

KGN-HYD - 020-2017.: INTERNATIONAL TENDER FOR REHABILITATION OF EXCITATION, GENERATOR MV SWITCHGEAR, LV SWITCHBOARDS AND PROTECTION SYSTEMS OF GITARU HYDRO POWER STATION -KENYA Clarification 1

Item No.	TENDER CLAUSE NO.	TENDER ARTICLE	Question/additional information sought by tenderers.	Clarification
VOL 1: BIDDING REQUIREMENTS AND PROCEDURES				
1	ITT 35	Negotiations	Please clarify evaluation for eligible, compliant and response tender. Is it only the lowest bidder or also technical point and deliverable are evaluated?	Negotiations shall be undertaken with the lowest evaluated bidder as per tender requirements see TDS 60 page 59-60. Items of negotiation are as detailed in the tender clause.
2	ITT 30.1 & SECTION IV	Technical evaluation criteria	Please clarify the “weight” assigned to: technical and commercial proposal and how such a score will be assigned. (points/percentage of importance)	Technical evaluation shall be on pass or fail basis no grading
3	ITT 37.1	ITT Clause 37.1: The Procuring Entity reserves the right at the time of contract award to increase or decrease the quantity of goods or related services originally specified in these Tendering documents (schedule of requirements) provided this does not exceed by the percentage indicated in the Tender Data Sheet, without any change in unit price or other terms and conditions of the Tender and Tendering documents.	Please clarify the meaning and define field of application	The employer may reduce quantities of items or remove some items listed in the price schedule as long as this does not exceed the stated percentage. This shall be applied to all responsive bidders. Bidders MUST submit their price schedules strictly as given in the tender document. Bids with a different price schedule shall be rejected.
4	ITT 40.1	The amount of Performance Security shall be ten (10) percent of the Contract price. Only bank guarantee will be acceptable.	bid bond we found the clauses stated below. Is there any limit as xxx million bank reference letters, %10 of total price etc	10 percent of contract price as per tender requirements
5	conditions of contract Sub-Clause 14.7	Sub-Clause 14.7 Taxes & Payment	Please clarify if Payment schedule will be subjected to commercial negotiation during bidding final stage	Payment milestones as stated in sub clause 14.7 terms of payment item 6, shall not be subject to negotiations

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6	SECTION VIII: PRICE SCHEDULES	Price schedules	Please clarify if Withholding Tax will be applied especially on Engineering, Training and FAT activities executed outside Kenya	Yes, withholding tax will be imposed on the activities carried out of Kenya as this is deemed as income derived from Kenya. The Income Tax Act provides that on payment for these services to a resident or a non-resident person, tax is withheld on the invoiced amount at the applicable tax rate. All taxes shall be applied as per Kenyan laws. The contractor shall acquaint himself with all necessary tax laws.
6	SECTION VIII: PRICE SCHEDULES	Price schedules	Kindly provide the editable format of price Schedule and GTP	Only the pdf can be provided.

VOL 2: EMPLOYER'S REQUIREMENTS /SPECIFICATIONS

7	1.4.1.3 (k)	Block diagrams showing all inputs and outputs (digital, analogue & serial) for: (i) each type of numerical protection relay, (ii) regulator D-AVR, (iii) converter controller, (iv) Synchronising relay, (v) each type of panel multifunctional meter, (vi) each type of panel indication meters, (vii) Digital power transducer (viii) Each type of Ethernet switch (ix) PTP grand master clock/time server (x) Automatic transfer controller, (xi) Each type of MCCB/ACB ETU, (xii) Remote IO/PLC if offered, (xiii) serial device server and	It is not feasible to provide a block diagram showing all the inputs and outputs during the bidding stage since the design of the system shall not have been done	The employer expects the bidder to submit block diagrams of equipment the bidder proposes to use. The block diagram shall show all the inputs and outputs as given by the manufacturer and not how they shall be configured for the project. Below see a sample block diagram of a numerical relay showing all inputs and outputs
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		(xiv) any other IED's offered. This shall be separate from the manuals i.e. a separate block diagram for each type of device above offered, DO NOT QUOTE the manuals		
8	1.7.3.6	All client's drawings of power plant systems (not forming part of scope of this project) interfaced to the new excitation, protection, metering, SCADA interface and switchgear systems shall be reviewed and updated by the contractor. The client shall provide pen-marked drawings to the contractor who shall provide revised drawings in similar fashion to the drawings of systems supplied by the contractor	Please confirm that Supplier scope can be limited to pen mark up ("red marked") of the existing documentation of plant equipment interfacing with new supply Are the client drawings to be reviewed available in AutoCAD	All drawings shall be reviewed and updated as elaborated in the aforementioned clause of the tender. Contractor shall provide soft and hardcopy of all these drawings as detailed in clause 1.7 of specifications Employer's drawings are only available in hardcopy
9	1.10.2	Erection, and installation supervision	Where is there alternative access to the powerhouse other than the lift? – for delivery of materials	There is motorable tunnel to the power house which is approximately 6m wide and 10m tall, it is used to deliver materials and personnel to the power house. During installation work only the tunnel shall be used by the contractor personnel, contractor shall provide means of transporting their personnel to the powerhouse as the lift is normally used by plant operators only.
10	1.10.2.18(c)	During LV switch board installation, the Contractor shall as far as possible erect and connect the	During site visit we received the comment to install LV equipment in the same position of the existing one, re-	Due to space and time constraints all cables to the LV switch boards shall be replaced

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		new cabinets temporarily adjacent to the one in operation. A quick disconnection and removal of the old cabinets can then be performed and the new cabinets pulled in with most of its cables already fitted.	using existing power cables as much as possible. The activity should be done during general shutdown for critical switchboards. Please clarify the difference between what we received as instruction during survey, and this requirement of tender	see addendum 3
11	1.10.2.18 (d)	During total station outage, temporary supplies shall be necessary, contractor shall install temporarily power distribution boards/cabinets to supply critical loads. Contractor shall provide correctly rated mobile diesel generator	Please indicate the essential loads to be supplied during outages, and clarify their size, where they are installed, and from which board they are supplied. This will allow to well estimating the temporary supply system.	List of critical loads to be supplied during station outage as per addendum 3 see addendum 3
12	1.10.2.18 (d)	During total station outage, temporary supplies shall be necessary, contractor shall install temporarily power distribution boards/cabinets to supply critical loads. Contractor shall provide correctly rated mobile diesel generator	Please clarify who will supply the diesel fuel.	Contractor shall supply correctly rated mobile diesel generator with all necessary essentials including DG fuel.
13	1.10.3.14	Client shall also handover pen marked modified drawings of power plant systems (not forming part of scope of this project) interfaced to the new installed systems to be updated by the contractor. The client shall provide pen marked drawings to the contractor who shall provide revised drawings in similar fashion to the drawings	Please confirm that Supplier scope can be limited to pen mark up (“red marked”) of the existing documentation of plant equipment interfacing with new supply Are the client drawings to be reviewed available in AutoCAD	All drawings shall be reviewed and updated as elaborated in the aforementioned clauses of the tender. Contractor shall provide soft and hardcopy of all these drawings as detailed in clause 1.7 of specifications Employer's drawings are only available in hardcopy

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		of systems supplied by the contractor.		
14	1.10.5	Accommodation of Contractor's Personnel	Are there medical Centres nearby?	There is a dispensary/clinic at kivaa town centre 10 km away, Major hospitals are located in Embu town 50km away.
15	1.10.5	Accommodation of Contractor's Personnel	What are the meal arrangements during the work?	see clause 1.10.5.1
16	1.10.5	Accommodation of Contractor's Personnel	What are the available accommodation options available (during the works)?	see clause 1.10.5.1
17	1.13.2.4 (d)	One (1) Three Phase Motorised Variable Transformers (Variac) for testing purposes with the following features: (iv) Surge current rating:1500A for 1sec	what do you mean by surge current rating	short circuit current withstand rating i.e. the maximum current the transformer can withstand without suffering any irreversible damage if a short circuit was to occur during its use.
18	2.3.1.1	Contractor shall manufacture, test, supply, install and commission two (2) (one for each unit) Static Excitation Systems, designed and sized for a generator rated 100MVA@15KV power rating (The existing generator is 85MVA but may be upgraded to 100MVA), the rated excitation output shall however at minimum meet the following (a) Rated excitation output voltage: 230V (b) Rated excitation output current: 1500A (c) Rated excitation output power: 345KVA (d) Maximum excitation Output Voltage- Ceiling voltage: $\pm 400V$,	Please provide the rated value data of the generator powered/upgraded to 100MVA The proposed thy converter will exceed the performance required (2400A x 30sec, 3600 A per 20 sec. and 2000A continuous at 45°C). Note Not knowing the “new rated field data bidder cannot guarantee to meet the new requirement. Moreover the existing excitation transformer will not able to withstand the performance required to the new excitation system: the new transformer	The data is not available as this is upgrade is just a proposal, however the minimum power rating requirements that MUST be met by the new excitation system have already been given in clause 5.3.1.2 and 5.3.2.2. The existing excitation transformers shall be re used. The new excitation system shall be of higher rating than the excitation transformer. The regulators and converters shall be configured to limit excitation power output to within the excitation transformer rating which is suitable for the current generator.

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		continuous (e) Maximum excitation Output Current - Ceiling Current: 2400 A, for 30 sec Detailed requirements as per particular specification	data shall be 710 KVA – 15/0,34 KV.	
19	2.3.1.1	Contractor shall manufacture, test, supply, install and commission two (2) (one for each unit) Static Excitation Systems, designed and sized for a generator rated 100MVA@15KV power rating (The existing generator is 85MVA but may be upgraded to 100MVA), the rated excitation output shall however at minimum meet the following (a) Rated excitation output voltage: 230V (b) Rated excitation output current: 1500A (c) Rated excitation output power: 345KVA (d) Maximum excitation Output Voltage- Ceiling voltage: $\pm 400V$, continuous (e) Maximum excitation Output Current - Ceiling Current: 2400 A, for 30 sec Detailed requirements as per particular specification	2) Thyristor Power Transformer Rating Calculated according to data given on Vol II: Technical Specification, Chapter 2.3 Excitation System Scope of Supply, 2.3.1.2, Page 65 of 491: Maximum continuous excitation voltage (Rated excitation output voltage + 10%) 253 V Maximum continuous excitation current (Rated excitation output current + 10%) 1650 A Given on Drawing No GIT-SPEC-GEN-01-17 : Basic rating continuous excitation voltage 485 V Basic rating continuous excitation current 2000 A Kindly Clarify the data difference	Minimum power rating requirements that MUST be met by the new excitation system have already been given in clause 5.3.1.2 and 5.3.2.2. The thyristor power converter shall be of higher rating than the minimum overall excitation output requirement. NB Detailed technical specifications are given in the particular technical specifications clauses, the employer requirements illustration drawing (vol IV) is meant to illustrate the basic requirements. The scope of works clause 2 is intended to provide the overall scope of supply but not the detailed technical specifications of the required equipment.
20	2.3.1.2	Contractor shall manufacture, test, supply, install and commission A minimum of 5(five) panels for each unit	The existing excitation system panel whole width is 3300mm, our panel whole width is 3800mm, so 600mm more width space is required. Please confirm a 600mm more width space can be expanded	A maximum of 800mm is available to the left of the existing SR1 panel. The maximum available length for the new excitation panels is 4100mm.

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			for excitation panel at site.	
21	2.3.1.4	The excitation system shall be interfaced to all the required systems, new cabling rated as per IEC standards and as per technical specifications shall be done.....	As DC power cable from the output of excitation system to rotor is under the scope of supply, please confirm the distance	The exact cable length is not available however estimated distances between equipment has been provided. See addendum 3
22	2.3.1.4	The excitation system shall be interfaced to all the required systems, new cabling rated as per IEC standards and as per technical specifications shall be done.....	Existing excitation transformer, cables and accessories will be used or not	All excitation cables to be replaced as detailed in clause 2.3.1.4 Existing excitation transformer to be used.
23	2.3.1.6	The existing excitation transformer shall be re-used and is not in the scope of supply. If the bidder is in the opinion the excitation transformers require replacements, they can raise a clarification request.	The existing excitation transformer is 470KVA, 15kV/240V However, according to our calculation, When the generator voltage is down to 80%Ugn, the excitation system shall output 1.8 times of rated field voltage and current. The excitation transformer shall be about 1100kVA, 15kV/430V.Pls confirm whether the excitation transformer will be replaced this time.	The existing excitation transformers shall be re used. The new excitation system shall be of higher rating than the excitation transformer. The regulators and converters shall be configured to limit excitation power output to within the excitation transformer rating.

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24	2.3.1.6	<p>The existing excitation transformer shall be re-used and is not in the scope of supply. If the bidder is in the opinion the excitation transformers require replacements, they can raise a clarification request.</p>	<p>As calculated the Static Excitation parameters according to data given on Vol II: Technical Specification, Chapter 2.3 Excitation System Scope of Supply, 2.3.1.2, Page 65 of 491 and compare with data given on Drawing No GIT-SPEC-GEN-01-17 there are the following peculiar items :</p> <p>1) Excitation Transformer Rating Excitation Transformer Rating calculated according to data given on Vol II: Technical Specification, Chapter 2.3 Excitation System Scope of Supply, 2.3.1.2, Page 65 of 491: Minimal rated power 812 kVA 15kV / 330V</p> <p>Excitation Transformer Data given on Drawing No GIT-SPEC-GEN-01-17 : 417 kVA 15kV / 240V</p> <p>If the above data are for existing Excitation Transformer , this Transformer does not suit to required Data.</p> <p>Kindly Advise</p>	<p>The existing excitation transformers shall be re used. The new excitation system shall be of higher rating than the excitation transformer. The regulators and converters shall be configured to limit excitation power output to within the excitation transformer rating which is suitable for the current generator.</p> <p>NB excitation system power rating requirements are given in clause 5.3.1.2 and 5.3.2.2.</p>

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25	2.3.2 (a)	<p>(a) 2(two) digital automatic voltage regulation(D-AVR) PLC with 1+1 redundancy i.e. all features and functions 100% redundant. The regulators shall have all the necessary modules and devices to carry out excitation control functions, as a minimum, EACH regulator shall have the following:</p> <ul style="list-style-type: none"> (i) Processor-CPU module (ii) Digital input modules for at least ninety-six (96) digital inputs (iii) Digital output modules for at least thirty (32) digital outputs (iv) Analogue input modules for at least eight (8) RTD inputs and four (4) 4-20mA analogue inputs (v) Stator current & voltage measurement module/s (vi) Two (2) Ethernet Communication modules each with at least two (2) fast Ethernet ports 	<p>can we have redundancy to only the I/O fundamental to keep the unit running in case of a fault in I/O card. The No. of I/O will be the result of the necessary interface with the rest of the power plant devices.</p>	<p>As per tender requirements. See clauses 5.3.4 and 2.3.2</p>
26	2.3.6.1	<p>The following temperature monitoring devices shall be supplied and installed in the existing excitation transformer cubicle</p> <ul style="list-style-type: none"> (a) Twelve (12) Resistance temperature detectors (RTD's) (b) At least two (2) thermo-switches each with two settable SPDT 	<p>Please confirm if it is possible to offer digital Thermal relay connected to RTD of 3 windings and core, instead of mechanical thermo-switches</p>	<p>as per tender requirements</p>

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		contacts for alarm and trip		
27	2.3.6.2	The following HV instrument transformers shall be supplied and installed in the existing excitation transformer cubicle.....	As there is already a CT at the HV side of the excitation transformer, why is one more CT required for over current protection.	As per tender requirements.
28	2.3.7.1	Contractor shall manufacture, test, supply, install and commission 2 (two) (one for each unit) Shaft Brush gear with all associated devices for generator shaft earthing and rotor earth fault sensing.	Please confirm only n° 2 units must be included in the offer	for unit 2 and 3 only, two units as stated in the requirements
29	2.3.7.1	Contractor shall manufacture, test, supply, install and commission 2 (two) (one for each unit) Shaft Brush gear with all associated devices for generator shaft earthing and rotor earth fault sensing.	Please confirm the statement is about rotor earth fault (no shaft current protection needed)	shaft current protection is a requirement see clause 7.3.2.3
30	2.3.7.1	Contractor shall manufacture, test, supply, install and commission 2 (two) (one for each unit) Shaft Brush gear with all associated devices for generator shaft earthing and rotor earth fault sensing.	As generator shaft over current protection shall be supplied, confirm whether primary shaft CT is already existing at site. If yes, please share us the necessary technical schedule, such as CT ratio, etc.	Generator shaft earthing system is not existing, CT's and all other equipment and accessories necessary for shaft earthing and shaft over current protection shall be provided and installed by the contractor. See addendum 3

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31	2.4.1.1	<p>Contractor shall manufacture, test, supply, install and commission three (3) (one for each unit) indoor type Medium Voltage Generator switchgear systems each rated as follows</p> <p>(a) Rated voltage: 17.5 kV (b) Rated frequency: 50 Hz (c) Rated power-frequency withstand voltage 50kV,1minute (d) Rated lightning impulse withstand voltage 110 KV, 1.2/50 μs (e) Rated short-time withstand current 63kA (f) Rated duration of short circuit 3s (g) Rated peak withstand current 173kA (h) Rated continuous current of bus bar @40°C 4300A (i) Rated current of bus bar with forced cooling \geq5000A (j) Rated continuous current rating of Generator CB @40°C 5000A Detailed requirements as per particular specifications</p>	<p>Despite of requirement ($I \geq 5000$ A with forced cooling), we noticed that no forced cooling system is required for MV switchgear. Please clarify.</p>	<p>Requirement is given in clause 6.4.1.3(f) "Each cubicle shall be equipped with at least two ventilation cooling fans"</p>
32	2.4.1.1	<p>Contractor shall manufacture, test, supply, install and commission three (3) (one for each unit) indoor type Medium Voltage Generator switchgear systems</p>	<p>Please confirm that a single dedicated generator circuit breaker instead of a switchgear is an acceptable solution</p>	<p>complete MV switchgear as per tender requirements</p>
33	2.4.2	<p><u>Generator Circuit breaker (GCB) cubicle</u> Each panel shall contain</p>	<p>Please confirm that a gas SF6 insulated breaker (GCB) with the same</p>	<p>vacuum as per tender requirements</p>

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		all the components and devices required to fulfil the requirements given in the particular specification, a minimum of the following equipment shall be included in each panel: (a) One (1) vacuum generator circuit breaker	electrical features can be accepted	
34	2.5	Protection system scope of supply	Protection relay STX Prot in our scope or not..... Please Advise	The three station transformers protection system is in the scope See clause 2.5.1.1 for protection systems scope of supply.
35	2.5	Protection system scope of supply	Only the Generator protection will be replaced or entire protection including transformer protection, block differential etc.? Please clarify	All electrical protection systems for unit 2 and 3 to be replaced, see clause 2.5 for scope of supply and employer's requirements illustration drawings for requirements overview
36	2.5	Protection system scope of supply	The protection upgrade will be for unit 2 & 3 only. Unit 1 will be out of our scopePlease confirm	See clause 2.5.1.1 for protection systems scope of supply.
37	2.5.2.1 (a)	2 (two) Generator numerical protection relays each from a different manufacturer	Please confirm numerical protection of the same manufacturer is acceptable	as per tender requirements see clause 7.3.2.5, 2.5.2.1 & 2.5.2.8
38	2.5.5.1(b)	At least 7 (seven) remote IO/merging units with mounting accessories and outdoor mounting cabinets where necessary (optional dependent on wiring configuration chosen by the bidder as per particular specifications)	How many Remote IO/Merging units required and where it will be installed?	Use of remote IO/merging units is optional and may be used for digital inputs & outputs for which hard wiring is not mandatory to reduce amount of wiring especially to GSU transformers and 132kV CB's. Merging units for CT and VT inputs can be provided as back up but hardwiring is mandatory for all VT and CT inputs. Clauses 7.3.2.6 (i), 7.3.3.6(i), 7.3.4.5(h) & 7.3.6.4(g) gives details on how and where remote IO/merging units may be used.

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39	2.5.8 (3)	2(two) Station transformer & EDG numerical protection relays	Please clarify if we shall supply n. 1 station transformers relays + n. 1 EDG relays OR n. 2 station transformers relays + n. 2 EDG relays	The expectation is that EDG, station transformers and alternative supply transformer protection IED's shall be the same type, however if they are different, one relay of each type shall be provided as spares If they are the same type then two similar relays shall be given as spares. See addendum 3
40	2.6	LV switchboards scope of supply	For LV distribution boards, all boards of PP will be replaced or not? If no please clarify the units that need replacement.	Scope of supply for the switchboards is given in clause 2.6
41	3.6	Switchboards, panels and cabinets requirements	Please provide, if available, general plant layout dwg, if available, in order to be able to evaluate equipment installation and provide dimensioned equipment layout positioning	All the available layout drawings were provided during site visit. Bidders who attended the two mandatory site visits are free to visit the site for further data collection/site familiarisation
42	3.6	Switchboards, panels and cabinets requirements	Please we need Gitaru Plan layout showing the Equipment locations and cable routing (lengths) drawings	All the available layout drawings were provided during site visit. Bidders who attended the two mandatory site visits are free to visit the site for further data collection/site familiarisation Detailed cable list is not available, however estimated distance between equipment along the cable routes has been provided. see addendum 3
43	3.7	Cables and conductors	Please provide, if available General cable list, at least for main equipment	Detailed cable list is not available, however estimated distance between panels/equipment along the cable routes has been provided. see addendum 3

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44	3.7	Cables and conductors	Please we need detailed Cable list for Gitaru Station including MV, LV, Protection, SCADA.....etc.	Detailed cable list is not available, however estimated distance between panels/equipment along the cable routes has been provided. see addendum 3
45	3.7	Cables and conductors	Shall we use the existing cables or we have to change with new cables...Please advise	All existing low voltage (<1000V) power cables and control cables to be replaced see addendum 3
46	3.9.3	Modification of existing plant control system	what is the existing PLC and SCADA Brand and Engineering License Part # & version	Employers' unit and common PLC's are Schneider modicon quantum 434a, SCADA software is ARC informatique's PcVue 8.0. Bidders shall however note that it's in not their scope to modify the employers' SCADA system but to interface to it. Modbus TCP and OPC shall be used for communication interfacing to employer's SCADA system.
47	3.9.3	Modification of existing plant control system	What is the existing Configuration of the Existing PLC 1, 2, 3 & Common PLC?	It is not a requirement of the tender for the contractor to carry out any hardware or software modification on the unit and common PLC's. Signals to be hardwired to the PLC shall be terminated by the contractor on the terminal blocks see clause 3.9. Communication interfacing to the employer's PLC's shall be done in conjunction with employer's engineers. All communication interface to employers' PLC's shall be via Modbus TCP. During design details necessary for communication interfacing shall be provided.

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48	3.9.3	Modification of existing plant control system	Are there any space for additional IO Cards?	It is not a requirement of the tender for the contractor to carry out any hardware or software modification on the unit and common PLC's. Signals to be hardwired to the PLC shall be terminated by the contractor on the terminal blocks see clause 3.9.
49	4.2	Generators	Confirmation that units normally work at voltage 15 kV	Generator ratings are as given in clause 4.2
50	4.2	Generators	provide the reactance's (transient, sub transient overall) for G1	see addendum 3
51	5	Particular technical specifications: excitation systems	Please let us know about the model of existing system.	Refer to the drawings provided during site visit and clause 5.2
52	5.3.1.2	(s) Panel ingress Protection (Control part): IP54 (t) Panel ingress Protection (Power part): IP4X	Due to installation condition please confirm IP41 instead of IP 54 is an acceptable solution	As per tender requirements
53	5.3.10.3 (b)	Two thermo-switches each with two settable SPDT contacts for alarm and trip shall be provided for excitation transformer temperature alarm and trips.	Please confirm if it is possible to offer digital Thermal relay connected to RTD of 3 windings and core, instead of mechanical thermo-switches	As per tender requirements
54	5.3.2.1(f)	Converter shall be removable while the generator is operational	What does this mean	The converters shall be draw out type i.e. withdrawable. See addendum 3
55	5.3.2.1(f)	Converter shall be removable while the generator is operational	Because of converter redundancy and converter cooling fan redundancy, the suggestion is to have a fixed converter	The converters shall be draw out type i.e. withdrawable, this is a mandatory requirement. See addendum 3
56	5.3.3.2(b)	The D-AVR shall be a microprocessor based digital programmable logic controller (PLC) fully compliant with requirements of IEC61131	Compliant with IEC 61131-3	as per tender requirements

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57	5.3.4.9	(e) Two (2) panel cooling fans. (i) shall be installed to maintain the panels temperature below 25°C with door closed and ambient temperature at 45°C. (ii) One fan shall be capable of maintaining the panel temperature below 25°C. (iii) The fans shall have an air flow rate of at least 2400m ³ /hour each with a power rating of at least 185W (iv) They shall be installed at the panel roof. (v) Panel shall have at least two louvered air vents with a filter for cooling air circulation	with IP41 protection degree, system cooling can be guaranteed without conditioning system	IP54 to be used for regulator panel as per clause 5.3.1.2, a suitable heat exchanger can be used in order to meet requirements of clause 5.3.4.9
58	5.4.4.6	Black start/line charging mode of operation	Is black-start capability required for the excitation system?	yes, see clause 5.4.4.6
59	6	Particular technical specification: generator MV switch gear	Could you please provide the technical specs for Gen circuit breaker?	see clauses 6.2 & 6.3
60	6	Particular technical specification: generator MV switch gear	Will there be high speed transfer between MV busbars?	No, see scope of works clause 2 and employer's requirements illustration drawings for requirements overview
61	6	Particular technical specification: generator MV switch gear	Is there any MV distribution, do we need to auxiliary transformer for this?	No, see scope of works clause 2 and employer's requirements illustration drawings for requirements overview
62	6.2.2.3	Bypassing the Generator circuit breaker	Is there a bypass requirement in Generator 1 Machine Breaker?	yes, see clause 6.2.2.3

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63	6.2.5.1	Station transformer HV terminals shall be interfaced to the MV switchgear feeder panel using HV cables. The cables shall meet the following requirements (g) Mounting steel structures and supports shall be provided for installing the cable and connecting to station transformers (h) Cables shall be terminated to the existing station transformers HV terminals from the MV switchgear panel. All installation devices shall be supplied and terminations carried out by the contractor	Please clarify which kind of cable installation is needed or required (concrete cableways, trays over ground or something different)	concrete cableways to be constructed See addendum 3
64	6.3.2.7	The enclosure shall have a shipping split into two parts for ease of transportation/shipping.	Is it Mandatory to divide the M.V Switchgear housing into two parts? Please advise	As per tender requirements The housing shall be factory built and then transported to site, it is not possible to transport the housing as a single unit on the available roads.
65	6.3.3	Housing Structural requirements	Please advise if Sandwich panel with density 40 Kg/Cm and 10 cm thickness is accepted or not.	MV switchgear housing structural requirements shall be as per tender requirements, see clause 6.3.3
66	6.3.4	Mounting/Supporting Steel Structures	Please clarify whether Chinese standard steel can be adopted	No, see clause 3.1.3 Equipment and works shall conform to standards of the bodies indicated clause 3.1.1 and 3.1.2 ONLY no other standards from other bodies shall be allowed.
67	6.3.4	Mounting/Supporting Steel Structures	Please clarify whether concrete mounting structure for the mv switchgear housing can be accepted.	As per tender requirements

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68	6.3.4	Mounting/Supporting Steel Structures	Kindly provide the Geotechnical investigation report and topographic map of proposed site for the MV Switchgear	It's not available. Geotechnical survey shall be carried by the contractor if they find it necessary to do so in order to meet the requirements of the tender/contract for the construction of MV switchgear structures.
69	6.3.4	Mounting/Supporting Steel Structures	Kindly provide following Information about construction drawings or as-built drawings of original substation, including: (1) 15kV Busbar support installation drawings and foundation construction drawings;	The dimensioned drawings of the 15kV Busbar support structure were provided during site visit. See drawing 5.314.0.0. /136 "GITARU SUBSTATION 15KV CABLES SEALING ENDS" Bidder who undertook the mandatory site visit are free visit the site again for any other additional data collection
70	6.3.4	Mounting/Supporting Steel Structures	Please clarify the design of steel structure and civil work shall be in accordance with either British or American standards.	British standards See clause 3.1.2 for standards acceptable to the employer where a standard has not been explicitly stated in the particular specification
71	6.3.4.5	The existing 15Kv bus bar supports shall be modified and re-used as the steel columns where possible. Additional galvanized steel columns shall be added if existing structures are not adequate.	We recommend the existing supports be removed and construct brand new mounting structure, since the loading capacity of existing supports cannot be evaluated accurately	This is ok as it meets the tender requirements see clause 6.3.4.5. Contractor can choose to modify and re use the existing steel columns or use new galvanised steel columns as stated in clause 6.3.4.5.
72	6.3.7.3	Emergency lighting shall be provided supplied from 110V DC supply with two directionally adjustable illuminating heads. This shall automatically come on in the event of loss of AC supply This shall automatically turn off on	Emergency light shall be fed from 230VAC.... Please confirm	As per tender requirements

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		resumption of normal power supply.		
73	7	Particular technical specification: protection systems	The existing CT, VT, NER will be used or do we need to replace them? Is it in the scope of tenderer or contractor?	All electrical protection systems for unit 2 and 3 to be replaced, see clause 2.5 for scope of supply and employer's requirements illustration drawings for requirements overview
74	7	Particular technical specification: protection systems	Where will the communication cabinet be situated?	Control room
75	7	Particular technical specification: protection systems	Please clarify the specifications for synchronizing and protection relays.	see clauses 7.4 and 7.5.2
76	7	Particular technical specification: protection systems	Please list all the CBs which need auto or manual synchronization function in the whole scope	GSU transformer 132KV CB and EDG ACB. GCB synchronisation scheme is not in the scope, but VT's and VT wiring shall be provided see clauses 7.4 and 7.3.6.7(f-g)
77	7.2	Existing protection equipment	Is block differential existing or not	see drawing OG-3-506 provided during site visit for existing protection system description
78	7.3.2.4(b)	The two protection sets for generator shall be divided into two electrically separate parts by means of having: (i) Separate DC power supply from auxiliary supply board, (ii) separate current transformer cores, (iii) separate voltage circuits, (iv) separate tripping lock out relays, (v) separate cables, (vi) Separate protection	Note: redundancy will be guaranteed for new equipment. Existing equipment (CTs and VTs on neutral side of generator; neutral point of generator; neutral point of GSU transformer; 132 kV and 220 kV substation; etc..) will be re-used as it is without redundancy	separate CT cores already exists on the neutral side of generator; neutral point of GSU transformer; 132 kV substation; etc as illustrated in the provided drawings. For VT on the neutral side of generator; 132 kV substation; etc redundancy shall be provided from the VT marshalling kiosks where the two circuits shall be parallel and not at the protection panel see clause 7.3.2.6(d) and 7.3.3.6 (d)

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		supply supervision (vii) Wiring to different circuit breaker tripping coil.		
79	7.3.3.10	Remote HV breaker control and Synchronizing scheme	Please confirm synchronizing system will be limited to unit 2 and 3	Unit 2 & 3 only. Scope of protection system work is as stated in clause 2.5.1.1
80	7.3.3.10	Remote HV breaker control and Synchronizing scheme	Please clarify how you manage synchronization on 132 kV breaker in the current situation; is there already an automatic synchro relay?	There is an existing automatic synchronisation system for the 132KV CB's installed in the manual control panels at the power house. This system shall be transferred to 15kV breakers with the new system
81	7.3.3.10	Remote HV breaker control and Synchronizing scheme	In the new configuration, Unit 2 & 3 will have 2 possible parallel point, on GCB and on 132 kV breaker. Please clarify how you will want to manage these 2 points, and if the new Sychrotact shall be able to manage 2 parallel points, or if it shall be designed for 1 parallel point	A new sychrotact shall be provided for the 132kV side synchronisation while the existing sychrotact shall be used for the GCB synchronisation (see employer's requirements illustration drawings sheet 7). Functionality of the 132kv side synchronisation shall be as detailed in clause 7.3.3.10. see clause 7.3.3.10(c-d) for more explanation.
82	7.3.3.10	Remote HV breaker control and Synchronizing scheme	Please confirm that the new automatic synchro relay shall be installed inside GSU protection panel, and if yes if a dedicated mimic with selectors/pushbuttons	see clause 7.3.3.10 GSU protection scheme equipment shall be housed in the GSU protection panel see clause 2.5.3

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			shall be designed on this panel.	
83	7.3.3.10	Remote HV breaker control and Synchronizing scheme	<p>In the step-up transformer protection requirement, two functions are mentioned as following: 1) 25-HV, HV side synchronization check , 2) 21L (line distance protection. Please simply describe the main principle and function. 3) Please clarify How the 132kV CB auto synchronization is achieved and which device include this function so far. Also confirm whether this function is under the scope if yes, please confirm the distance from 132kV PT to control room.</p>	<p>Synchro check (ANSI 25) and line distance (ANSI 21L) protection functions are mandatory requirements to be provided on the GSU transformer protection IED as per tender requirements.</p> <p>Detailed description on how each protection function operates can be obtained from the various standards such as IEEE 242 IEEE Buff Book™ , IEEE 141 IEEE Red Book™, ANSI-IEEE C37.2-2008, IEEE C37.102, IEC60255 etc.</p> <p>A new synchrotact shall be provided for the 132kV side synchronisation while the existing synchrotact shall be used for the GCB synchronisation (see employer's requirements illustration drawings sheet 7).</p> <p>Functionality of the 132kv side synchronisation shall be provided by the contractor as detailed in clause 7.3.3.10. see clause 7.3.3.10(c-d) for more explanation.</p> <p>Exact cable lengths are not available, however estimated distances between various plant equipment along the cable routes has been provided, see addendum 3.</p>

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84	7.3.6.7	EDG remote control scheme	Please confirm EDG remote control scheme can be installed inside EDG/Alternative transformer protection panel	EDG control scheme is part of Emergency Diesel Generator (EDG) Protection & control Scheme clause 7.3.6, for panel requirements see clause 2.5.1.2 & 2.5.4. All requirements of EDG protection and control scheme are given in clause 7.3.6
85	7.3.6.7	EDG remote control scheme	Please confirm EDG protection relay is intended to be a specific control and protection unit for EDG	EDG control scheme is part of Emergency Diesel Generator (EDG) Protection & control Scheme clause 7.3.6, for panel requirements see clause 2.5.1.2 & 2.5.4. All requirements of EDG protection and control scheme are given in clause 7.3.7
86	7.3.9.1(a)	Plant Information Management System (PIMS) Shall consist of: two redundant servers installed on the existing SCADA cabinet, each with software as described in the specifications that follow. Shall collect data from employers' SCADA DBS server, IE61850 gateway, excitation, LV switchboards SCADA interface and other plant systems.	Required Servers to be redundant or simplex?	as per tender requirements

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Item No.	TENDER CLAUSE NO.	TENDER ARTICLE	Question/additional information sought by tenderers.	Clarification
87	7.3.9.1(a)	<p>Shall consist of: two redundant servers installed on the existing SCADA cabinet, each with software as described in the specifications that follow. Shall Tender for rehabilitation of Gitaru Power Station Excitation, Generator MV Switchgear, LV Switchboards and Protection systems Page 355 of 492 Vol II: Technical Specifications June 2017 collect data from employers' SCADA DBS server, IEC61850 gateway, excitation, LV switchboards SCADA interface and other plant systems.</p>	<p>Please clarify what data PIMS shall connect from SCADA DBS server.</p>	<p>Plant equipment such as generators, turbines etc are interfaced to employer's PLC's, the employers' DBS servers collect data from all the employer's PLC's. The PIMS functions shall require data from the plant equipment. Information required for these PIMS functions from the existing equipment not in scope of supply shall be available in the employers' DBS server. A minimum of 5000 tags from the employers' DBS server shall be read by PIMS server.</p>
88	7.3.9.4(c)	<p>An OPC client shall communicate with devices on the SCADA network i.e. plant database server (existing at the station), IEC61850 gateway, excitation system, LV switchgear, metering equipment and other plant systems.</p>	<p>The new device network shall communicate with existing SCADA server by OPC protocol as TS, OPC is not an industrial based protocol. Please clarify whether any other protocol can be supported by existing SCADA server, such as Modbus, IECXXX</p>	<p>As per tender requirements OPC tunnelling shall be provided for interface to employers DBS server utilising OPC DA. Systems (OPC servers) provided under the scope of supply of this project shall be interfaced to the PIMS OPC client via OPC UA (IEC TR 62541) see clause 7.3.8.4(e), 5.3.4.12(h)/(i) and 8.3.9.5</p>
89	7.4.2.13 (a)	<p>Using the existing current transformers, voltage transformers, generators, transformers, circuit breakers etc. the contractor shall carry out calculations in order to determine the required settings for all the protection functions. The contractor will request the required data from</p>	<p>Please confirm whether setting calculation of all the protections IED is under the scope.</p>	<p>As per tender requirements see clause 7.4.2.13</p>

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		the client after the tender award.		
90	8	Particular technical specification: station low voltage switchboards	What are the cable lengths to the spillway and intake?	Exact cable lengths are not available, however estimated distances along the cable routes has been provided, see addendum 3.
91	8	Particular technical specification: station low voltage switchboards	The rating for Operating Voltage since outgoing voltage from transformer is 433 V AC, Diesel Generator is 415 V AC, CB rated is 500 VAC and busbar rated as 690 VAC.....Please Clarify	The rated operating voltage for all LV switchboards and equipment shall be 690V AC as per clauses 8.5.10.2, 8.6.1.2, 8.6.3.2, 8.6.5.4 etc. The outgoing voltage from the transformers is 433V as given in the drawings and specifications. The rated voltage of equipment to be supplied shall however be 690V AC NB in the employer requirements illustration drawings sheet 11-15 the circuit breakers breaking and making current rating requirement at 500V AC is given, this is not the rated operating voltage
92	8.3	Switch boards requirements	All feeders are draw outPlease Confirm	yes, see clauses 8.3.2.4, 8.3.3.3, 8.3.4.3, 8.3.5.4, and 8.3.6.2
93	8.3	Switch boards requirements	Earthing switch is not Not Applicable for LV SwitchboardPlease Confirm	Yes, earth switch has been removed as a requirement for LV switchboards. see addendum 3
94	8.3	Switch boards requirements	It is not feasible to offer main station switch board and main station auxiliaries switchboard that can fit in the available space with the requirements of earth switches interlocked mechanically to the ACB's	Earth switch has been removed as a requirement for all LV switchboards. see addendum 3

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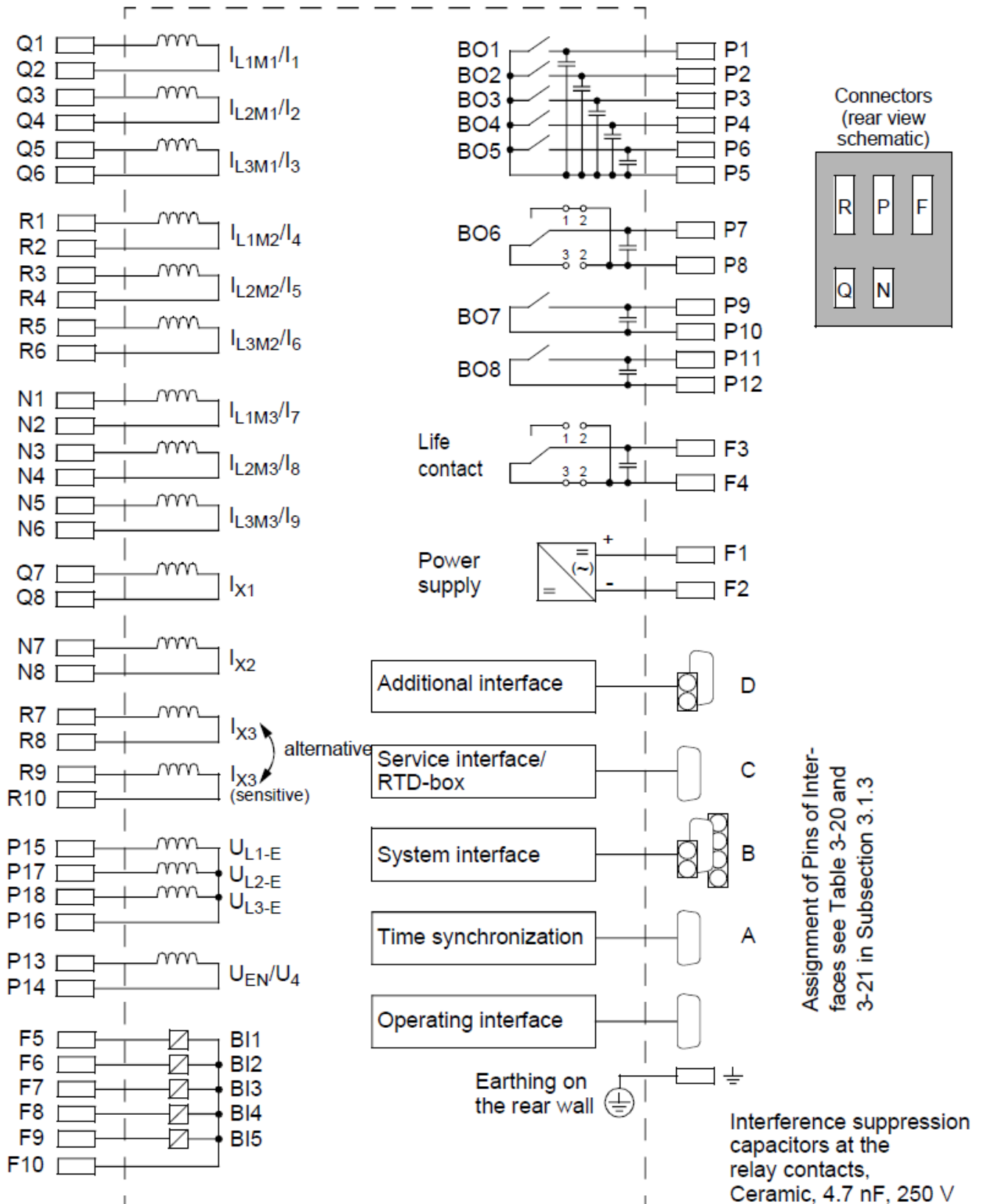
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95	8.3	Switch boards requirements	Incomer switching devices with mechanical interlocks (ACB, MCCB or contactors) shall be positioned in the same switchboard compartment	Mechanical interlocking between incomers has been removed as a requirement for all LV switchboards. The incomers shall be positioned in separate compartments as per tender requirements. see addendum 3
96	8.3.2.1 (g)	Only one incomer shall be connected to each bus section at a time with the exception of EDG incomer which may be synchronised to an active bus bar as detailed in the protection specifications. An automatic changeover scheme shall be implemented, the scheme shall be hardwired relay logic interlocks on each incomer circuit breaker control circuit. Interlocks shall also be implemented to prevent closing of more than one incomer to the same bus section (except EDG synchronisation)	The sequence of operation between Incoming transformer, Incoming Generator and bus coupler is needed Please illustrate	see clause 8.3.2.1 (g). Detailed operation sequence and interlocks shall be provided during design.
97	8.3.2.6	Station transformers On-load Tap Changer(OLTC) Motor Drive Units	In order to be able to offer the suitable requested motor drive unit for OLTC we need to have the serial numbers of the related On-Load Tap Changers. Kindly ask to provide the serial numbers of OLTCs.	for unit 3 station transformer MR OLTC drive unit Serial number: 00153TM Fabrication NO. 10776 Year: 1976 Drive type: AIII 100
98	8.3.4.7 (c), 8.3.5.6(c), 8.3.6.6(c)	If Programmable logic controller (PLC) shall be used for interfacing (i) It MUST be either of the following brands • Schneider Modicon quantum • Schneider Modicon momentum • Siemens S7 series	Please confirm if equivalent PLC can be used	as per tender requirements

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99	8.5.10.2(h)	LV boards shall meet the following primary ratings and features: IP degree of protection as per IEC 60529: IP 54	Please confirm IP 4X can be acceptable	as per tender requirements
100	8.6	Switchgear equipment specification	All CBs are equipped with lockout relay? Please confirm	All Power ACB's and MCCB's rated above 160A shall have ETU's with lockout functionality see clauses 8.6.1.11, 8.6.3.6 & 8.6.3.7
101	8.6.3.4	All MCCB's rated above 160A shall have an electronic trip unit and support Modbus RTU (RS 485) serial communication.	All Motor Starters with ETU can be provided with motor management device/controller (MMC) and the configuration will be (CB +MMC +Contactor) i.e. Communication will be through MMC not C.B.Please Confirm	All MCCB ETU's shall support serial communication and shall be interfaced to serial device servers (ethernet gateways) as detailed in the tender. Motor management device/controller can be provided as an addition however the MCCB's shall have ETU's supporting serial communication.
102	8.6.5	Motor Protection Circuit breaker, MPCB	All Motor without ETU is provided with thermal over load and the configuration will be (CB + Thermal O/L +Contactor).Please Confirm	Motor Protection Circuit breakers, MPCB's shall have inbuilt motor thermal overload and broken conductor/negative sequence protection function. They shall be suitable for small motors protection. A separate thermal over load relay is not necessary, bidder may add if they deem it necessary.
103	9	Existing equipment drawings & specifications	provide the Cross section and estimated length of MV cable lines from generators to substation	For unit 2 & 3 the generator MV cable cross section area is 4X1000mm ² per phase Estimated length of generator MV cables is as follows unit 1: 230m, unit 2: 220m and unit 3: 250m
104	9	Existing equipment drawings & specifications	Confirmation that the whole single line diagram is like the one in the attached file	Single line for unit 2 and 3 are per provided drawings. (see employer's requirements illustration drawings sheet 5, 7 & 8 in blue). Single line for unit 1 to be provided via email

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Sample block diagram showing all the inputs and outputs of a numerical protection relay/IED as required of the bidder in tender clause 1.4.1.3 (k). See clarification1 item no.7



ACKNOWLEDGEMENT OF CLARIFICATION NO. 1

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

Signed.....

Tenderer.....

Date.....