The *Contractor* shall confirm hold and witness points at least nine (9) days prior to the test activity.
- The *Contractor* shall provide all test equipment for any inspections and tests.
- Damaged or defective structural steelwork and materials shall be set aside for the *Employer* to inspect and to decide whether such items may be rectified, repaired, or rejected.
- The *Employer* to have the right to order the removal from the Works of any defective or damaged material which have not been replaced or certified to his satisfaction, even if the material have been built into the Works.
- The *Contractor* to repair and replace all defective materials and rectify all defective workmanship at his own cost.
- All work done shall be approved and accepted by the *Employer.*
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3.10 Completion, Testing, Commissioning And Correction Of Defects

3.10.1 Work to be done by the Completion Date

- On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated.
- The Project Manager cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the Employer from using the works and others from doing their work.

3.10.2 Use of the works before Completion has been certified

The Employer has the right to make use of the works before completion, should a need arise.

3.10.3 Materials facilities and samples for tests and inspections

The Contractor provides all necessary testing facilities and samples.

3.10.4 FAT Requirements

- The Contractor shall prepare a detailed test procedure in preparation for FAT and submit same to the Engineer for approval.
- The Engineer determines if any further testing is required in addition to that specified, such as that of any new technologies being used.
- A Final FAT Report shall be prepared by the Contractor that includes the following as a minimum: o Test procedures used during FAT.
    - o Detailed Test results.
    - o Discrepancies identified during the tests.
    - o Resolution of the discrepancies.
    - o Retests conducted and results thereof.
    - o FAT certificate.

- These tests shall be conducted and/or witnessed by Employer representative from C&I Engineering, C&I Maintenance, TUV and Ops Support (Commissioning).

3.10.5 SIT Requirements

- Site Integration Testing (SIT) shall take place at the Medupi site after the equipment is delivered to site and has been installed, powered up and interfaced to the existing plant.
- The SIT shall be carried out before system commissioning commences to ensure: o Correct performance of the system.
    - o Safety of plant and personnel.
    - o Compliance with the Specification and the detailed engineering design freeze documentation.

- As a minimum, the SIT testing and inspection activities provided by the Contractor shall consist of site integration and site acceptance activities defined in IEC 62381.
- The Contractor shall prepare a detailed test procedure in preparation for SIT and submit same to the Employer for approval at least 28 days prior to the scheduled test date.
- As a minimum, the proposed SIT procedure shall identify the following: o Major test activities.
    - o Comprehensive list and description of the individual tests to be performed.
    - o How the tests are to be prepared and conducted.
    - o Test dates and durations.
    - o Checklists – how the test results will be documented.
    - o Acceptance Criteria.
    - o How the identified discrepancies will be processed.

- A Final SIT Report shall be prepared by the *Contractor* that includes the following as a minimum:

    - o Test procedures used during SIT.
    - o Detailed Test results.
    - o Discrepancies identified during the tests.
    - o Resolution of the discrepancies.
    - o Retests conducted and results thereof.
    - o SIT certificate.

- The Contractor shall submit the Final SIT Report to the Employer for approval.
- When all tests are successful and the Final SIT Report is approved by the Employer, the system is classified as 'ready for use'. The system is then deemed ready for cold commissioning.

3.10.6 Cold Commissioning

- Commissioning is defined as bringing into service all items of the Works and meeting the functional requirements and performance criteria of the Specification. This includes all necessary testing and verification of the stated performance criteria.
- This stage consists of all field equipment checks, loop checks, drive interface checks, and testing system functionality.
- The *Contractor* shall commission all interfaces to control equipment provided by the Engineer. The *Contractor* shall co-operate fully with the Engineer and the Other Project Contractors in the commissioning of the plant for which the Employer will supply the portion of equipment.
- Before the equipment is placed in service, the *Contractor* shall ensure that it is in a suitable and safe condition for use. This shall include all tests required to ensure safe and accurate measurements such as blow through of measurement lines, pressure testing of measurement lines, filling of reference pots, leak testing where applicable.
- Commissioning of the works is required before Completion of the works is certified by the project manager.
- The *Contractor* shall submit a commissioning procedure to the Employer one month before the planned date of commissioning. This procedure shall detail all of the steps and procedures to be taken in order to demonstrate the functionality of the system as well as checks which prove that the *Contracto*r has done everything required of him to provide the Works and fulfil the Purpose of the Works.
- Commissioning shall include all testing and verification of the stated performance criteria.
- The *Contractor* shall adhere to the requirements in 200-16714: Medupi Commissioning Procedure.

3.10.6.1.1 Instruments Test

- Calibrations of all instrumentation forms part of the Works and calibration data sheets shall be provided and signed by both parties and included as part of the documentation package for the Works.
- The *Contractor* shall submit the Cold Commissioning test results to the Engineer at the conclusion of cold commissioning and request the commencement of hot commissioning.
-

3.10.6.1.2 Function Checks

- The functional tests form part of the cold commissioning and include the checking of all measurement loops, interlocks, sequence controls, analogue controls and interfaces to systems provided by Other Project Contractors.
- The execution and documentation of loop checks shall be used upon standard IEC 62382

3.10.6.2 Hot Commissioning

- Hot commissioning is where the plant processes are placed into operation in conjunction with the control and instrumentation system and Other Project Contractors.
- The Contractor shall be responsible for the hot commissioning of all the equipment forming part of the Works and the interfaces to systems provided by Other Project Contractors to satisfy the requirements of the Specification.
- In cases where various components are connected to form an integrated system, the Contractor, at the time of commissioning, shall carry the responsibility for the correct functioning of the whole of the system.
- If a defect is identified in the equipment interfacing or external to the Contractor's scope the Contractor shall request the Engineer to rectify the defects.

3.10.7 Training and Technology Transfer

3.10.7.3 Training Requirements

- The *Contractor* shall provide training on all equipment included as part of the Works to the various categories of the Employer's technical staff for the duration of the Works.
- The objective of the training is to provide the Medupi Power Station staff with the necessary skills and knowledge to achieve all the plant performance targets with respect to safety, maintainability, availability, reliability and economic plant operation.
- The Contractor shall provide all formal training courses for the maintenance staff at Medupi Power Station.
- Facilities for training will be provided by the Employer at Medupi Power Station and will be a suitably sized air-conditioned room, to accommodate the trainees / trainer as well as trainee and trainer desks, a projector and flipchart or white board.
- Practical hands-on training for each individual trainee shall form the training.

3.10.8 Operational Maintenance after Completion

Maintenance of this system will be performed by C & I maintenance department.

4 Procurement

4.1 Sub-Contracting

No *Subcontractor* shall be appointed without the written acceptance of the *Project Manager*, refer to Clauses 11 and 26 of the ECC. The *Contractor* shall manage his Sub*contractor*s to ensure that the works are carried out in accordance with:

- The Accepted Programme
- The conditions of contract
- The Works Information

4.2 Plant and Materials

4.2.1 Spares and consumables

The *Contractor* is required to provide the spares are per the technical specification.

4.3 Commissioning and Testing

The *Contractor* shall be responsible for commissioning, acceptance or and performance testing of all the Works. The *Contractor* shall submit the following documentation for review and acceptance by the *Project Manager* prior to commissioning of the Works.

- Commissioning plan
- Commissioning procedure

Acceptance or and performance testing procedure. All commissioning and testing activities shall be conducted in line with the approved designs and contract. All commissioning and testing activities shall be witnessed by the Supervisor.

5 Construction

5.1 Temporary works, Site services & construction constraints

5.1.1 Restrictions to access on Site, roads, walkways and barricades

Temporary works shall be any work or infrastructure and or establishment which the *Contractor* requires in order to provide the *works*; which includes, inter alia his facilities, connection to existing water, sewer, electricity, etc. All such temporary works shall be adequately decommissioned, restoration to natural environment and the area made good on completion of the *works* to the acceptance of the *Project Manager.*

5.1.2 People restrictions on Site; hours of work, conduct and records

The *Contractor* is required to keep records of his people on Site, including those of his Sub*Contractor*s which the *Project Manager* or *Supervisor* has access to, at any time.

5.1.3 Working Areas

The extent and outline of the working area that may be used by the *Contractor* in carrying out the *works* shall be agreed with the *Supervisor*. Reference may be made to the Drawings for a general overview of the layout and extent of the works.

5.1.4 Facilities, Samples and Inspections

The *Contractor* shall arrange facilities where appropriate, to allow for the provision of samples, to the acceptance of the *Supervisor*. The *Supervisor* will carry out routine site inspections of finished work as well as of work in progress. The *Contractor* shall allow access to the works for such routine inspections.

5.1.5 Photography and Progress Photographs

In terms of the Contract, the *Contractor* is not required to provide the *Project Manager* or the *Supervisor* with photographs of work progress. The *Contractor* is not allowed to take photographs of the *works* or parts thereof without prior written authorisation by the *Project Manager.*

5.1.6 Liaison with Statutory Authorities

The *Contractor* shall be responsible for liaising with and ensuring compliance with the requirements of the appropriate statutory authorities in carrying out the *works*.

5.1.7 Site Establishment

5.1.7.1 *Contractor's* Camp/ Laydown

The *Contractor* must make his own arrangements for laydown and or site camp areas.

5.1.7.2 Power Supply to the Site

Employer will provide the source of power supply, the *Contractor* will then connect for their site offices as part of their establishment.

5.1.7.3 Water

Employer will provide potable water for domestic consumption on Site.

5.1.7.4 Other Facilities and Services

The *Contractor* shall provide all facilities and services required for completion of the *works* as detailed in the Works Information.

5.1.8 Existing Services

Within the locality of the *works*, there are existing services (telecommunication, sewage, water pipes and electrical cables) which the *Contractor* shall take extreme care to prevent any damages during the execution

of the *works.* The *Contractor* shall liaise with the *Supervisor* before work commences to identify existing services and shall be responsible to expose and protect all existing services where directed.

5.1.9 Operational maintenance after Completion

The *Contractor* is required to provide Operation and Maintenance Manuals for all of the *works*, for acceptance by the *Supervisor.*

6 Plant and Materials Standards and Workmanship

6.1 Materials, Workmanship and Products

6.1.1 Materials and Workmanship

New plant and materials are to be used for *works*. Plant and Materials to be permanently installed in to the works are not to be used for any temporary purposes on site.

PART 4: SITE INFORMATION

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	This cover page	1
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PART 4: SITE INFORMATION

Core clause 11.2(16) states

“Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in.”

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

General description

Medupi Power Station is situated in the west of Lephalale in the Limpopo province, South Africa. With the following address: Unnamed Road, Lephalale, 0555. And coordinates *23.7049º S, 27.5632º*.