



10th August 2017

TENDER FOR RELOCATION OF ONE GE FRAME 6 GAS TURBINE FROM EMBAKASI IN NAIROBI TO MUHORONI NEAR KISUMU: KGN-GT-012-2017

KenGen wishes to make the following clarification and additions through Addendum 5,

EXTENSION OF THE TENDER OPENING DATE:

We wish to notify you that the tender opening date has been extended from 17th August 2017 at 10.00AM to **24th August 2017 at 10.00AM.**

ITEM 1: ADDITIONAL INFORMATION REGARDING GT GENERATOR, EXCITATION SYSTEM AND SYNCHRONIZING REQUIREMENTS

		DATA/INFORMATION
GENERATOR DATA	Rated Power (MVA)	40.562
	Rated Frequency (HZ)	50
	Rated Voltage (kV)	11.0
	Rated Stator Current (A)	2058
	Power Factor	0.8
EXCITATION FIELD DATA (DATA FOR THE FIELD OF THE AC MAIN EXCITER)	Field Current at No-Load (ADC)	1.54
	Field Current at Full-Load (ADC)	5.5
	Field Voltage at No-Load (VDC)	26.56
	Field Voltage at Full-Load (VDC)	38.0
GENERATOR EXCITATION FIELD DATA (FIELD OF THE MAIN GENERATOR)	Field Current at Full-Load (ADC)	850
	Field Voltage at Full-Load (VDC)	140
FORCING RATIO	Excitation Field Forcing Ratio	1.6
POWER SUPPLY	Excitation Power Transformer	Shunt system from the Generator Terminals. Excitation Transformer System already existing hence out of scope of supply of this tender
	Permanent Magnet Generator (PMG)	Not applicable
CT & PT RATIO FOR SENSING CIRCUIT	VT RATIO	11000/110V
	CT RATIO	3000/1A
	VT BURDEN	50VA
	CT CLASS & BURDEN	5P20
POWER SOURCE AVAILABLE ON SITE	Field Flashing Power Supply (VDC)	110
THYRISTOR FIRING	Firing Card Option	Digital
EXCITATION SYSTEM ENCLOSURE	Excitation Panel	Complete panel providing a complete solution consisting of controller, thyristor bridges and all the necessary controls and accessories to avail DC excitation power to the exciter field. Panel to be so dimensioned as to accommodate all the components and facilitate maintenance.

		Tentative panel details to be a minimum of 2m by 1m by 1m. Finer panel design details to be agreed design meeting with the winning tenderer. The system to be suitable for average temperature of 35Degrees Centigrade and IP54. Ambient temperature to range from 20deg to 50deg Centigrade.	
REDUNDANCY	Power Bridge	YES. Redundancy and automatic transfer to backup bridge in the event of fault of active bridge to be provided	
	Controller	YES. Redundancy and seamless hot standby control facility to be provided. The HMI shall be equipped with a touch screen. Any PLC is admissible so long as it fulfils the minimum performance requirements	
PROTECTION	Generator Protection	Not applicable except rotor earth fault protection and excitation system or excitation transformer over-current. Details of rotor earth-fault and excitation transformer overcurrent to be discussed during design meeting with the winning tenderer. Generator protection already available and therefore outside scope of this tender	
	Transfer Master/Back Up AVR	To be provided	
	AVR Watchdog	To be provided and set to trigger automatic changeover to backup channel	
	Main Step Up Power Transformer	Not applicable. Transformer Protection not within the scope of this tender	
	Overall Generator and Transformer Differential Protection	Not applicable. It is outside scope of this tender	
	Excitation Transformer Protection	HV Fuse (Already existing)	
		LV Overcurrent Protection to be provided. Current transformer to feed the protection already existing	
		Rotor Earth Protection to be provided	
BOOST CIRCUIT	Short Circuit Boost CTs	Not applicable	
DE-EXCITATION CIRCUIT	Fast De-Excitation Circuit	Crow-Bar with DC Field Contactor and Linear Discharge Resistor	
POWER SYSTEM STABILIZER	PSS Requirement	Yes, PSS to be provided and duly commissioned and basis of calculations shared	
SYNCHRONIZING	Manual Synchronizing Requirement	A synchronizing panel consisting of a Manual Synchronizing system, Automatic Synchronizing system complete with an independent Synchronizing Check equipment to be provided. The complete synchronizing panel to be equipped with selector switches to enable choice of manual or automatic synchronizing, Raise/lower commands for both AVR and Governor and ON-OFF controls for the synchronizing circuit breaker. Both the Turbine and Excitation systems shall be able to accept commands directly from the auto-synchronizer to facilitate the automatic	
	Automatic Synchronizing Requirement		
	Synchronizing Check Requirement		

		synchronization. The synchronizing panel shall also be equipped with minimum metering capable of analogue display active power, reactive power, power factor, apparent power, generator phase/line voltage, generator phase current, excitation voltage, excitation current. It shall equally be provided with a multi-functional digital meter able to capture all the measured values above except the excitation voltage and excitation current
FACTORY TRAINING	New Excitation Control System	5-day training for five KenGen staff at the manufacturer's factory shall be provided. Training program and content shall be reviewed and approved by KenGen one-month prior to training
	New Turbine Control System	5-day training for five KenGen staff at the manufacturer's factory shall be provided. Training program and content shall be reviewed and approved by KenGen one-month prior to training
SITE TRAINING	New Excitation System	5-day on-site training for ten KenGen staff shall be conducted following commissioning. The training program and content shall be reviewed and approved by KenGen one month in advance of the commencement of the training
	New Turbine Control System	5-day on-site training for ten KenGen staff shall be conducted following commissioning. The training program and content shall be reviewed and approved by KenGen one month in advance of the commencement of the training
FACTORY ACCEPTANCE TESTING	New Excitation Control System	The 3-day factory acceptance testing of the new excitation system shall immediately follow the 5-day factory training
	New Turbine Control System	The 5-day factory acceptance testing of the new Turbine Control system shall immediately follow the 5-day factory training

ITEM 2: CLARIFICATION OF KENGEN POSITION REGARDING REPLACEMENT OF THE GENERATOR ROTOR, EXHAUST STACK, AIR INLET, BATTERIES, UPS AND BATTERY CHARGERS

Please note that the scope of the tender does not include replacement of the Generator Rotor, Exhaust Stack, Air Inlet, Batteries, UPS and Battery Chargers. The existing equipment are in good condition and they will therefore not be replaced.

**ITEM 3: Factory and Site Training for the New Excitation and Turbine Control Systems
RELOCATED TANK**

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3.19	Factory Training on New Excitation System for Five Engineers for 5 Days (Price exclusive of Accommodation and Air Fares)				
3.20	Site Training on New Excitation System for ten Engineers for 5 Days				
3.21	Factory Training on New Turbine Control System for Five Engineers for 5 Days (Price exclusive of Accommodation and Air Fares)				
3.22	Site Training on New Turbine Control System for ten Engineers for 5 Days				
3.23	3-Day Factory Acceptance Testing for New Excitation System				
3.24	5-Day Factory Acceptance Testing for New Turbine Control System				
TOTAL COST TRANSFERRED TO PRICE SCHEDULE 3 FOR SERVICES					

ITEM 4: SYNCHRONIZING AND METERING/MONITORING PANEL

ITEM	DESCRIPTION	UNI	QUANTITY	RATE	AMOUNT
2.18	Manual Synchronizing System				
2.19	Automatic Synchronizing Equipment				
2.20	Synchronizing Check Equipment				
2.21	Metering Equipment				
2.22	Complete Panel Assembly comprising individual monitoring/metering equipment, synchronizing facilities, wiring and necessary accessories for				
TOTAL FOR ITEMS 2.18 TO 2.22 TO BE TRANSFERRED TO PRICE SCHEDULE 2 (SYNCHRONIZING & METERING PANEL)					

ITEM 5: 11KV INSTRUMENT TRANSFORMER AND CONTROL CABLING

The CT ratio of the 3-core 11KV Instrument Transformer for Protection and Metering shall be 3000/1A and not 2500/1A. This 3-core Instrument Transformer is captured in drawing labelled Fig. 1 “**Single-Line Drawing Illustrating Position of the New Tariff Metering and Protection Current Transformer**”. It is reflected under the larger section 5 titled “**NEW ELECTRICAL CONTROL SYSTEMS**” sub-section (e) titled “**11KV INSTRUMENT TRANSFORMERS AND CONTROL CABLING**”

ACKNOWLEDGEMENT OF ADDENDUM 5

We/I, the undersigned hereby certify that the addendum is an integral part of the document and the alterations set out in the Addendum have been incorporated in the tender proposal.

Signed.....

Tenderer.....