



NEC3 Supply

Short Contract (SSC3)

A contract between Eskom Holdings SOC Ltd (Reg No. 2002/015527/30)

and

for **MANUFACTURING, SUPPLY AND DELIVERY OF
CONTROL PANELS FOR VANDERKLOOF POWER
STATION (DELIVERY TO ACACIA POWER STATION –
CAPE TOWN)**

Contents:	Compiled in accordance with CIDB Standard for Uniformity in Construction Procurement (May 2010) amendments	Page No.
Part C1	Agreements & Contract Data	
	C1.1 Form of Offer and Acceptance	[•]
	C1.2 Contract Data provided by the <i>Purchaser</i>	[•]
	C1.2 Contract Data provided by the <i>Supplier</i>	[•]
Part C2	Pricing Data	
	C2.1 Pricing assumptions	[•]
	C2.2 Price Schedule	[•]
Part C3	Scope of Work	
	C3.1 Goods Information	[•]
	Pro Forma Batch Order	

Documentation prepared by: Lubabalo Caba

C1 Agreements & Contract Data

C1.1 Form of Offer and Acceptance

Offer

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

MANUFACTURING, SUPPLY AND SUPPLY OF CONTROL PANELS FOR VANDERKLOOF POWER STATION (DELIVERY TO ACACIA POWER STATION – CAPE TOWN)

The tenderer, identified in the signature block below, has

<i>either</i>	examined the documents listed in the Tender Data and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.
<i>or</i>	examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

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 Supplier 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.

The offered total of the Prices exclusive of VAT is	R
Value Added Tax @ 15% is	R
The offered total of the Prices inclusive of VAT is	R
(in words)	

This Offer may be accepted by the Purchaser by signing the form of Acceptance overleaf 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 Supplier 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

Acceptance

By signing this part of this Form of Offer and Acceptance, the Purchaser identified below accepts the tenderer's Offer. In consideration thereof, the Purchaser shall pay the Supplier 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 Purchaser 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 1 Agreements and Contract Data, (which includes this Form of Offer and Acceptance)

Part 2 Pricing Data

Part 3 Scope of Work: Goods 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 Tender Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Purchaser 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, which must be signed by the duly authorised representative(s) for both parties.

The tenderer shall within one week of receiving a completed copy of this Agreement, including the Schedule of Deviations (if any), contact the Purchaser'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 copy of this document, including the Schedule of Deviations (if any) together with all the terms of the contract as listed above.

Unless the tenderer (now *Supplier*) within five working days of the date of such receipt notifies the Purchaser 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)

Aldrin Cloete

Capacity

Acting Programme Manager

**for the
Purchaser**

Name &
signature of
witness

Date

Note: If a tenderer wishes to submit alternative tender offers, further copies of this document may be used for that purpose, duly endorsed, 'Alternative Tender No. _____'.

Schedule of Deviations

Note:

1. To be completed by the Purchaser prior to award of contract. 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 Purchaser 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 Purchaser 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 Purchaser 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 Purchaser**

Signature

Name

Capacity

On behalf
of*(Insert name and address of organisation)*Name &
signature
of witness

Date

Aldrin Cloete

Acting Programme Manager

Eskom Peaking Generation

C1.2 Contract Data

Data provided by the *Purchaser*

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

1. Please read the relevant clauses in the NEC3 Supply Short Contract (April 2013) (SSC3)¹ before you enter data. The number of the principal clause is shown for most statements however other clauses may also use the same data.
2. Where the following symbol is used “**[•]**” - data is required to be inserted.]

Completion of the data in full is essential to create a complete contract.

Clause	Statement	Data
General		
10.1	The <i>Purchaser</i> is (Name):	Eskom Holdings SOC Limited (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
	Tel No.	(011) 800-4174
	Fax No.	(086) 664-9145
	E-mail address	Cabal@eskom.co.za
11.2(4)	The <i>delivery date</i> is	30 May 2024
11.2(5)	The Goods Information is in	the document called ‘Goods Information’ in Part 3 of this contract.
11.2(8)	The <i>goods</i> are	Manufacturing and supply of Control Panels
12.2	The <i>law of the contract</i> is	Law of the Republic of South Africa
13.2	The <i>period for reply</i> is	1 week
15.1	The <i>premises</i> are	Acacia Power Station
23.1	The <i>Purchaser</i> requires the <i>Supplier</i> to Provide the Goods when instructed by Batch Order.	No
30.1	The <i>starting date</i> is.	25 January 2024
41.1	The <i>defects date</i> is	52 weeks after Delivery.
42.2	The period for the correction of Defects after Delivery is	1 week
50.1	The <i>assessment day</i> is the	Upon Delivery

¹ Available from Engineering Contract Strategies on www.ecs.co.za Tel 011 803 3008, Fax 086 539 1902

50.5	The <i>delay damages</i> are [If the <i>goods</i> are instructed by Batch Order enter a <i>delay damages</i> amount appropriate to the quantity or use of the <i>goods</i> in the Batch]	5 % of the Total Contract Value per week up to a maximum of 25 % of the Total Contract Value
51.2	The interest rate on late payment is	0% per complete week of delay.
86.1	The <i>Supplier's</i> liability to the <i>Purchaser</i> for indirect or consequential loss, including loss of profit, revenue and goodwill is limited to	Zero
86.2	The <i>Supplier</i> is not liable to the <i>Purchaser</i> for loss of or damage to the <i>Purchaser's</i> property in excess of	[•] for any one event.
93.1	The <i>Adjudicator</i> 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).
93.2(2)	The <i>Adjudicator nominating body</i> is:	the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the Institution of Civil Engineers (UK) or its successor body (See www.ice-sa.org.za).
93.4	The <i>tribunal</i> is: If the <i>tribunal</i> is arbitration, the arbitration procedure is	arbitration. the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.
11.1	The <i>conditions of contract</i> are the NEC3 Supply Short Contract (April 2013)^{2 3} and the following additional conditions. [Only enter details here if additional conditions are required, otherwise state 'none']	

² Can be obtained from Engineering Contract Strategies on www.ecs.co.za, Tel 011 803 3008, Fax 086 539 1902

³ If the December 2009 edition is being used, replace April 2013 with December 2009

Z1 Cession delegation and assignment

- Z1.1 The *Supplier* does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the *Purchaser*.
- Z1.2 Notwithstanding the above, the *Purchaser* may on written notice to the *Supplier* 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 and the Electricity Distribution Industry.

Z2 Change of Broad Based Black Economic Empowerment (B-BBEE) status

- Z2.1 Where a change in the *Supplier's* legal status, ownership or any other change to his business composition or business dealings results in a change to the *Supplier's* B-BBEE status, the *Supplier* notifies the *Purchaser* within seven days of the change.
- Z2.2 The *Supplier* is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the *Purchaser* within thirty days of the notification or as otherwise instructed by the *Purchaser*.
- Z2.3 Where, as a result, the *Supplier's* B-BBEE status has decreased since the Contract Date the *Purchaser* may either re-negotiate this contract or alternatively, terminate the *Supplier's* obligation to Provide the Goods.
- Z2.4 Failure by the *Supplier* to notify the *Purchaser* of a change in its B-BBEE status may constitute a reason for termination. If the *Purchaser* terminates in terms of this clause, the procedures on termination are the same as for Reason 3 identified in clause 90.3.

Z3 Waiver and estoppel: Add to clause 12.3:

- Z3.1 Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, 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.

Z4 Provision of a Tax Invoice and interest. Add to clause 51

- Z4.1 The *Supplier* provides the *Purchaser* with a tax invoice in accordance with the *Purchaser's* procedures stated in the Goods Information, showing the correctly assessed amount due.
- Z4.2 If the *Supplier* does not provide a tax invoice by the time required in this contract for his assessment of each amount due, the time by when the *Purchaser* 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 *Purchaser* in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.
- Z4.3 The *Supplier* (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 *Purchaser's* VAT number 4740101508 on each invoice he submits for payment.

Z5 Purchaser's limitation of liability

Z5.1 The *Purchaser's* liability to the *Supplier* for the *Supplier's* indirect or consequential loss is limited to R0.00 (zero Rand)

Z5.2 The *Supplier's* entitlement under the indemnity in 83.1 is provided for in 60.1(8) and the *Purchaser's* liability under the indemnity is limited.

Z6 Termination: Add to clause 90.2 before (Reason 1)

Z6.1 or had a judicial management order granted against it.

Z7 Addition to clause 50.5

Z7.1 If the amount due for the *Supplier's* payment of *delay damages* reaches the limits stated in this Contract Data (if any), the *Purchaser* may terminate the *Supplier's* obligation to Provide the Goods using the same procedures and payment on termination as those applied for Reason 3. Identified in clause 90.3.

Z8 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 <i>Supplier</i> 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 <i>Supplier</i> , or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractors 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.

Z8.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.

Z8.2 The *Purchaser* may terminate the *Supplier's* obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Supplier* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the *Purchaser* 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 *Purchaser* can terminate the *Supplier's* obligation to

Provide the Services for this reason.

Z8.3 If the *Purchaser* terminates the *Supplier'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.

Z8.4 A Committing Party co-operates fully with any investigation pursuant to alleged Prohibited Action. Where the *Purchaser* does not have a contractual bond with the Committing Party, the *Supplier* ensures that the Committing Party co-operates fully with an investigation.

Z9 Insurance

Replace condition of contract 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 *Supplier* provides the insurances in this Insurance Table A from the *starting date* until Delivery and against any risks he carries under this contract between Delivery and the *defects date*.

INSURANCE TABLE A

Insurance against	Minimum amount of cover or minimum limit of indemnity
Loss of or damage to the <i>goods</i> , plant and materials	The replacement cost where not covered by the <i>Purchaser's</i> insurance. The <i>Purchaser's</i> policy deductible as at contract date where covered by the <i>Purchaser's</i> insurance.
Liability for loss of or damage to property (except the <i>goods</i> , plant and materials and equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Supplier</i>) caused by activity in connection with this contract	<u>Loss of or damage to property</u> <u><i>Purchaser's</i> property</u> The replacement cost where not covered by the <i>Purchaser's</i> insurance. The <i>Purchaser's</i> policy deductible as at contract date, where covered by the

	<i>Purchaser's insurance.</i> <u>Other property</u> The replacement cost Death of or bodily injury The amount required by the applicable law.
Liability for death of or bodily injury to employees of the <i>Supplier</i> arising out of and in the course of their employment in connection with this contract	The amount required by the applicable law

84.2 The Purchaser provides the insurances in this Insurance Table B

INSURANCE TABLE B

Insurance against or name of policy	Minimum amount of cover or minimum limit 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

Z10 Nuclear Liability

- Z10.1 The *Purchaser* 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.
- Z10.2 The *Purchaser* is solely responsible for and indemnifies the *Supplier* or any other person against any and all liabilities which the *Supplier* 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 *Supplier* or any other person or the presence of the *Supplier* or that person or any property of the *Supplier* or such person at or in the KNPS or on the KNPS site, without the permission of the *Purchaser* or of a person acting on behalf of the *Purchaser*.
- Z10.3 Subject to clause Z10.4 below, the *Purchaser* 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 *Supplier* or any other person, or the presence of the *Supplier* or that person or any property of the *Supplier* or such person at or in the KNPS or on the KNPS site, without the permission of the *Purchaser* or of a person acting on behalf of the *Purchaser*.
- Z10.4 The *Purchaser* 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.
- Z10.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

Z11 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 *Purchaser'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.
- Z11.1 The *Purchaser* ensures that the Ambient Air in the area where the *Supplier* 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.
- Z11.2 Upon written request by the *Supplier*, the *Purchaser* 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 *Supplier* may perform Parallel Measurements and related control measures at the *Supplier'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 Z11.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.
- Z11.3 The *Purchaser* manages asbestos and ACM according to the Standard.
- Z11.4 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.
- Z11.5 The *Supplier'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.
- Z11.6 The *Supplier* 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.

- Z11.7 Any removal and disposal of asbestos, asbestos containing materials and waste, is done by a registered asbestos contractor, instructed by the *Purchaser* at the *Purchaser's* expense, and conducted in line with South African legislation.

Data provided by the *Supplier* (the *Supplier's Offer*)

The tendering Supplier is advised to read both the NEC3 Supply Short Contract (April 2013) and the relevant parts of its Guidance Notes (SSC3-GN)⁴ 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 page 28 of the SSC3 Guidance Notes and Flow Charts.

Completion of the data in full is essential to create a complete contract.

10.1	The <i>Supplier</i> is (Name):	[•]
	Address	[•]
	Tel No.	[•]
	Fax No.	[•]
	E-mail address	[•]
11.2(7)	The Price Schedule is in	the document called 'Price Schedule' in Part 2 of this contract.
11.2(7)	The offered total of the Prices	See C1.1 Form of Offer and Acceptance
63.2	The percentage for overheads and profit added to the Defined Cost is	[•]%

⁴ Available from Engineering Contract Strategies on www.ecs.co.za Tel 011 803 3008, Fax 086 539 1902.

C2 Pricing Data

C2.1 Pricing assumptions

Entries in the first four columns of this Price Schedule are made either by the *Purchaser* or the tenderer. If the *Supplier* is to be paid an amount for the item which is not adjusted if the quantity of goods in the item changes, the tenderer enters the amount in the Price column only, the Unit, Quantity and Rate columns being left blank.

If the *Supplier* is to be paid an amount for the item of goods which is the rate for the goods multiplied by the quantity supplied, the tenderer enters a rate for each item and multiplies it by the Quantity to produce the Price, to be entered in the final column.

The rates and Prices entered for each item includes for all work and other things necessary to supply the item.

C2.2 Price Schedule

The rates and Prices entered for each item includes for all work and other things necessary to supply the item.

Item no.	Description	Unit	Quantity	Rate	Price
	Manufacturing , Assembly and FAT	EA			
	Delivery	EA			

Total of the Prices

C3: Scope of Work

PART 3: SCOPE OF WORK

Document reference	Title	No of pages
	This cover page	1
C3.1	<i>Purchaser's Goods Information</i>	34
	Total number of pages	35

C3.1: *PURCHASER'S* GOODS INFORMATION

Contents

Part 3: Scope of Work	1
<u>C3.1: Purchaser's Goods Information</u>	2
<u>1 Overview and purpose of the goods and services</u>	5
<u>1.1 Executive Overview</u>	5
<u>1.1.1 High level scope of work</u>	5
<u>1.2 Purchaser's objectives and purpose of the works</u>	5
<u>1.2.1 Purchaser's objective</u>	5
<u>1.2.2 Purpose of the works</u>	6
<u>1.3 Interpretation and terminology</u>	6
<u>2 Specification and description of the goods</u>	7
<u>2.1 Purchaser's design</u>	7
<u>2.2 Procedure for submission and acceptance of Supplier's design</u>	7
<u>2.2.1 Engineering Change Management and Procurement process</u>	7
<u>2.2.2 Design Review Procedure</u>	7
<u>2.2.3 Process for submission of documents</u>	7
<u>2.2.4 Time Required for Acceptance of Designs</u>	8
<u>2.2.5 General documentation requirements for acceptance of Supplier's design</u>	8
<u>2.2.6 Basic design documentation requirements for acceptance of the Supplier's design</u>	9
<u>2.2.7 Detail design documentation requirements for acceptance of the Supplier's design</u>	9
<u>2.3 Other requirements of the Supplier's design</u>	9
<u>2.3.1 Design of Equipment</u>	9
<u>2.3.2 Equipment required to be included in the works</u>	9
<u>2.4 Use of Supplier's design</u>	10
<u>2.5 Manufacture & fabrication</u>	11
<u>2.6 Factory acceptance testing (FAT)</u>	11
<u>2.6.1 The Supplier's preparation for FAT</u>	11
<u>2.6.2 Factory Acceptance Tests (FAT)</u>	11
<u>2.7 Other tests and inspections and commissioning in place of use</u>	12
<u>2.8 Operating manuals and maintenance schedules</u>	12
<u>2.8.1 General</u>	12
<u>2.8.2 Drawings</u>	12
<u>2.8.3 Manuals</u>	12
<u>2.8.4 Signed-off documentation</u>	13

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

3	<u>Supply Requirements</u>	13
	<u>3.1 Power Supply Distribution</u>	13
	<u>3.2 Main Unit Controller and Remote I/O's panels</u>	13
	<u>3.3 Unit Temperature and Speed Monitoring panels</u>	14
	<u>3.4 Unit Turbine Governor Control panels</u>	14
	<u>3.5 Station Controller and Remote I/O</u>	15
	<u>3.6 National Control and Standby Control</u>	15
	<u>3.7 Panel Size and Quantity:</u>	15
	<u>3.8 Earthing</u>	16
	<u>3.9 Wiring and Termination</u>	16
	<u>3.10 Labelling and Core Wiring Tag</u>	17
	<u>3.11 Panel Labelling</u>	17
	<u>3.17 Codification</u>	18
4	<u>Specification of the services to be provided</u>	18
5	<u>Constraints on how the Supplier Provides the Goods</u>	19
	<u>5.1 Programming constraints</u>	19
	<u>5.2 Work to be done by the Delivery Date</u>	19
	<u>5.2.1 Access given by the Purchaser for correction of Defects</u>	20
	<u>5.3 Marking the goods</u>	20
	<u>5.4 Constraints at the delivery place and place of use</u>	20
	<u>5.5 Cooperating with Others</u>	20
	<u>5.6 Services & other things to be provided by the Purchaser or Supplier</u>	20
	<u>5.7 Management meetings</u>	20
	<u>5.8 Documentation control</u>	20
	<u>5.9 Health and safety risk management</u>	20
	<u>5.10 Environmental constraints and management</u>	22
	<u>5.11 Quality</u>	22
	<u>5.11.1 Product Support</u>	23
	<u>5.11.2 Defect's correction</u>	23
	<u>5.11.3 Plant & Materials provided "free issue" by the Purchaser</u>	23
	<u>5.11.4 Supplier's procurement of Plant and Materials</u>	24
	<u>5.11.5 Spares and consumables</u>	24
	<u>5.12 Invoicing and payment</u>	24
	<u>5.13 Insurance provided by the Purchaser</u>	25
	<u>5.14 Contract change management</u>	25
	<u>5.15 Provision of bonds and guarantees</u>	25
	<u>5.16 Records of Defined Cost, payments & assessments of compensation events to be kept by the Supplier</u>	26
6	<u>Procurement</u>	26
	<u>6.1 Subcontracting</u>	26

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

6.1.1	Preferred sub-Contractors	26
6.1.2	Limitations on subcontracting	26
6.1.3	Spares and consumables	26
6.1.4	Other requirements related to procurement	26
6.1.5	Cataloguing requirements by the <i>Supplier</i>	26
7	List of drawings	27
7.1	Drawings issued by the <i>Purchaser</i>	27
APPENDIX A: SCHEDULE A&B		27
APPENDIX B: SPARES		36

Overview and purpose of the *goods and services*

Executive Overview

The *works* makes provision for development of assembly drawings, procurement of components and consumables, manufacture, assembly, factory acceptance test, supply, delivery and offloading of complete control panels for two units and station common plant.

This document contains the Goods Information for the upgrade of the control systems at Vanderkloof Power Station for all units and station common plant. The replacement is a standard solution, fit for purpose, which forms part of the Peaking Strategy, to standardise the technology across the hydro power plant and pump storage

Vanderkloof Hydroelectric Power Station, situated in the Northern Cape Province near Petrusville, first entered commercial operation in 1977. The power station comprises of two units generating 120 MW each and is an integral component of the Orange River Scheme. The station's electricity feeds into the Eskom National Grid to supply power for peak and emergency demand periods, as well as base load when excess water might pose a flood risk.

The control and instrumentation systems at the power station have exceeded their useful life, thereby posing an operational risk to the plant. As part of the power station Life of Plant Plans (LOPP), based on the remaining power plant commercial operation life and the engineering strategy, the Control and Instrumentation systems on the plant need to be replaced. Replacements are necessary to maintain the current level of plant availability and to improve the reliability, as well as the maintainability of the power station.

This document details the Goods Information of the electrical control panels housing of the control equipment and components, collectively constituting the upgraded systems.

High level scope of *work*

- a) development of assembly drawing,
- b) procurement of components and consumables,
- c) manufacture,
- d) assembly,
- e) factory acceptance testing,
- f) supply,
- g) delivery,

off-loading, of complete control panels for two units and station common plant.

Purchaser's objectives and purpose of the works

Purchaser's objective

The *Purchaser's* objective is to accomplish the implementation of the Control and Electrical refurbishment programme within the stipulated power station's planned outage (shutdown) periods. This programme is an execution of the *Purchaser's* Life of Plant Plans (LOPP) needed to maintain the highest levels of reliability and performance for the remaining commercial life of the power station.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Purpose of the *works*

The purposes of the *works* are as follows:

- a) Address the issue of obsolescence for the control and instrumentation at Vanderkloof Power Station with a system that is able to operate reliably and safely for at least 15 years after commissioning.
- b) Install new technology, which meets the requirements of the *Purchaser*.
- c) Improve systems availability, reliability, and maintainability.
Improve ease of operation, maintenance, and fault-finding.

Interpretation and terminology

The following abbreviations are used in this Goods Information:

Abbreviation	Meaning given to the abbreviation
A	Ampere
AC	Alternative Current
AFC	Approved for construction
D	Depth
DC	Direct Current
FAT	Factory Acceptance Test
H	Height
HMI	Human Machine Interface
I/O	Input/Output
ISO	International Standard Organisation
KKS	Kraftwerk Kenzeichnungs System
LED	Light-emitting Diode
LOPP	Life of Plant Plan
MCB	Miniature Circuit Breaker
mm	Millimetre
MUC	Main Unit Controller
N/A	Not applicable
OBL	Outside battery limits
OEM	Original Equipment Manufacture
PLC	Programmable Logic Controller
QCP	Quality Control Plan
QM	Quality Management
V	Voltage
W	Width
*	Unit 1 or Unit 2

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Specification and description of the goods**Purchaser's design**

The *Purchaser* provides the following:

- a) Panel arrangement concept in Microsoft Visio (.vdz format) or Acrobat Reader (.pdf format). The *Supplier* uses the conceptual layout to create manufacturing drawings taking into account correct sizing, components cut-outs and layouts.
- b) Where panels are shown as a joined of two or three panels of not the same system the *Supplier* have to submit to the *Purchaser* separate drawings refer to Appendix C.
- c) Electrical circuit diagram (including loop drawings), which the *Supplier* uses when wiring the internal of the control panels.
- d) Equipment and component list (type).

Procedure for submission and acceptance of Supplier's design**Engineering Change Management and Procurement process**

The *Supplier* takes notes of the *Purchaser's* process of authorising the design which is the Engineering Change Procedure (240-53114026). Engineering changes includes any proposed change originating from engineering, Suppliers, project management and construction management.

The Engineering Change Procedure applies to the *Purchaser's* personnel or *Supplier* performing engineering or change related work where the quality of the engineering work performed is the direct responsibility for the *Purchaser*. The process consists of:

- a) Submission of Detail Design by *Supplier*
 - b) *Purchaser's* Project team reviews
 - c) Updates Detail Design review by *Supplier*
 - d) Detail Design Scope Freeze review
 - e) Procurement of material
 - f) Manufacturing of the control panels
 - g) Factory acceptance test
- Delivery of control panels to Eskom

Design Review Procedure

The *Supplier* is made aware of the Design Review Procedure (240-53113685). The process of the review consists of:

- a) Design "Freeze" Review

Process for submission of documents

The *Supplier* submits all documentation according to the accepted engineering management plan. The process for the submission of documentation is described below:

- a) The *Supplier* issues the *Purchaser* with a Design Review Sheet (DRS) to complete with every submission. Every revision shows by number, date, and subject in the revision block on the drawing.
- b) The *Supplier* submits the documents/drawings to the *Supply Manager* with the appropriately reference Design Review Template.
- c) The *Purchaser's* Document Controller registers the documents
- d) The *Purchaser's* Document Controller supplies the documents/drawings to all relevant parties within the *Purchaser's* project team.
- e) The *Purchaser's* project team reviews the documents/drawings and submits all comments or inputs to the *Supply Manager* and the *Supply Manager* submits to the *Supplier* for consideration.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

- f) The *Supplier* revises the design, documents and/or drawings to address the *Purchaser's* comments and resubmits to the *Supply Manager*.
- g) Once all the *Purchaser's* comments have been addressed and no major deficiencies are found, the *Supplier* arranges a Design Review session.
- h) If no fundamental errors are found in the design during the Design Review session, the *Supplier* compiles the Design Review minutes or report and submits it to the *Supply Manager*.
- i) The *Purchaser's* Document Controller registers the report.
- j) The *Purchaser's* project team reviews the *Supplier's* report/minutes. If the report/minutes are not acceptable, the *Supplier* revises the report/minutes and resubmits to the *Supply Manager*.
- k) The *Supply Manager* accepts the *Supplier's* design once the report/minutes are accepted by the *Purchaser's* project team.
- l) After the acceptance of the full Basic Design, the *Supplier* proceeds with the Detail Design.
- m) After Detail Design has been accepted by the *Purchaser*, the *Supplier* proceeds with manufacturing of the control panels based on the accepted Detail Design.
- n) The *Supplier* submits all technical documentation and drawings for acceptance by the *Purchaser* prior to manufacture.

Time Required for Acceptance of Designs

Not later than one month after receipt, the *Supply Manager* returns one copy of the drawing marked "Accepted", "Accepted as Noted" or "Not Accepted", as may be appropriate. The notations "Accepted" and "Accepted as Noted" authorize the *Supplier* to proceed with the manufacture of the Plant covered by such drawings subject to the corrections, if any, indicated thereon. Where prints or drawings have been "Not Accepted" or "Accepted as Noted" the *Supplier* makes the necessary revisions on the drawings and submit further copies for acceptance in the same procedure as for the original submission of drawings.

2.2.5 General documentation requirements for acceptance of *Supplier's* design

- a) All documentation complies with the latest Eskom's Classification and Designation of Technical Documentation Standard, 240-54179170; Eskom's Documentation Management Standard, 32-644 rev1, NRS 002.
- b) The documentation supplied is in South African English and SI units are used.
- c) The *Supplier* provides documentation in the electronic media using Microsoft Office, unless otherwise stated.
- d) The *Supplier* implements a comprehensive document management system of the control of all documents, revision status "as-designed", "as-manufactured", "as-commissioned" and "as-built".
- e) The *Purchaser* does not accept scanned electronic copies of documentation or drawings.
- f) The *Supplier* submits electronic copies of PDF drawings upon first issue and each time drawing updates are required.
- g) The final as-built drawing in an electronic format is submitted in MicroStation (DGN) or format that is compatible with MicroStation.
- h) Multilayer drawings are not acceptable.
- i) All documents and drawing submissions are prepared and signed-off by suitably qualified personnel.
- j) The *Purchaser* allocates numbers to the documentation and drawings, which the *Supplier* indicates on the documentation and drawings.
- k) The *Supplier* uses the pre-approved templates provided by the *Purchaser* for documentation and drawings. The drawings make provision for the Eskom border.
- l) All documentation required at the various acceptance stages are submitted in a hard copy and a software copy format.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

2.2.6 Basic design documentation requirements for acceptance of the *Supplier's* design

After the Contract Date, the *Supplier* performs the Basic Design in accordance with *Purchaser's* requirements presented by Typical Schematic Diagrams and Schedules. The designs are agreed with the *Purchaser* to achieve Design Freeze status.

The *Supplier* submits as a minimum the following data in neat files for acceptance by the *Supply Manager* before the Basic Design Freeze status can be declared:

- a) Completed Relevant Technical Schedules B
- b) Deviation Schedule
- c) General Arrangement Drawings of the control panels and components circuit layout (this includes all the wire numbers, termination number, terminal strip number)
- d) Components Schedule or Bill of Materials
- e) Technical Data sheets of components
- f) Technical Manuals
- g) Test Certificates

2.2.7 Detail design documentation requirements for acceptance of the *Supplier's* design

- a) The final accepted assembly drawing of the complete control panels.
- b) All detail design drawings have the pre-approved title blocks and borders as provided by the *Purchaser*. The *Purchaser* provides samples of the pre-approved title blocks to be used by the *Supplier*. The *Supplier* completes the title block information as per drawing standard listed.
- c) FAT procedures to be used.

Other requirements of the *Supplier's* design**Design of Equipment**

The *Supplier* designs the equipment in accordance with the requirements of the *Purchaser's* stated in this document. This is limited to the:

- a) Development of the assembly drawings.
- b) Procurement of component and consumable.
- c) Manufacturing of standard off shelf control panels.
- d) Housing of components together to complete a panel.

Equipment required to be included in the *works*

The *Supplier* is to make use of the following minimum standard equipment in order to complete the *works*:

- a) Plier Crimping Tool for Bootlace Ferrule
 - 1. Knipex Plier Crimping Tool for Bootlace Ferrule – 97 53 14, 0.08-10mm² 6 Di Crimper or
 - 2. Phoenix Contact Plier Crimping Tool – 1212046, 0.14mm² to 6 mm² or
 - 3. Hellermann Tyton YAC9 Bootlace Ferrule Crimper, 0.08-6mm² or Equivalent
- b) Wire Stripper
 - 4. Hellermann Tyton Wire Stripper 1-3.2mm² or
 - 5. RS PRO 170mm Wire Stripper 0.2mm-6mm or Equivalent
- c) Pre-insulated Lug Crimping Tool
 - 6. Hellermann Tyton YYT1 Pre-insulated Terminal Crimper
- d) Torque Terminal Screwdriver
 - 7. Phoenix Contact Torque Screwdriver, TSD-M 1,2Nm – 1212224 (0.3 → 1.2Nm) or
 - 8. Wera ¼ inch Hex Pre-Settable Torque Screwdriver, 0.3 → 1.2Nm or Equivalent

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

e) Multimeter

9. Fluke 789 Process Meter, 1A Multi-Function Calibrator or Equivalent

The *Supplier* submits all technical documentation for the *Supply Manager's* acceptance, prior to manufacturing of the control panels such as:

- a) Method Statements
- b) Quality Control Plans and Check Sheets
- c) Components Schedule or Bill of Materials
- d) Assembly drawings
- e) Hard copies of the following:
 1. List of material to be used for the *works*
 2. Dimensions
 3. Technical Data sheets
 4. Technical manual
 5. Recommended spares list
 6. Test certificates

Use of *Supplier's* design

- a) The *Purchaser* may use and copy the *Supplier's* design for any purpose connected with construction, use, alteration, or demolition of the *works* at the *Purchaser's* installation.
- b) All designs, drawings, specifications, instructions, manuals and other documents created, produced by or on behalf of the *Supplier* for the purposes of Providing the Works (collectively, the "*Supplier's* Copyright Documents") and copyright therein and all intellectual property rights relating thereto, are, will be, and will remain the property of the *Supplier*.
- c) The *Supplier* hereby grants to the *Purchaser*, with effect from the Contract Date or in the case of documents or other matter not yet in existence, with the effect from the creation thereof (and notwithstanding the Completion or abandonment of the *works* or termination of this Agreement) an irrevocable, royalty-free, non-exclusive and perpetual licence to use those of the *Supplier's* documents and other matter supplied to the *Purchaser* under this contract, for any purpose whatsoever connected with the *works*, including for the purpose of maintenance, operation, construction, retrofit, refurbishment, upgrade, repair or demolition of the *works* or any parts thereof.
- d) The *Purchaser* uses the *Supplier's* Copyright Documents and all intellectual property rights relating thereto for the sole purpose of all its needs at Vanderkloof Power Station, which includes any *Purchaser* processes and procedures pertaining to use, maintenance, operation, construction, retrofit, refurbishment, upgrade, repair or demolition of the *works*.
- e) The *Purchaser* may copy and submit, without restriction, all documentation to others employed or contracted by the *Purchaser* who has duly signed a confidentiality agreement with the *Purchaser*.
The *Supplier* may not use any Copyright Documents (and the copyright therein and all intellectual property rights relating thereto), which are owned by the *Purchaser* and/or Others and provided to the *Supplier*, for any other purpose than to Provide the Works. The *Supplier* may not copy and therefore not retain copies of any such Copyright Documents. At Completion of the whole of the *works*, or earlier termination, the *Supplier* returns to the *Purchaser* all such documentation provided to him by the *Purchaser* and/or Others.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Manufacture & fabrication

N/A

Factory acceptance testing (FAT)**2.6.1 The *Supplier's* preparation for FAT**

- a) The *Supplier* prepares and submits a QCP and the test procedures with check sheets. Quality and testing acceptance criteria is included in these procedures.
- b) The *Supplier* doesn't power up any part of the control panels in the absence of the *Purchaser's delegates*. The *Supplier* bench tests the power supply modules before installation and provides test procedure and results.
- c) During these tests, the *Supplier* verifies all hardware designs against the design specification and requirements.
- d) All tests are carried out as per accepted testing procedures and programme.
- e) The *Supplier* documents all tests as part of the quality assurance and control procedures. These documents are submitted to the *Supply Manager* prior to the commencement of FAT.
- f) The *Supplier* supplies data sheets of all components supplied for the *Works*.

2.6.2 Factory Acceptance Tests (FAT)

The *Supplier* demonstrate the functionality of each integrated panel at the *Supplier's* premises for acceptance by the *Supply Manager*.

- a) The *Supplier* provides all necessary equipment and labour to carry out the tests.
- b) The *Purchaser* provides all equipment and configuration for testing of the PLC I/O modules.
- c) All tests are carried out as per accepted testing procedures and programme.
- d) All tests are documented as part of quality assurance and control procedure.
- e) Any Defects encountered during testing are documented and corrected.
- f) The *Supplier* submits copies of all tests, indicating the results of all tests performed, for acceptance by the *Supply Manager*.
- g) The *Supplier* provides test certificates for all the tests performed.
- h) The *Supplier* with *Purchaser* witnessing performs the following test:
 - 1) Hardware visual inspections
 - 2) Verification (blue lining of drawings) of all hardware design against the design specification
 - 3) Verification (blue lining of drawings and Panel Erection Check-sheet) of all wiring and labelling including the conformance to the standards and requirements.
 - 4) Power supplies checks (using *Purchaser's* DC supply check procedure)

The *Purchaser* prepares documentation for simulation of PLC I/O modules and perform verification with the *Supplier* witnessing.

Other tests and inspections and commissioning in place of use

N/A

Operating manuals and maintenance schedules

2.8.1 General

- a) The *Supplier* submits, to the *Purchaser*, final As-built documentation of the *works* within 60 days of completion of the *works*.
- b) The *Supplier* submits three full sized hardcopies plus two electronic copies of the As-built documentation. The electronic copies are submitted on individual USB flash drives.
- c) The *Supplier* provides documentation in the electronic media using Microsoft Office or “searchable” PDF format.
- d) The *Purchaser* allocates numbers to the documentation and drawings, which the *Supplier* indicates on the documentation and drawings.
- e) The documentation is submitted in loose leaf binders to ISO format and normally A4 size. The use of oversize pages is kept to a minimum and does not exceed page height unfolded. Fixings are “D” ring and are of the snap close type. Post binders or other fixings are not acceptable. Binders do not exceed 80mm in overall thickness. The document identity appears on both the front cover and on the spine.

2.8.2 Drawings

- a) All drawing complies with the Eskom Engineering Drawing Standard 240-86973501 – Common Requirements.
- b) Graphical symbols are used in accordance with the NRS 002 standard.
- c) The *Supplier* produces the following type of drawings:
 - i) Cover sheet
 - ii) Index sheet
 - iii) List of symbols
 - iv) List of components with values, tolerances, ratings, type numbers, purchasing specification numbers, manufacturer, and circuit reference numbers
 - v) Assembly drawing include the followings:
 - 1) Control panel general specification diagram (front and rear).
 - 2) Control panel arrangement diagram (front, rear, and side sections).
 - 3) Control panel hardware arrangement diagram (front, rear, and side sections).
 - 4) Gland plates (dimensions)
- d) All drawings are submitted to the *Supply Manager* for his acceptance.
- e) The *Supplier* produces as build drawings within 4 weeks of each site acceptance tests and submits to the *Supply Manager* for his acceptance.

2.8.3 Manuals

- a) The *Supplier* provides technical manual for each equipment or component used in the control panels, which is supplied by the *Supplier*.
- b) The *Supplier* incorporates the operating description, all necessary technical data, design data, and drawings into the manuals.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

2.8.4 Signed-off documentation

- a) Copies of all tests, indicating the results of all tests performed, are submitted to the *Supply Manager*.
- b) The *Supplier* supplies the *Purchaser* with Instruction, Technical or Operating and Maintenance Manuals that includes:
 - i) Signed-off test certificates
 - ii) Signed-off Quality Control Plan and Check sheets
 - iii) Standard brochures, catalogues, descriptions
 - iv) List of recommended spares
- c) The final issues of all manuals and drawings are submitted (4) weeks after Completion for acceptance by the *Supply Manager*. All documentation duplicates reflect the original's quality.

Supply Requirements**3.1 Power Supply Distribution**

- a) Each control panel is fitted with a redundant power supply as per *Purchaser's* design drawings (refer to Appendix C).
- b) The 10A double pole MCB is installed to isolate the 110V DC coming into the panel. The double MCB installed have a relay contact for monitoring of failures.
- c) The incomers are connected to the 110V/24V DC power supply convertor. The 24V DC power supplies installed have a relay contact for monitoring of failure.
- d) The 24V DC diode module is fitted to couple the parallel supplies before distributing to the devices or I/O modules.
- e) Provision is made to supply devices such as solenoids with a combined 110V DC from a junction diode module.
- f) The 24V DC powers the peripheral lines (i.e. PLC and modules) via the 10A double pole MCB.
- g) The 24V DC powers other devices (i.e. insulating monitoring, signal insulator, megawatt transduces, etc.) via a 6A double pole MCB.
- h) Two-amp fuse is used for the wetting supply of each module.

3.2 Main Unit Controller and Remote I/O's panels

- a) The *Supplier* manufacture standard size panel enclosures that are joined together for the MUC and its Remote I/O as per *Purchaser's* design drawing specification (refer to Appendix C).
- b) The panels have access doors on the front and rear.
- c) Each panel is installed with two mounting (back) plates:
 - 1. The mounting plate in the front section is fitted with PLC components and the associated I/O modules, power supplies, relays, MCBs and fuses.
 - 2. The mounting plate in the rear section is fitted with terminals for interfaces between field cables and internal wiring.
 - 3. The mounting plates have access holes to route the internal wiring from PLC components to the terminal on the rear mounting plate.
- d) The *Supplier* utilise the following drawing set to perform the internal wiring of the panels:

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

1. 18.39/U*/2735 for panel *0CJA10GH001 and *0CJA11GH002
 2. 18.39/U*/2736 for panel *0CJA30GH001
 3. 18.39/U*/2737 for panel *0CJA31GH001
 4. 18.39/U*/2738 for panel *0CJA40GH001
- e) Line three of the I/O modules for the Remote I/O's (*0CJA30GH001 and *0CJA31GH001) is terminated on each side of the panels as indicated by drawings.
- f) The front door of the panel enclosure for the Remote I/O (*0CJA30GH001) is installed with the following:
1. 1 x Cut-out for a 25inch HMI monitor with a cut-out dimension 354.2mm (H) x 571mm (W). The *Supplier* is responsible to obtain the final dimension from the *Supply Manager* before the contract is awarded as the specification of the monitor may change.
 2. 1 x Key selector switch
 3. 1 x Quick shutdown pushbutton
- g) All panels are fitted with gland plates for cables to enter at the bottom of the panels except Remote I/O's Panel (*0CJA30GH001 and *0CJA31GH001).
- h) The cable entry for Remote I/O Panel (*0CJA30GH001 and *0CJA31GH001) is from the top of the panel.
- i) Remote I/O (*0CJA30GH001) panel is fitted with cable guiding routing with a swivel joint for the wiring of components on the door.
- j) The panels are fitted with removable eyebolts for lifting.

3.3 Unit Temperature and Speed Monitoring panels

- a) The *Supplier* manufacture standard size panel enclosures that are joined together for the Temperature and Speed Monitoring as per *Purchaser's* design drawing specification (refer to Appendix C).
- b) The panels have access doors on the front and rear.
- c) Each panel is fitted with a single mounting (back) plate for the PLC components and the associated I/O modules, power supplies, relays, MCBs and fuses.
- d) The *Supplier* utilise the following drawing set to perform the internal wiring of the panels:
4. 18.39/U*/2741 for panel *0CHB20GH001 and *0CHB21GH002
- e) The *Supplier* installs the internal wiring of the Temperature and Speed Monitoring on the side section of the second panel (*0CHB21GH002).
- a) The panels are fitted with gland plates for cables to enter from the bottom of the panels.
- f) The panels are fitted with removable eyebolts for lifting.

3.4 Unit Turbine Governor Control panels

- b) The *Supplier* manufactures a standard size panel enclosure for the Turbine Governor Control as per *Purchaser's* design drawing specification (refer to Appendix C).
- c) The panel have access doors on the front and rear.
- d) The panel is fitted with a single mounting (back) plate for the PLC components and the associated I/O modules, power supplies, relays, MCBs and fuses.
- e) The front door of the panel enclosure is installed with the following:
5. 7 x Analogue gauges
 6. 2 x Cam type selector switches
 7. 2 x Key selector switches

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

8. 6 x Pushbuttons with indication (LED bulbs)
 9. 9 x Lamp indications (LED bulbs)
- f) The *Supplier* utilise the following drawing set to perform the internal wiring of the panel:
10. 18.39/U*/2740 for panel *0MEY20GH001
- g) The terminals are installed on each side of the panel for interfaces between field cables and internal wiring.
- h) The panel is fitted with gland plates for cables to enter from the bottom of the panel.
- i) The panel of the Turbine Governor Control is joined to the first panel of the Temperature and Speed Monitoring (*0CHB21GH001).
- j) The panel is fitted with cable guiding routing with a swivel joint for the wiring of components on the door.
- k) The panel is fitted with removable eyebolts for lifting.

3.5 Station Controller and Remote I/O

- a) The *Supplier* is to manufacture a standard size panel enclosure for the Station Controller and the Remote I/O panel as per *Purchaser's* design drawing specification (refer to Appendix C).
- b) The panels have access doors on the front and rear.
- c) Each panel is installed with a mounting (back) plate. The mounting plate is installed with PLC components and the associated I/O modules, power supplies, MCBs and fuses.
- d) The terminals are installed on each side of the panel for interfaces between field cables and internal wiring.
- e) The *Supplier* utilise the following drawing set to perform the internal wiring of the panels:
11. 18.39/2745 for panel 00CJA10GH001
 12. 18.39/2746 for panel 00CJA40GH001
- f) The front door of the panel for the Remote I/O have a cut-off for a 25inch LCD monitor with a cut-out dimension 354.2mm x 571mm. The *Supplier* is responsible to obtain the final dimension from the *Purchaser* after the contract is awarded as the specification of the monitor may change.
- g) The panels are fitted with gland plate for cables to enter from the bottom of the panels.
- h) The panels are fitted with removable eyebolts for lifting.

3.6 National Control and Standby Control

- a) The *Supplier* manufactures a standard size panel enclosure for the National Control and Standby Control as per *Purchaser's* design drawing specification (refer to Appendix C).
- b) The panel have access doors on the front and rear.
- c) The panel is installed with two mounting (back) plates for the PLC components.
- i) The *Supplier* utilise the following drawing set to perform the internal wiring of the panels:
13. 18.39/2747 for panel 00CYG10GH001
 14. 18.39/2748 for panel 00CYG11GH001
- d) The panel is fitted with gland plates for cables to enter from the bottom of the panel.
- e) The panel is fitted with removable eyebolts for lifting.

3.7 Panel Size and Quantity:

Description	Size (mm)	Quantity
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SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Description	Size (mm)	Quantity
Main Unit Controller Panel	2000(H) X 800(W) X 800(D)	4
Unit Turbine Control Governor	1800(H) X 800(W) X 600(D)	2
Unit Temperature and Speed Monitoring	1800(H) X 800(W) X 600(D)	4
Unit Remote I/O Generator	2000(H) X 800(W) X 800(D)	2
Unit Remote I/O Turbine	2000(H) X 800(W) X 800(D)	2
Unit Remote I/O Common	2000(H) X 800(W) X 800(D)	2
Station Control Panel	2000(H) X 800(W) X 800(D)	1
Station Remote I/O Panel	2000(H) X 800(W) X 800(D)	1
National Control Centre	2000(H) X 800(W) X 800(D)	1

3.8 Earthing

- Each panel have earthing studs inside and on the doors.
- Braided copper wire earth strap (lead) is used to connect the protective earth for the panel enclosure.
- The mounting plate is fitted with a copper busbar and non-fused terminal blocks for shield signal cable shield terminations.

3.9 Wiring and Termination

- The fuse terminal of the wetting supply is of classic Phoenix Contact type with no LED.
- The terminals used for the field instruments, interfaces to different panels, and other devices are of the rail mounted screw clamp spring loaded insertion type where terminations or lugs are compressed between two plates by means of terminal screws. Terminals are spring loaded such that the action of the springs is independent of the action of the terminal screws.
- The spring-loaded terminal is of linked terminal which can be replaced with fuses.
- The end of the terminal strip to be cover with a compatible Endplate.
- Terminal strips are labelled with terminal group markers and terminals are labelled numerically.
- All components and devices are secured by End-stops on either side.
- Multi-strand copper wire is used with 1mm² for all internal wiring (control signal) and 1.5mm² for power distribution wiring.
- Control and power panel wiring sheaths are coloured red and black for single phase AC circuits, grey for DC circuits, and green and yellow for earthing.
- Control wiring has sufficient length to reach the component plus an additional length to facilitate changes in wiring. The slack appears as close as possible to the component in the form of a loop.
- There is no bare wire or loose strands exposed between a lug and the insulation of the wire to which the lug is crimped.
- The use of an approved wire-stripping device is required and stripping of insulation does not cause damage to conductors or the remaining insulation.
- Lugs are compatible to the wiring. The same supplier lugs are used throughout the panels.
- Lugs fits cross-area of the conductor to which they are crimped. The correct crimping tool is used.
- Bootlace ferrules are acceptable for signal wiring terminated on devices and modules. The correct crimping tool is used (minimum six di crimper).
- Where two conductors are connected to a terminal, lugs and ferrules to be fitted in such a manner as to allow the wires to be terminated in parallel.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

- p) Wiring to relay bases do not interfere with adjacent relay bases or components.
- q) No more than two lugs per terminal.
- r) Wiring is neat, braced and placed in secure PVC grey slotted panel trunking to prevent vibration and the possibility of forces being exerted on termination arrangements. Stick on plastic bracing support is not allowed.
- s) Wiring on swing doors are arranged to give a twisting motion and not a bending motion to wires. Robust wiring looms at doors are used with clamps on both ends.
- t) A sample of each type of lug, wires, tools, and finished connection is submitted to the *Project Manger* for acceptance before wiring commences.

3.10 Labelling and Core Wiring Tag

- a) The *Supplier* labels the control panels with the full KKS codes as provided by the *Purchaser*.
- b) All components and equipment within the control panels are labelled at KKS level 3. KKS coding conforms to the 240-93576498 and 240-109607736 standard.
- c) Component's label identifying each component including terminal strips, terminals, fuses, links, etc.
- d) Core wiring tags used in the panels are of the Graphoplast type, i.e. 23mm tag sleeve and yellow PVC tag.
- e) Horizontal Terminal Strip: Tag is readable from left to right.
- f) Vertical Terminal Strip: Tag is readable from bottom to top.
- g) Each device installed in the panel is labelled according to KKS standards using Graphoplast Self-adhesive white PVC tags. Where the device is replaceable, the label is repeated on the mounting plate.
- h) All text is black.
- i) Prior to labelling of components and panel nameplate, the *Supplier* submits a sample to the *Purchaser*.

3.11 Panel Labelling

The control panel labelling (nameplates) is required to identify each panel from the front and back. Refer to the Plant Labelling and Equipment Description Standard 240-71432150 for detailed labelling information, though high-level requirements are mentioned below for ease of reference:

3.12 Material

- a) The nameplate is created with white graflux and uses a slid in aluminium holder.
- b) Colour coded plastic should be used for internal panels.
- c) Label thickness: 1.5mm.

3.13 Ergonomic Requirements

- a) Consistency maintained when attaching labels on the panels.
- b) Labels are fitted in a manner not to hamper routine operation and maintenance activities.
- c) The location of labels on an item should ensure readability during normal operation of plant without compromising identity of exact equipment. If not possible, consult Eskom.
- d) Labels are mounted so that the text runs in a horizontal plane reading from left to right to the nearest fixed point that is being described.
- e) In case of space constraints, labels are mounted vertically, the method of text reading is from bottom to top.

3.14 Environmental Factors

All plant labels are as permanent as the normal life expectancy of the plant and be capable of withstanding the following environmental conditions:

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

- a) Rain
- b) Hail
- c) Temperature variance as required by plant
- d) Wind and Dust erosion
- e) Ultraviolet rays (sun)
- f) Corrosion

3.15 Notation of KKS Code

Single spacing between unit, system, equipment, and components as per 240-71432150 standard is used in all labels.

3.16 Engraving

- a) Arial font is used on all labels.
- b) Standard vertical characters are used.
- c) Narrow (condensed), broad (extended) characters are not acceptable.
- d) Horizontal lines are evenly spaced amongst the height of the label.
- e) If the label description is too long to fit in one line and requires going over multiple lines, it should be spread evenly across the height of the label.
- f) All labels have character fill in black.
- g) Label Type GH – Point of Installation Code Labels for Process Control and Electrical Equipment PLC's Measurement Panels, Protection Panels, Measurement Racks, Local Alarm Panels:
 - 1. Alphanumeric Characters: 10mm High.
 - 2. White background.
- h) Label Type EK/L – Electrical and C&I Component Labels:
 - Fixing Method: Adhesive.
 - 1. Alphanumeric Characters: 4.5mm High.
 - 2. White background.

3.17 Codification

- a) Vanderkloof Hydroelectric Power Station subscribes to the KKS codification. All drawings and equipment lists are coded according to the KKS codification including descriptions.
- b) The *Supplier* utilise the KKS codification when labelling devices and components, which is provided with the concept drawing of the *Purchaser*.

Specification of the services to be provided

The *Supplier* adheres to the following specifications and standards as a minimum, in providing the *works*. The *Supplier* ensures the latest revisions and amendments of these documents are to be used for the *works*.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

This Contract is carried out in accordance with this Specification (including Schedule B and Contract drawings) and with the documents listed below

The documents listed below apply to the *works* and the equipment regardless of the applicability stated in the individual documents.

Document Number	Document Title
240-54179170	Eskom's Classification and Designation of Technical Documentation Standard
240-86973501	Eskom's Engineering Drawing Standard
32-644	Eskom Documentation Management Standard
240-109607332	Eskom Plant Labelling Abbreviation Standard
240-71432150	Plant Labelling and Equipment Description Standard
240-75655504	Corrosion Protection Standard for New Indoor and Outdoor Eskom Equipment, Components, Materials and Structures Manufactured from Steel Standard
240-56227589	List of Approved Electronic Devices to be Used on Eskom Power Stations Standard
240-70413291	Specification for Electrical Terminal Blocks
240-93576498	KKS Coding Standard
240-109607736	Eskom KKS Keypart Standard
240-53114002	Engineering Change Management Procedure
240-53113685	Design Review Procedure
GG5 0462	Quality Requirements for Engineering and Construction Work in Generation
ISO 9001	Quality Management Systems

The *Supplier* demonstrate high-level of skills, professionalism and expertise when planning and executing the Work. The work to be delivered should meet a standard of quality that is acceptable by the *Purchaser* and should be functional, safe, and usable.

Constraints on how the *Supplier* Provides the Goods

Programming constraints

- The *Supplier* submits a bar chart programme in MS Project detailing how the *works* will be executed within the stipulated dates.
- The programme indicates the start date, Completion Date and duration of each activity.

Work to be done by the Delivery Date

On or before the Completion Date the *Supplier* has done everything required to Provide the Works. The *Supply Manager* cannot certify Completion until all the work has been done and is also free of Defects which would have, in his opinion, prevented the *Purchaser* from using the *works* and others from doing their work.

- The *Supplier* checks the delivery and verify each component according to the delivery list. The *Purchaser* witness the process.
- Once delivered the panels will be powered as per the FAT process at the *Purchasers'* premises.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

c) All documents have been accepted and received by the *Supply Manager*.

Access given by the *Purchaser* for correction of Defects

Should Defects or damage be noted after delivery of the *works*, the *Purchaser* provides the *Supplier* access to where the *works* is stored to correct the Defects or to remove the *works* to be corrected off site.

Marking the *goods*

N/A

Constraints at the delivery place and place of use

N/A

Cooperating with Others**Services & other things to be provided by the *Purchaser* or *Supplier***

The *Purchaser* provides the *Supplier* with the crane for offloading of the panels.

Management meetings

Meetings of a specialist nature may be convened as specified elsewhere in this Goods Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings are submitted to the *Supply Manager* by the person convening the meeting within five days of the meeting.

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

Documentation control

All contractual communications are through formal compiled letters or forms on the company's letterhead

The formal letters and or forms are attached to e-mails and not as a message in the e-mail itself

The receiver of the formal letters or forms signs off an acknowledgment of receipt of the communication and returns the acknowledgement of receipt to the sender of the formal communication.

Health and safety risk management

The *Supplier* complies with the health and safety requirements contained in Appendix A to this Goods Information.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

MANUFACTURING, SUPPLY AND SUPPLY OF CONTROL PANELS FOR VANDERKLOOF POWER STATION (DELIVERY TO ACACIA POWER STATION – CAPE TOWN)

The *Contractor* shall submit a detailed and comprehensive **Safety, Health and Environmental Plan in relation to (development of assembly drawing, procurement of components and consumables, manufacture, assembly, factory acceptance testing, supply, delivery off-loading, of complete control panels for two units and station common plant)** as required by amongst others the, General Administration Regulations, General Safety Regulations of the Occupational Health and Safety Act 85 of 1993, Eskom's SHEQ Policy 32-727, Eskom's Permit to Work System, specifically the Plant Safety Regulations that addresses work in confined spaces, 32- 418 - Work at Height, 167A/271: Health and Safety Requirements for Contractors, etc. which will include amongst others:

- A **valid and verified** Letter of Good Standing (**mandatory**)
- **Annexure B:** Acknowledgement Form for Eskom OHS legal and other requirements
- Risk Assessments including a Fall Protection Plan that must include a detailed fall rescue plan, especially since work at height will be required; mitigation of slip and fall hazards in the Surge Shaft or waterways; Personal Protective Equipment, etc.;
- Appropriate statutory appointments specific to the risks of the tasks, e.g. a competent fall protection plan developer, competent risk assessment developer, rescuers, first aiders , etc
- Medical Certificates of Fitness issued by a registered occupational health practitioner or occupational medicine practitioner.
- Method Statements/Procedures that specifically address the tasks and their hazards regarding for **(development of assembly drawing, procurement of components and consumables, manufacture, assembly, factory acceptance testing, supply, delivery off-loading, of complete control panels for two units and station common plant)**
- Competencies specific to the task like offloading certificates and SAPS criminal clearance.

The *Contractor* and his personnel will attend an induction meeting on site that will detail site health and safety requirements and expectations during the contract, e.g., actions required during an emergency, incident accident reporting, worker identification, security requirement, etc. *Contractor* employees will be required to sign the attendance sheet provided as proof of attendance.

The *Contractor* is responsible for the medical treatment of his/her personnel should it be required and must adhere strictly to the requirements of COID and the contract.

General Safety

- The Contractor must submit a detailed and comprehensive Safety Health and Environmental Plan as required by amongst others the Construction Regulations, Hazardous Chemical Substances Regulations, General Administration Regulations, General Safety Regulations of the Occupational Health and Safety Act 85 of 1993, Eskom's SHEQ Policy 32-727, 167A/271: Health and Safety Requirements for Contractors, etc. which will include amongst others:
- Method statements for all activities should be part of the safety file and plan.
- A Letter of Good Standing (compulsory):
- Appropriate statutory appointments.
- Medical Certificates of Fitness issued by registered Occupational Health Practitioners.
- Method Statements/Procedures for all tasks as identified in the Risk Assessments especially when coming to delivering of the goods to site.

The Contractor and his personnel will attend an induction meeting on site and sign the attendance sheet provided as proof of attendance.

The Supplier shall ensure that adequate precautions are taken to avoid fire hazards, as required by the General Safety Regulations, Construction Regulations of the Act, and any Eskom requirement related to fire risks.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Environmental constraints and management

- a) The *Supplier* shall comply with the environmental criteria and constraints [stated here as well as contained in Annexure A] Eskom's goal is to ensure zero harm to the environment, and to ensure that any possible impact is mitigated or managed. The Duty of Care and implementation of best practice is critical during operations, and full communication on environmental issues is required at all times.
- b) All processes are subject to environmental review throughout the contract.
- c) The *Supplier* complies with all National and Local legislation requirements as well as Eskom procedures and policy.
- d) The following applies to promote Eskom's goal of zero harm to the environment:
 - 1. Respect and care for the natural environment and for each other
 - 2. Minimise or mitigate any impacts that may cause harm or pollution to the environment
 - 3. Report immediately an environmental incident requiring action, such as a spill
- e) The *Supplier* develops a method statement/ operational plan for the management of waste material that is accepted by the *Supply Manager* before site implementation
- f) The method statement on waste management includes the identification of possible waste streams, temporary storage and disposal options for each waste type, and contingency plans in the case of any environmental incident.
- g) The method statement on waste management includes / specifies:
 - 1. Demarcated storage areas are located in such a manner that it can provide optimum handling and transportation of waste material
 - 2. Stored in suitable labelled containers or drums / sealed if hazardous in bunded areas or spill platforms to prevent pollution or harm to the environment
 - 3. Duty of care and implementation of best practise
- h) The *Supplier* provides Safety Data Sheets for all chemical or hazardous / potentially hazardous material brought onto site.

Quality

- a) Quality management for the *works* is in accordance with Category 3: Eskom Quality Supplier Management Specification 240-105658000 (QM-58).
- b) The *Supplier* complies with the latest version of the ISO 9001 Quality Management System Requirements
- c) The *Supplier* defines the level of QA/QC or inspection imposed on his subSuppliers and *Supplier's*.
- d) The programming of inspections, hold and witness points are agreed between the *Purchaser* and the *Supplier* prior to undertaking any of the *works*.
- e) The QCP's make provision for signatures indicating Completion by the *Supplier* and acceptance by the *Purchaser* at the end of each activity.
- f) All technical design and implementation documentation and the QCP's are submitted to the *Purchaser* for acceptance prior to the *works* being executed.
- g) The *Supplier* is made aware of the requirement that all documents or designs submitted for review to the *Supply Manager* for acceptance, requires a process of review.
- h) The quality requirements are as per ISO 9001:2015 and as per Eskom document QM-58, SUPPLIER QUALITY MANAGEMENT SPECIFICATION. The quality requirements are as per the GGS 0462 standard.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

- i) The *Supplier* complies with the requirements as stated on document the latest copy of Supplier Quality management Specification: 240-105658000 regarding Quality Management Plan for his sub-*Suppliers* and suppliers of material.
- j) The *Supplier* documents all inspections as part of the quality assurance and control procedures. These documents are handed to the *Purchaser* as records.

5.11.1 Product Support

All components and devices supplied by the *Supplier* have a useful life of 12-15 years and are supported for by their respective OEMs over this period.

5.11.2 Defect's correction

- a) The *Supplier* clearly states, in writing, the warrantee period on their product and the components supplied.
- b) Beyond the *defects date*, the *Supplier* still has the ability to do repairs on faulty components. If this is not possible then the *Supplier* provides an exchange policy to the *Purchaser* where faulty electronic devices can be exchanged for new devices at a discounted price to the *Purchaser*.
- c) During the warrantee period the faulty devices are to be investigated by the *Supplier* and a failure report provided to the *Purchaser* stating the reason for failure.
- d) The *Supplier* inspects the control panels on or before the *defects date* and provides the *Purchaser* with an inspection report.
- e) The *Supplier* liaises with the *Purchaser* three months prior to the *defects date* to confirm availability.
- f) The *Supplier* corrects all Defects identified before the *defects date*.

5.11.3 Plant & Materials provided “free issue” by the *Purchaser*

The list below is the components that the *Purchaser* is going to issue to the *Supplier* during manufacturing of the panels.

Items	Module Type	Description
1	CP-8050	Processor Module
2	AO-8380	Analog Output Module (± 20 mA, ± 10 mA, ± 10 V)
3	AI-8310	Analog Input Module (Pt100/Pt1000/Ni100)
4	AI-8320	Analog Input Module (4 x ± 20 mA/ ± 10 V)
5	DI-8110	Binary Input Module (2 x 8, DC 24 V)
6	DO-8212	Binary Output Relay Module (8 x DC 24...220 V/AC 230 V)
7	CI-8520	Ethernet Communication Module
8	PS-8640	Power Supply DC 24...60 V (45 W)
9	CI-8551	Communication Interface Serial
10	AI-8510	Analog Input 3 x U (direct), 3 x I (LoPo)
11	TE-6420	Speed Acquisition 2x2 5/24VDC/NAMUR
12	CM-6812	Coupling SICAM TM I/O Module
13	CM-8811	I/O Coupling Module CP-8000
14	CM-8830	SICAM I/O Module LED Unit
15	CI-8530	SICAM I/O Remote 24-60VDC el.
16	CI-8531	SICAM I/O Remote 24-60VDC F/O
17	SINEAX P530	Transducer for Active Power
18	EVG	Amplifier/ Dither Module
19	SI1010L	Signal Insulator

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

5.11.4 Supplier's procurement of Plant and Materials

The components, materials, and consumables that the *Supplier* procures and use during the manufacturing of the control panels is listed in Appendix A Schedule A. Alternatives may only be used with the *Supply Manager's* acceptance.

5.11.5 Spares and consumables

- a) The *Supplier* supplies critical spares and additional consumables, their quantities are listed in Appendix B.
- b) The *Supplier* includes the itemised cost of the spares as part of the supply.
- c) The *Purchaser* performs an assessment of the spares list provided by the *Supplier* and from this select spares that are retained by the *Purchaser* and is used in the event of failure.

Invoicing and payment

- a) Within one week of receiving a payment certificate from the *Supply Manager* in terms of core clause 51.1, the *Supplier* submits a tax invoice to the *Purchaser*, showing the amount due for payment equal to that stated in the *Supply Manager's* payment certificate.
- b) The *Supply Manager* to be copied in on all electronic invoices emailed.
- c) Failure to submit the invoice to the correct address could result in delays in payment.
- d) The *Supplier's* Tax Invoices comply with the requirements as stated in clause Z7 of the Contract Data
- e) Invoices are submitted electronically to:
 1. Local Eskom Invoices - invoiceseskomlocal@eskom.co.za
 2. Foreign Eskom Invoices - invoiceseskomforeign@eskom.co.za
- f) Details required when submitting invoices and additional data:
 1. The subject line on your email should only contain your vendor number
 2. Each invoice in PDF should be named with your invoice number only
 3. All electronic invoices are sent in PDF format only
 4. Attach the proof of delivery to your invoice
 5. Where applicable, supporting documents is attached to the scanned PDF invoice as one attachment
 6. A copy of the signed assessment certificate
 7. CPA calculation sheet
 8. Retention Certificate where it is a retention invoice
 9. Any other appropriate documents, e.g.
 - For shipping invoices, please ensure the following documents are attached
 - Invoice (this should only reflect the shipping cost)
 - Commercial invoice
 - Delivery note
 - Your shipping costs calculation relevant to that invoice – not a generic calculation (The amount of the shipping costs calculation has to balance on the amount on the invoice.)
 - Forwarding agent's invoice
 - The customs document

Please do not attach unnecessary documents as this will make the file too large

- g) Other requirements:
 1. For foreign invoices, suppliers will still be required to physically deliver hard copies of original documents to the respective Document Management centres even though the invoices have been submitted electronically
 2. Ensure compliance with the tax requirements for submitting invoices electronically
 3. Each PDF should contain one credit note, one debit note or one credit note only. More than one invoice can be submitted per email

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

4. Any CPA applicable is invoiced separately, so that if there are issues on the CPA, the rest of the invoices can be paid while the CPA issues are resolved
- h) Include the following information on the Invoice:
1. Name and address of the *Supplier* and the *Supply Manager*
 2. The contract number and title
 3. *Supplier's* VAT registration number
 4. The *Purchaser's* VAT registration number 4740101508
 5. Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT
 6. *Supplier's* company registration number if applicable
 7. *Supplier's* banking details
 8. Name and address of recipient
 9. Tax invoice number and date of issue
 10. Description of goods/service provided
 11. Quantity or volume of goods/services
 12. Period time for which the Tax Invoice is being rendered
 13. Relevant Task Order Number (commencing with a 45 prefix)
 14. Relevant line-item number
 15. Statement whether value added tax is included or excluded.

Insurance provided by the *Purchaser*

- a) In terms of clause 85, before the *starting date* and on each renewal of the insurance required in terms of this contract, the *Supplier* is required to submit certificates which state that the insurance required by this contract is in force.
- b) Such insurances are those required in terms of the contract except to the extent stated in the contract the *Purchaser* is to provide any, or any part, of them.
- c) Failure to provide such certificates of insurance for the *Supply Manager's* acceptance by the *starting date* or renewal date as the case may be, may result in the *Purchaser* arranging such insurance on the *Supplier's* behalf and at the *Supplier's* expense.

Contract change management

- a) Contract change management is managed in accordance with section 6 of the core clauses in ECC3. In summary, if the *Purchaser/Supplier* notices a change, an event register is issued. If the event/change has cost implications, then a quotation is submitted with the event register.
- b) The *Supply Manager* assesses the quotation and gives an instruction in writing to the *Supplier*.

Provision of bonds and guarantees

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

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

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Records of Defined Cost, payments & assessments of compensation events to be kept by the *Supplier*

In order to substantiate the Defined Cost of compensation events, the *Purchaser* requires the *Supplier* to keep records of amounts paid by him, in the following format:

Type of cost	Type of record
People employed by the <i>Supplier</i> (labour)	Signed time sheets and payslip
Accommodation	Substantiating documentation (actual paid invoices)
Material	Register and substantiating documentation of materials used /paid invoices
Equipment	Register and substantiating documentation of Equipment used /paid invoices

Procurement**Subcontracting****Preferred sub-Contractors**

N/A

Limitations on subcontracting

N/A

Spares and consumables

- d) The *Supplier* supplies critical spares and additional consumables, their quantities are listed in Appendix B.
- e) The *Supplier* includes the itemised cost of the spares as part of the supply.
- f) The *Purchaser* performs an assessment of the spares list provided by the *Supplier* and from this select spares that are retained by the *Purchaser* and is used in the event of failure.

Other requirements related to procurement

N/A

Cataloguing requirements by the *Supplier*

N/A

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

List of drawings

Drawings issued by the *Purchaser*

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

Note: Some drawings may contain both Goods Information and Site Information.

Drawing number	Revision	Title
18.39/U*/2735	0a	U* Main Unit Controller
18.39/U*/2736	0a	U* MUC Remote IO Generator
18.39/U*/2737	0a	U* MUC Remote IO Turbine
18.39/U*/2738	0a	U* MUC Remote IO Common
18.39/U*/2740	0a	U* Turbine Governor Control
18.39/U*/2741	0a	U* Temperature Speed Monitoring
18.39/2745	0a	Station Controller Panel
18.39/2746	0a	Station Remote IO Panel
18.39/2747	0a	National Control Centre Panel
18.39/2748	0a	Standby & Regional Control Centre Panel

APPENDIX A: SCHEDULE A&B

TECHNICAL REQUIREMENTS

1.1. GENERAL

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

The technical requirements of this section specified under 'Schedules A and B' form part of the *Purchaser's* enquiry documentation. Schedule B to be completed by the *Supplier* and submitted with the tender documents.

1.2. SCHEDULE A AND B

Schedule A: Particular of *Purchaser's* Requirements

Schedule B: Guaranteed technical particulars of equipment offered in response to Schedule A requirements by the *Supplier*.

1.3. FILLING IN INSTRUCTIONS

- 1.3.1. Where the *Supplier* does not fully comply with the *Purchaser's* requirement, any deviations must be clearly indicated in Schedule B and listed in the Deviation Schedule (Annexure B).
- 1.3.2. Where there is a need to substantiate or further describe an item in Schedule B, especially in instances of non-compliance with Schedule A, particulars are furnished on a separate sheet clearly marked with the notation of the Schedule A item referred to.
- 1.3.3. If a blank space is left in Schedule B next to certain requirement specified in Schedule A, this constitutes a confirmation that the tender does not comply with that specific requirement.

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Schedule A: Particular of Eskom requirements.**Schedule B:** Guaranteed and technical particulars of equipment offered.

Item	Description	Units	Schedule A	Schedule B
1	PANEL ENCLOSURE			
1.1	OEM:		Schneider Electric or Rittal	
1.2	Location of ASSEMBLIES		indoor	
1.3	Life Expectancy Period	Years	15	
1.4	Panel design: Off the shelf assembly		Standard	
1.5	It can be extended or modified using off the shelf components		Yes	
1.6	Size and quantity: as per section 5.2.9		Yes	
2	PANEL ASSEMBLIES			
2.1	Form Factor			
2.1.1	Mild steel single door combinable floor standing enclosures		Yes	
2.2	Material			
2.2.1	Frame: 1.5mm painted steel	mm	1.50	
2.2.2	Front and rear doors: 2mm painted steel	mm	2.00	
2.2.3	Roof and side panels: 1.5mm painted steel	mm	1.50	
2.2.4	Mounting plate: 3mm galvanised steel	mm	3.00	
2.2.5	Bottom (gland) plates: 2.5mm galvanised steel (with 2 entries)	mm	1.50	
2.3	Frame			
2.3.1	Seam welded reversed open profiles with 25mm hole pattern		Yes	
2.3.2	Integrated external hole pattern		Yes	
2.4	Doors			
2.4.1	Mounted with four hinges allowing left- or right-hand opening		Yes	
2.4.2	Door frame with 25mm hole pattern and steel door retainer		Yes	
2.5	Roof Panel			
2.5.1	Removable		Yes	
2.6	Lock/Handle			
2.6.1	Espagnolette 4-point locking system		Yes	
2.6.2	Standard double-bit lock with 3mm insert		Yes	

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Item	Description	Units	Schedule A	Schedule B
2.6.3	Standard inserts, cylinders, and lift handles, common keys for all the panels. Keys can be removed from the lock, on the open or close position. All keys are interchangeable between panels.		Yes	
2.7	Mounting Plate			
2.7.1	Double folded and slides into position (depth adjustable)		Yes	
2.8	Plinth/Baseplate			
2.8.1	200mm height with levelling ability for a 2000mm height panel	mm	200	
2.8.2	100mm height with levelling ability for a 1800mm height panel	mm	100	
2.8.3	Colour: RAL 7022 grey		Yes	
2.9	Earthing			
2.9.1	Earth stud size			
2.9.2	16mm ² Braided strap		Yes	
2.10	Surface Finishing			
2.10.1	Panel enclosure: Dip-coat primed and structured powder coating in RAL 1015 (light ivory colour)		Yes	
2.10.2	Mounting plate: Zinc plated finish colour painted white		Yes	
2.11	Protective Category			
2.11.1	IP 55		Yes	
2.11.2	Complies with NEMA 12		Yes	
2.12	Lifting			
2.12.1	Moulded galvanised-steel removable eyebolts/lifting brackets to connect to the framework of the enclosure, in line with the uprights		Yes	
2.13	Cable Gland Plate			
2.13.1	The design of the compact cable gland plate, coupled with the use of sealing gasket to enable the maximum dust/water tightness		Yes	
2.13.2	The gland plate is a multiple sheet with a minimum of 200mm depth with 10mm 90 degrees bend on each end. See figure 25 for gland plate design sample.		Yes	
2.13.3	Type: plain cable gland plate		Yes	
2.13.4	Material: Galvanised steel (Sheet steel)		Yes	
2.13.5	Thickness: 2.5mm		Yes	
2.13.6	Surface finishing: unpainted galvanise (Zinc plate)		Yes	

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Item	Description	Units	Schedule A	Schedule B
3	ELECTRICAL AND ELECTRONIC COMPONENTS			
3.1	Power Supply			
3.1.1	OEM:		Phoenix Contact	
3.1.2	Type: Quint-PS (Power Supply) 1AC/24DC/20		Yes	
3.2.	Diode Module			
3.2.1	OEM:		Phoenix Contact	
3.2.2	Type: Quint-Diode 12-24DC/2X20/1X40 Redundancy Module		Yes	
3.3	Diode Combiner			
3.3.1	OEM:			
3.3.2	Type: Standard Diode Power Modules, Common Cathode		Yes	
3.3.3	Rating: 100-1000V	V	110	
3.3.4	Part number: VSK91/04		Yes	
3.4	Isometer Insulation Monitor			
3.4.1	OEM:		Bender	
3.4.1	Type: IR425		Yes	
3.4.3	Rating: 16-72V AC, 9.6-94V DC, Aux. contact: 2CHO		Yes	
3.5	MCB's			
3.5.1	OEM:		Schneider Electric or Hager	
3.5.2	Type: C-Curve		Yes	
3.5.3	Rating: 240/415V AC 4A, 6A and 10A	A	4, 6, and 10	
3.5.4	Number of poles:		2	
3.6	MCB			
3.6.1	OEM:		Schneider Electric or Hager	
3.6.2	Type: Residual current C-Curve		C-Curve	
3.6.3	Rating: 230V AC, 16A	A	16	
3.6.4	Number of poles: 1+N		1+N	
3.7	Enclosure Heater			
3.7.1	OEM:		Schneider Electric or Rittal	
3.7.2	Type: SK Enclosure Heater		Yes	
3.7.3	Rating: 110-240V AC/DC, 50W		Yes	

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Item	Description	Units	Schedule A	Schedule B
3.8	Enclosure Light			
3.8.1	OEM:		Schneider Electric or Rittal	
3.8.2	Type: Universal ceiling mount light, with socket (combination of three pin, two pin and USB) and motion sensor.		Yes	
3.8.3	Lamp		LED	
3.8.3	Rating: 110-240V AC, 26W	V	240	
3.9	Enclosure Thermostat			
3.9.1	OEM:		Schneider Electric or Rittal	
3.9.2	Type: SK Enclosure Internal Thermostat		Yes	
3.9.3	Rating: 24-230V AC 24-60V DC	V	230	
3.10	Key Type Switch			
3.10.1	OEM:		EAO or Kraus & Naimer	
3.10.2	Dimension:	mm	48 x 48	
3.10.3	Rating: 690V, 20A		Yes	
3.10.4	Keys are usable to all key type switch		Yes	
3.11	Cam Type Switch			
3.11.1	OEM:		EAO or Kraus & Naimer	
3.11.2	Handle: G521		Yes	
3.11.3	Dimension: 48x48mm	mm	48 x 48	
3.11.4	Rating: 690V, 20A		Yes	
3.11.5	Position: (0-1-TEST)		3	
3.12	Cam Type Switch			
3.12.1	OEM:		EAO or Kraus & Naimer	
3.12.2	Handle: G521		Yes	
3.12.2	Dimension: 48x48mm	mm	48 x 48	
3.12.3	Rating: 690V, 20A		Yes	
3.12.4	Position: 2		2	
3.13	Lamp Indication			
3.13.1	OEM:		EAO	
3.13.2	Type: Flush indicator		Yes	
3.13.3	Dimension:	mm	48 x 24	

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Item	Description	Units	Schedule A	Schedule B
3.13.4	Lamp: 24V DC		Multiple LED	
3.13.5	Lens Colour: Refer to drawing		Yes	
3.14	Pushbutton			
3.14.1	OEM:		EAO	
3.14.2	Type: Flush pushbutton		Yes	
3.14.3	Dimension: 48x24mm	mm	48 x 24	
3.14.4	Lamp: 24V DC		Multiple LED	
3.14.5	Lens Colour: Refer to drawing		Yes	
3.15	Emergency stop switch			
3.15.1	OEM:		EAO	
3.15.2	Type: Emergency stop, with failsafe switching element and protective shroud			
3.15.3	Rating: 24V DC		Yes	
3.16	Measuring Instrument (Gauge)			
3.16.1	OEM:		Weigel	
3.16.2	Type: Analog Meter Gauge		Yes	
3.16.3	Input Current	mA	0/4-20mA	
3.16.3	Voltage	V	24	
3.16.4	Size:	mm	96 x 96	
3.17	Control Relays			
3.17.1	OEM:		Allen-Bradley	
3.17.2	Type: 700S-CF440EJC Safety Control Relays		Yes	
3.17.3	Voltage: 24V DC (Coil)	V	24	
4	ACCESSORIES AND CONSUMABLES			
4.1	Terminals			
4.1.1	OEM:		Weidmuller	
4.1.2	Type: (Spring loaded with link)		WTR 4 SL	
4.1.3	End plate for WTR 4 SL		Yes	
4.1.4	Plug in cross connection: ZQV		Yes	
4.1.5	SIHA fuse holder with no LED compatible for WTR 4 SL terminal		Yes	
4.1.6	Fuse:	mA	100	
4.2	Terminals			

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Item	Description	Units	Schedule A	Schedule B
4.2.1	OEM:		Phoenix Contact	
4.2.2	Type: UK 6-FSI/C, Flat-type fuse terminal block, cross section: 0.2 - 6 mm ² , AWG: 26 - 8, width: 8.2 mm, colour: black	mm ²	0.2 - 6	
4.2.3	Fuse: Automotive holder blade	A	2	
4.3	End Stop			
4.3.1	OEM:		Phoenix Contact	
4.3.2	Type: E/NS 35 N, End clamp, with: 9.5mm, colour: grey		Yes	
4.4	Shielding			
4.4.1	OEM:		Phoenix Contact	
4.4.2	Type: AB/SS-M Support bracket made from insulation material, with retaining screw, can be used for 3 x 10 mm busbar, colour: grey		Yes	
4.4.3	Neutral conductor rail 3 x 10 mm		Yes	
4.4.5	20-10 AWG, Polyamide No-fused Terminal Block		Yes	
4.5	Labelling			
4.5.1	OEM:		Grafoplast Wire Makers	
4.5.2	Type: PVC tags (yellow). Size: 15 and 23mm		Yes	
4.5.3	Type: Sleeves (Clear). Size: 15 and 23mm		Yes	
4.5.4	Self-adhesive PVC Tags (White)		As required	
4.6	Pre-insulated Lugs and Bootlace Ferrules			
4.6.1	OEM:		Hellermann Tyton	
4.6.2	Type: Pre-insulated Ring Lugs (Red). Size: 0.25-1.65mm ² . Product ID: 1R3		Yes	
4.6.3	Type: Pre-insulated Ring Lugs (Blue). Size: 1.04-2.63mm ² . Product ID: 2R35		Yes	
4.6.4	Type: Pre-insulated Hook Blade Lugs (Red). Size: 0.25-1.65mm ² . Product ID: 1HB3		Yes	
4.6.5	Type: Pre-insulated Hook Blade Lugs (Blue). Size: 1.04-2.63mm ² . Product ID: 2HB3		Yes	
4.6.6	Type: Insulated Bootlace Ferrules (Red). Size: 1.00mm ² . Product ID: E1010RD		Yes	
4.6.7	Type: Insulated Bootlace Ferrules (Black). Size: 1.50mm ² . Product ID: E1510BK		Yes	
4.7	Panel Wire			
4.7.1	OEM:		Lapp Cables	
4.7.2	Type: Grey Panel Wire (600/1000V) Size: 1.00mm ²		Yes	
4.7.3	Type: Grey Panel Wire (600/1000V) Size: 1.50mm ²		Yes	

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

Item	Description	Units	Schedule A	Schedule B
4.7.4	Type: Red Panel Wire (600/1000V) Size: 1.50mm ²		Yes	
4.7.5	Type: Black Panel Wire (600/1000V) Size: 1.50mm ²		Yes	
4.8	Terminal Marker			
4.8.1	OEM:		Phoenix Contact	
4.8.2	Type: KLM-A terminal group marker		Yes	
4.9	Panel Trunking			
4.9.1	Material		PVC	
4.9.2	Trunking/Chain type		Slotted Panel Trunking	
4.9.3	Slot type		Open	
4.9.4	Width	mm	80	
4.9.5	Depth: as per design drawings		Yes	
4.9.6	Colour		Grey	
4.10	Din rail			
4.10.1	Material		Steel	
4.10.2	Type		Slotted	
4.10.3	Width	mm	35	
4.10.4	Height	mm	7.5	
4.10.5	Length: as per design drawings		Yes	
5	TEST AND INSPECTION			
5.1	Preparation for FAT		Yes	
5.2	Factory acceptance test		Yes	
6	DOCUMENTATION			
6.1	<i>Supplier</i> provides documentation in electronic media using Microsoft Office and "searchable" PDF format		Yes	
6.2	<i>Supplier</i> uses MicroStation (DGN) or format that is compatible with MicroStation.		Yes	

SHORT SUPPLY CONTRACT ALL PARTS- MANUFACTURING AND SUPPLY OF CONTROL PANELS

APPENDIX B: SPARES

Eskom spares requirements quantity is as follows:

Item:	Description:	Quantity:
1	Quint-PS (Power Supply) 1AC/24DC/20	2
2	Quint-Diode/40 Redundancy Module	2
3	Silicon junction diode, 2-pin T-module	2
4	Isometer Insulation Monitor	2
5	Double Pole MCB	5 of each type
6	Fuse Terminals	1 box
7	Spring Loaded Terminals	2 boxes
8	Terminal Endplate	1 box
9	SIHA fuse holder with no LED compatible for WTR 4 SL	1 box
10	Fuse: 100mA	500
11	Fuse: 2A	100
12	SK 3105.340 Enclosure Heater	1
13	SK Enclosure Internal Thermostat	1
14	Pushbutton	10
15	Lamp Indication	10
16	LED bulb	50
17	Key Type Switch	4
18	Cam Type Switch	4
19	Gauge	1 per range
20	Emergency Push Button	2
21	Control Relay	5