

**PN SEZ : CONGO - MRSS (Main Receiving S/Stn) - 2 X 280 MVA Capacity
Construction of New MRSS & Modification Works at an Existing MGK # 2 S/Stn**

LOT # 2

SCOPE OF WORKS

Rev # 0 Date : 28.08.2023

Package # 1	MRSS - Main Receiving Sub-Station	AGENCY	SUGGESTED AGENCIES
	<p>PART # I (A) - MRSS : ELECT. DESIGN & ENGINEERING</p> <p>SCOPE : The Govt. of Republic of CONGO Electricity department has proposed to Erect 220/20KV EHT Sub-Station with 3 x 60MVA Power Transformers inside PN SEZ, to evacuate Power from existing MGK # 2 Sub-Station (at 220 KV Voltage Level) situated at a distance of approx. 14.5 Kms.</p> <p>DESIGN CRITERIA : All equipment shall be designed for operation in tropical humid climate at the required capacity in an ambient air temperature of 32°C maximum for indoor and 35°C maximum for outdoor. The de-rating of all equipment shall be done for the ambient mentioned above. Maximum relative humidity of 100% shall also be taken into consideration for design of equipment. However the maximum temperature and maximum relative humidity may not occur simultaneously.</p> <p>All Electrical equipment and accessories shall be suitable for satisfactory operation with the following system parameters and nominal system Frequency of 50Hz ± 5% and a nominal Voltage variations of ±10%. The combined voltage and frequency variation shall be limited to ±10%.</p> <p>LIVE PARTS CLEARANCES :</p> <p>220 KV side :</p> <p><i>Between phases</i> : 4000 mm <i>Sectional clearance</i> : Designer to Specify <i>Minimum Ground clearance</i> : Designer to Specify <i>Bay width c/c</i> : Designer to Specify <i>BIL</i> : Designer to Specify <i>Wet power frequency withstand</i> : Designer to Specify</p> <p>Note : Designer to Verify & Confirm. Free to alter the data as required.</p> <p>20 KV side :</p> <p><i>Between phases</i> : 1200 mm <i>Sectional clearance</i> : 2750 mm <i>Minimum Ground clearance</i> : 3850 mm</p>	<p>Preferably from India</p> <p align="center">Or</p> <p>Any other International Agency.</p>	<ul style="list-style-type: none"> - Nikentan Consultants, Bangalore - Kalpataru Power, Mumbai - Voltech Engineers, Chennai - SATCON, Kolkata - Any Other International Agency.

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Bay width c/c : 3600 mm

BIL : 125 KVP

Wet power frequency withstand : 50 KVrms

Note : Designer to Verify & Confirm. Free to alter the data as required.

Site Climatic Condition

The climatic conditions pertaining to the plant Site are as indicated below:

Extreme highest temperature : 35°C

Extreme lowest temperature : 22°C

Maximum wind velocity : 39 m/sec

Elevation above mean sea level : below 100 m

The Design & Engineering details shall cover the following aspect of the Project, complete with Schematic Drgs, General Layout Drgs, Ground Levels / Floor Levels, Single Line Drgs, 3 Ph Drgs, General Write up on the Proposed Control & Protection Design Philosophy, applicable Calculations & Assumptions, Applicable Codes & Standards adopted, General Specifications, Particular Specifications, GTPs, GA Drgs of each Equipment, Design Descriptions, Applicable Safety Norms, but not limited to :

- a Galvanized Iron Gantries & Posts for for 220/20 KV Sub Station for Incoming / Outgoing Feeders..
- b 220KV & 20 KV grade Lightning Arrestors for all Incoming / Outgoing Feeders.
- c **220 KV System / Bays for ...**
 - i) 2 X 220KV Bays for Incoming Supply.
 - ii) 2 X 220KV Bays for Outgoing Supply.
 - iii) 3 X 220KV Bays for 3 X 60 MVA Power Transformers. (1 No. 60MVA for Future Use)
 - iv) 1 X 220KV Bay for Bus Coupler.
 - v) 1 X 220KV Bay for Spare/ Future Use.
- d 2 X 220KV Busbars 2000A Rated with Support Gantry Sections, complete with (ASTER) conductors.
- e 220KV Isolators, Circuit Breakers, CVTs, PTs, CTs, LTs etc., suitably rated. [Optionally with HyPact Unit].
- f All necessary Insulators, Clamps, Jumpers and other accessories.
- g **20 KV System / Bays for ...**
 - i) 3 X 20KV Bays for 60MVA Power Transformers
 - ii) Provision for 20KV Cable Connections to expend 20KV Power Supply to 20KV Indoor Sub-Station.
- h 20KV Isolators, Circuit Breakers, CVTs, PTs, CTs, LTs. LAs etc., suitably rated.

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	<p>i) Electrical Control Room as required c/w provision ofr Main Control Room with Control Desk for SCADA/Control & Protection Panels/ Metering Panels/RTU Panels, 20KV MV Switchgear Room, Batt. & Batt .Charger Room, UPS Room, Office Room, LT Room, Wash Rooms, Pantry, Store Room, Mini Conference Room, Seperate Generator Room with Fuel Storage Facility, together with all Amenities like Air Conditioning (HVAC), Water, Electricity, Lighting, Underground Cable Trenches, CCTV Cameras, Fire Alram System etc.,</p> <p>j) 20KV Indoor Sub-Station with ... <i>ij) 2 X 20KV Incomer Switchgear Panels.</i> <i>ii) 1 X 20KV Bus Coupler Switchgear Panel.</i> <i>iii) 8 X 20KV Outgoing Switchgear Panels.</i></p> <p>k) Sub-Station Earth Mat, Earthing installation and Lightning Protection Systems with Over Head Shielding wire.</p> <p>l) Electrical Control & Protection Relay Panels together with SCADA & RTU etc.,</p> <p>m) 2 X 250KVA - 20/0.4KV Station Transformers.</p> <p>n) AC Power Distribution Board with AMF for Auxiliary Power Distribution for various loads in 220/20 KV S/Stn.</p> <p>o) 110V DC Battery Bank, Battery Charger Cubicle with and DC Dist.Board.</p> <p>p) Main Lighting Distribution Board and other Distribution Boards.</p> <p>q) Switchyard Lighting & Control Room Lighting,</p> <p>r) Cable Schedule, Cable Trenches, Cable Tray, Cable Ducts etc.,</p> <p>s) Fibre Optic Cable.</p> <p>t) Fire Alarm & Fire Fighting System.</p> <p>u) Main Gate & Boundary Fence.</p> <p>v) Preparing Complete & Comprehensive Bill of Materials for 220/20KV MRSS.</p> <p>w) Complete Drawings - Both in Hard Copy (5 Sets) & Soft Copy.</p> <p>x) As Built Drawings at the end off the Project.</p> <p>y) Any other Design Information to complete the Project Works.</p>		
	PART # I (B) - MRSS : CIVIL WORKS DESIGN		
a	Sub-Station Levelling.		
b	Detailed calculations for Foundation Designs.		

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- c Details of Criteria, Data and other information used for the design of foundations.
- d RCC/CC foundations for Equipment Structure Foundations, Plinths for Transformers, Circuit Breaker Foundations, Gate pillars etc.,
- e Construction of Cable Ducts including cable ducts crossing Transformer track.
- f Construction of compound wall/Fence and retaining wall as required.
- g Construction of Internal Roads.
- h Spreading of HBG metal.
- k Preparing Complete & Comprehensive Bill of Materials for 220/20KV MRSS.
- l Complete Drawings - Both in Hard Copy (5 Sets) & Soft Copy.
- m As Built Drawings at the end off the Project.
- n Any other Design Information to complete the Project Works.

PART # II (A) - MGK # 2 SUB-STATION : ELECT. DESIGN & ENGINEERING

SCOPE :

The SCOPE requires to design **2 X 220 KV Outgoing Feeder Bays at MGK # 2 Outdoor Sub Station**, with a rated capacity of 2 X 280MVA Power Supply to the newly built 220KV DC Transmission Line via 2 Nos Exit Gantries to connect 220KV Supply to PN SEZ. The MGK # 2 Sub-Station is situated at approx 14.5 Kms away from PN SEZ.

The Design & Engineering details must comply to the EXISTING Control & Protection Philosophy, together with Specifications matching to the existing specifications which are already in place, so as to make the new system compatible to the existing system. It shall also cover the following aspect of the Project, with Design & Engineering complete with Schematic Drgs, General Layout Drgs, Single Line Drgs, 3 Ph Drgs, General Write up on the Proposed Control & Protection Design Philosophy, applicable Calculations & Assumptions, Applicable Codes & Standards, General Specifications, Particular Specifications, GTPs, GA Drgs of each Equipment, Design Descriptions, Applicable Safety Norms :

- a **Total - 2 Bays of 220KV Outgoing Feeders.**

Each 220KV Bay shall Consist of :

- i) 2 X 220 KV - 2000A / 31.5kA 1 Sec Disconnecting Isolators
- ii) 1 X 220 KV - 2000A / 31.5kA 1 Sec Disconnecting Isolators + E/Sw.
- iii) 1 X 220 KV - 3150 A /40kA 3 Sec / Circuit Breaker.

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- iv) 3 X 220 KV - CTs of 400/800/1600/1 A 20VA, 5P10.
- v) 3 X 220 KV - PTs of 220KV / 2*100/v3)V
- vi) 3 X 165 KV - LTs of 1250A, 0.2mA, 25kA 1s.
- vii) 3 X 165 KV - LAs of 10kA.

- b All necessary Conductor, Insulators, Clamps, Jumpers and other accessories.
- c Control & Protection Panels.
- d RTU Panel As required.
- e LV Cabling
- f Fibre Optic Cabling
- g Cable Schedule, Cable Trenches, Cable Tray, Cable Ducts etc.,
- h Fibre Optic Cable.
- i Preparing Complete & Comprehensive Bill of Materials for 2 X 220 KV Bays in MGK # 2 Sub-Station.
- j Complete Drawings - Both in Hard Copy (5 Sets) & Soft Copy.
- k As Built Drawings at the end off the Project.
- l Any other Design Information to complete the Project Works.

NOTE : Pl refer to the MGK#2 Sub Station Drgs provided with this RFQ.

PART # II (B) - MGK # 2 SUB-STATION : CIVIL WORKS DESIGN

- a Detailed calculations for Foundation Designs.
- b Details of Criteria, Data and Other information used for the design of foundations.
- c RCC/CC foundations for Equipment Structure Foundations, Circuit Breaker Foundations, etc.,
- d Construction of Cable Ducts including cable ducts crossing Transformer track if any.
- e Preparing Complete & Comprehensive Bill of Materials for 2 X 220KV Bays Construction.
- f Complete Drawings - Both in Hard Copy (5 Sets) & Soft Copy.
- g As Built Drawings at the end off the Project.
- h Any other Design Information to complete the Project Works.

NOTE : Pl refer to the MGK#2 Sub Station Drgs provided with this RFQ.

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Package # 2	GEO TECHNICAL SURVEY FOR MRSS	AGENCY	SUGGESTED AGENCIES
	PART # I - GEO TECHNICAL SURVEY in MRSS inside PN SEZ	(Local)	(Local)
a	Make exploratory borings by means of exploration wells as required.		
b	Complete Dynamic Penetrometric Tests, Local Density Measurements, Soil Samples for Grain Size Analysis; Soil Identification and Classification and Water Sample for Analysis of Corrosiveness.		
c	Earth resistivity measurements shall conform to the Four Point Method		
	PART # II - GEO TECHNICAL SURVEY in MGK#2 Sub-Station		
a	Make exploratory borings by means of exploration wells as required.		
b	Complete Dynamic Penetrometric Tests, Local Density Measurements, Soil Samples for Grain Size Analysis; Soil Identification and Classification and Water Sample for Analysis of Corrosiveness.		
c	Earth resistivity measurements shall conform to the Four Point Method		
Package # 3	SUPPLY OF 220/20 KV SUB STATION MATERIALS	AGENCY	SUGGESTED AGENCIES
	PART # I - MRSS : SUPPLY OF ALL ELECT. ITEMS AS PER BOM.	(Preferably from India)	- Kalpataru Power, Mumbai - KEC , Mumbai
	All as per "APPROVED BOM/BOQ" (Prepared by Design & Engineering Agency)		
a	Supply of Materials, all as per the BOM prepared by the 220/20 KV MRSS, under Package # 1 Part # I(A) work Item # v.		
	PART # II - MGK # 2 : SUPPLY OF ALL ELECT. ITEMS AS PER BOM.		
	All as per "APPROVED BOM/BOQ" (Prepared by Design & Engineering Agency)		
a	Supply of Materials, all as per the BOM prepared by the designer of 220 KV MGK#2 Sub-Station, under Package # 1 Part # II (B) work Item # o.		

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Package # 4	CONSTRUCTION OF 220/20 KV - 2 X 280MVA MRSS	AGENCY	SUGGESTED AGENCIES
	PART # I - MRSS : INSTALL, TEST & COMMISSION	(Preferably from India)	- Kalpataru Power, Mumbai - KEC , Mumbai
	All as per " APPROVED CONSTRUCTION DRAWINGS & BOM/BOQ " (Prepared by Design & Engineering Agency).		
a	Construction of 220/20 KV MRSS as per Specifications & Drgs, incl Taking Delivery of materials from SEZ Stores, Transport, Install, Test & Commission.		
	PART # II - MGK # 2 SUB STATION : INSTALL, TEST & COMMISSION OF 2 X 220KV BAYS		
	All as per " APPROVED CONSTRUCTION DRAWINGS & BOM/BOQ " (Prepared by Design & Engineering Agency).		
a	Construction of 2 X Outgoing 220KV Bays in MGK # 2 Sub Station as per Specifications & Drgs, incl Taking Delivery of materials from SEZ Stores, Transport, Install, Test & Commission.		
IMPORTANT NOTES :			
<ol style="list-style-type: none"> 1 Central Procurement Team can start Pre-Qualifying Vendors / Agencies / Contractors for each Package. 2 Power Source of 400 MW @ 220KV Supply from MGK-2 must be Confirmed / Established, before commencement of T/Line Survey. 3 SEZ must avail a Principle approval from Govt / MGK#2 Sub-Station about the 2 SPARE BAYS currently available in MGK#2 Sub-station, can be spared / used for PN SEZ 220KV DC T/Line. 4 MRSS Ground Levelling Activities may commence together Geo-Technical Investigation. 			