



## KENYA ELECTRICITY GENERATING COMPANY PLC

**KGN-OPS-01-2023**

**RFx: 5000012333**

### **TENDER FOR MACHINING AND FABRICATION OF PARTS FOR KenGen EQUIPMENT. (Framework Contract for Three (3) Years) (Open National)**

**Date: 19<sup>th</sup> April, 2023**

#### **Addendum No. 2**

In accordance with the **Tender for Machining and Fabrication of Parts for KenGen Equipment**, KenGen issues **Addendum No. 2** as follows:

#### **I. REVISED SCHEDULE V (Item No. 26): WESTERN HYDROS POWER STATIONS**

<b>Schedule</b>	<b>No.</b>	<b>Description</b>	<b>UoM</b>	<b>Qty</b>	<b>Unit Price</b>	<b>Total Price</b>
<b>Schedule V: WESTERN HYDROS POWER STATIONS</b>	<b>26</b>	<p><b>TURKWEL THRUST BEARING REMETALLING AND MACHINING</b></p> <p>Remove the old white metal from the cast steel thrust pad ring. The pads are 9 in number as per <b><i>Turkwel Thrust Bearing drawing No. 621128.</i></b></p> <p>Thoroughly clean the bonding surface to remove oil and grease. (Physical and Chemical)</p> <p>The bearing shell shall be free of all foreign substances, such as oil and dirt, prior to any tinning operations. The surfaces shall be provided with tinning coat to ensure a tight bond between the bearing base metal and the new babbitt.</p> <p>Special care shall be taken to protect all holes and surfaces of the shoes/pads not receiving babbitt</p>	pc	1		

Precautions shall be taken to minimize bearing pad ring distortion during babbiting.

Re- metal the Pads using Tin based material of grade 2 having the following chemical properties:

- Tin..... 90.0%
- Antimony...7.0 to 8.0%
- Lead.....0.35% max
- Copper.....3.0 to 4.0%

The material to be applied to be bearing shall be all new (not used) tin based babbit metal complying with ASTM standard specification for white metal bearing Alloys B23, Grade 2

The contractor shall provide a sample of the babbit material and a certificate of analysis of its chemistry from an independent accredited testing laboratory.

The Thickness of the Tin based material layer shall be sufficient to allow machining to the profile indicated in **Turkwel Thrust Bearing drawing No. 621128.**

The lining shall be ultrasonically tested to ensure sound bonding to the pads and shall be free of voids. The babbit material shall be free of cracks, blow holes, and shrink pockets, have a tight bond to the to the bearing pad and be 100% free of surface porosity. If repairs are required in the babbit surface, a repair procedure shall be submitted.

The Contractor shall conduct UT and PT inspections of the bearing babbit bond following the procedures detailed below. The final inspection shall be witnessed by client representative following the completion of all finish machining.

The entire babbit surface of each bearing pad shall be scanned using overlapping scan paths by at least 20% of the effective transducer width. Scanning rates shall not exceed 3 inches per second. Areas over temperature sensor groove or dovetail grooves need not be UT examined.

	<p>All unbonded babitted areas shall be carefully scanned to determine the configuration. The outside edges of all unbonded areas shall be marked on the surface of the babbitt.</p> <p><b>MACHINING AND FINISHING</b></p> <p>Machining to the profile indicated in <b><i>Turkwel Thrust Bearing drawing No. 621128.</i></b></p> <p>Out of tolerance work shall not be accepted.</p> <p>After rebabbing and final machining, the contact area of the babbitt surfaces shall be checked on a certified surface plate. The surface contact shall not be less than 85% on each pad.</p> <p>All unfinished surfaces shall be painted using grey oil resistant paint applied after preparing the surfaces in accordance with paint manufacturers recommendations.</p> <p>The contractor shall package the bearing pad ring for shipment from their premises ensuring that it is protected from damage. KenGen shall arrange transportation from the contractor's premises. The contractor shall arrange means of loading onto KenGen lorry.</p>				

## 2. REVISED Schedule VI: WELLHEADS/OLKARIA COOLING TOWERS GEARBOXES

The gear wheels should be manufacture to the following minimum requirements:

- I. Manufacture All Gear Wheels as per sample/drawing from EN24 Steel Grade, or higher.

Hardened, Tempered and Stress Relieved to OEM properties

No	Description	UOM	UNIT PRICE (Price for 1)	ESTIMATE D ANNUAL CONSUMPTION
I	<p><b>C64 Cooling Tower Gearbox Pinion Gear Shaft</b></p> <p>As per drawing C64 COOLING TOWER GEAR BOX DWG NO. Z148Z25 attached</p>	Pc		10

2	<b>C64 Cooling Tower Gearbox Helical Gear Wheel</b> As per drawing C64 COOLING TOWER GEAR BOX DWG NO. Z148Z64 attached	Pc		10
3	<b>C64 Cooling Tower Gearbox Shank Pinion</b> As per drawing C64 COOLING TOWER GEAR BOX DWG NO. Z148Z24 attached	Pc		10
4	<b>C64 Cooling Tower Gearbox Gear Wheel</b> As per drawing C64 COOLING TOWER GEAR BOX DWG NO. Z148Z41 attached	Pc		10
5	<b>C50 Cooling Tower Gearbox Pinion Shaft Gear</b> As per drawing C50 COOLING TOWER GEAR BOX DWG NO. Z128Z27 attached	Pc		10
6	<b>C50 Cooling Tower Gearbox Helical Gear Wheel</b> As per drawing C50 COOLING TOWER GEAR BOX DWG NO. Z128 attached	Pc		10
7	<b>C50 Cooling Tower Gearbox Shank Pinion</b> As per drawing C50 COOLING TOWER GEAR BOX DWG NO. Z128Z21 attached	Pc		10
8	<b>C50 Cooling Tower Gearbox Gear Wheel</b> As per drawing C50 COOLING TOWER GEAR BOX DWG NO. Z128Z38 attached	Pc		10
14.	2 <sup>nd</sup> Stage, C64 turbine wear ring as per DRAWING NO: WHD/CASING/C64/RING (Drawing is in Document Named C64 Diaphragm Rings 2nd to 5th Stages.pdf)	Pc		2
15.	3 <sup>rd</sup> Stage, C64 turbine wear ring as per DRAWING NO: WHD/CASING/C64/RING (Drawing is in Document Named C64 Diaphragm Rings 2nd to 5th Stages.pdf)	Pc		2
16.	4 <sup>th</sup> Stage, C64 turbine wear ring as per DRAWING NO: WHD/CASING/C64/RING (Drawing is in Document Named C64 Diaphragm Rings 2nd to 5th Stages.pdf)	Pc		2

<b>17.</b>	5 <sup>th</sup> Stage, C64 turbine wear ring as per DRAWING NO: WHD/CASING/C64/RING (Drawing is in Document Named C64 Diaphragm Rings 2nd to 5th Stages.pdf)	Pc		2
<b>18.</b>	6 <sup>th</sup> Stage, C64 turbine wear ring as per DRAWING NO: WHD/C64/TURBINE/6 <sup>TH</sup> STAGE DIAPHRAGM RING (Drawing is in Document Named C64 6th Stage Ring Drawing-Layout I .pdf)	Pc		2
<b>19.</b>	7 <sup>th</sup> Stage, C64 turbine wear ring as per DRAWING NO: WHD/C64/TURBINE/7 <sup>TH</sup> STAGE DIAPHRAGM RING (Drawing is in Document Named C64 7th Stage Ring Drawing-Layout I .pdf)	Pc		2
<b>20.</b>	8 <sup>th</sup> Stage, C64 turbine wear ring as per DRAWING NO: WHD/C64/TURBINE/8 <sup>TH</sup> STAGE DIAPHRAGM RING (Drawing is in Document Named C64 8th Stage Ring Drawing-Layout I .pdf)	Pc		2
<b>21.</b>	2 <sup>nd</sup> Stage, C50 turbine wear ring as per DRAWING NO: C50 2nd Stage Wear Ring.pdf	Pc		5
<b>22.</b>	3 <sup>rd</sup> Stage, C50 turbine wear ring as per DRAWING NO: C50 3rd Stage Wear Ring.pdf	Pc		5
<b>23.</b>	4 <sup>th</sup> Stage, C50 turbine wear ring as per DRAWING NO: C50 4th Stage Wear Ring.pdf	Pc		5
<b>24.</b>	5 <sup>th</sup> Stage, C50 turbine wear ring as per DRAWING NO: C50 5th Stage Wear Ring.pdf	Pc		5
<b>25.</b>	6 <sup>th</sup> Stage, C50 turbine wear ring as per DRAWING NO: C50 6th Stage Wear Ring.pdf	Pc		5
<b>26.</b>	7 <sup>th</sup> Stage, C50 turbine wear ring as per DRAWING NO: C50 7th Stage Wear Ring.pdf	Pc		5

27.	8 <sup>th</sup> Stage, C50 turbine wear ring as per DRAWING NO: C50 8th Stage Wear Ring.pdf	Pc		5
28.	Small Bombas Ideal Stationary Wear Ring as per DRAWING NO: Small Bombas Ideal CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
29.	Small Bombas Ideal Moving Wear Ring as per DRAWING NO: Small Bombas Ideal CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
30.	Big Bombas Ideal Stationary Wear Ring as per DRAWING NO: Big Bombas Ideal CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
31.	Big Bombas Ideal Moving Wear Ring as per DRAWING NO: Big Bombas Ideal CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
32.	Small Flowserve Stationary Wear Ring as per DRAWING NO: Small Flowserve CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
33.	Small Flowserve Moving Wear Ring as per DRAWING NO: Small Flowserve CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
34.	Big Flowserve Stationary Wear Ring as per DRAWING NO: Big Flowserve CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
35.	Big Flowserve Moving Wear Ring as per DRAWING NO: Big Flowserve CAN Pump, Stationary & Moving Wear Rings.pdf	Pc		5
36.	Bombas Ideal Bearing Housing as per DRAWING NO: Bombas Ideal CAN PUMP Bearing Housing	Pc		5
37.	KWG12 Ejector nozzle as per DRAWING NO: KWG12 Ejector Nozzle	Pc		3
38	C64 & C50 Turbine Thrust Pad Holder as per DRAWING NO: C64 & C50 Turbine Thrust Pad Holder.pdf	Pc		3
39	<p><b>Assembly of C64 Cooling Tower Gearbox</b></p> <p>The scope of work required here is provision of services to assemble a geared motor as described below. All bearings, gears and seals will be provided by the client.</p>	AU		1

	<ul style="list-style-type: none"> <li>i. Repair by welding/undercutting and installing a sleeve cast iron motor end covers, to fit bearings sizes 6315ZZ and 6313ZZ.</li> <li>ii. Repair of bearing seats on motor rotor shaft to fit the clearances on bearings 6315ZZ and 6313ZZ.</li> <li>iii. Repair the internal diameter bore diameter of the rotor, and machine to size, to allow interference clearance with pinion shank gear as per drawing C64 COOLING TOWER GEAR BOX DWG NO. Z148Z24 attached.</li> <li>iv. Run and confirm eccentricity tests on the assembled motor.</li> <li>v. Repair bearing seats on the gearbox casing, to allow proper seating of bearings nos. 33210 (2pcs),2215 and 6318.</li> <li>vi. Assemble all gears for C64 Cooling Tower Gearbox as per drawing C64 COOLING TOWER GEAR BOX.</li> </ul>			
<p><b>40</b></p>	<p><b>Assembly of C50 Cooling Tower Gearbox</b></p> <p>The scope of work required here is provision of services to assemble a geared motor as described below. All bearings, gears and seals will be provided by the client.</p> <ul style="list-style-type: none"> <li>vii. Repair by welding/undercutting and installing a sleeve cast iron motor end covers, to fit bearings sizes 6315ZZ and 6313ZZ.</li> <li>viii. Repair of bearing seats on motor rotor shaft to fit the clearances on bearings 6315ZZ and 6313ZZ.</li> <li>ix. Repair the internal diameter bore diameter of the rotor, and machine to size, to allow interference clearance with pinion shank gear as per drawing C50 COOLING TOWER GEAR BOX DWG NO. Z128Z27 attached.</li> <li>x. Run and confirm eccentricity tests on the assembled motor.</li> <li>xi. Repair bearing seats on the gearbox casing, to allow proper seating of</li> </ul>	<p>AU</p>		<p>I</p>

	bearings nos. 32310,32311,2218 and 6320. xii. Assemble all gears for C50 Cooling Tower Gearbox as per drawing C50 COOLING TOWER GEAR BOX.			
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**SUPPLIER ACKNOWLEDGEMENT OF ADDENDUM NO. 2**

We, the undersigned hereby certify that the addendum is an integral part of the document and the alterations set out in addendum has been incorporated in the Tender document.

Signed.....

Tenderer.....

Date.....