

GMR KAMALANGA ENERGY LIMITED



1X350 MW EXTENSION OF 3x350 MW KAMALANGA THERMAL POWER PROJECT AT DHENKANAL DISTRICT, ODISHA, INDIA

AMENDMENT-1

Amendments after Pre Bid Meeting - 1

SWITCHYARD EPC SPECIFICATION

MAY 2026

CONSULTANT



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Notes:

1. This Amendment (Amendment-1) supersedes all earlier Amendments, Clarifications, Corrigendum, and Minutes of Meetings with bidder, Recorded notes and correspondence made in regard to the clauses covered within the Amendment booklet.
2. Final Mandatory Spares and Tools & tackles to be considered for supply may vary from bidder to bidder in accordance with the system/sub system offered by the respective bidders but shall be in accordance with signed Minutes of meeting as finalized with the respective bidders.

AMENDMENTS FOR 1X350 MW GKEL EXTENSION PROJECT (UNIT # 4)

Sl. No.	Vol. No. /Page no./ Sec. no. /Clause	Original Text	Amended Text /Addenda/Deletion
1.	VOL-II, SEC-IV: 1.02.02 Terminal points for the switchyard package contractor:	(a) The overhead line (including gantry if required) near generator transformer, including and up to ACSR/INVAR conductor droppers to HV terminals of generator transformer shall be in scope of switchyard package contractor. The terminal clamps on generator transformer HV terminal are excluded from scope of switchyard package contractor (BOP Contractor).	AMENDED AS (a) The overhead line from dia. #5 to near generator transformer, including and up to ACSR/INVAR conductor droppers to HV terminals of generator transformer shall be in scope of switchyard package contractor. The terminal clamps on generator transformer HV terminal are also included in scope of switchyard package contractor. All required conductor, insulator, hardware and fitting for stringing of overhead conductor from GT HV bushing to 400KV switchyard shall be in switchyard package. Supply and erection of LA near GT shall be included in the scope of switchyard package. Supply of gantry structure shall be in the scope GKEL however construction of foundation and erection of gantry shall be in switchyard package.
2.	VOL-II, SEC-IV: 1.02.02 Terminal points for the switchyard package contractor:		ADDENDUM AS (c) Any required modification in existing 400KV switchyard for connectivity of DIA-5 for existing bus-1&2 extension, sectionalized isolator relocation in between DIA-3&4, any requirement of modification of gantry and support structure, insulator, jumper, BPI, control & power cable etc. and shifting of lightning tower, removal of existing fencing, relocation of firefighting pipe line and construction of same as per new layout shall be in switchyard contract scope.
3.	VOL-II, SEC-IV 3.03.04	(16) (g) The backup directional earth fault protection is included under PLCC carrier aided (alternatively FOTS) transfer trip scheme.	AMENDED AS The backup directional earth fault protection is included under Fiber Optic Transmission System (FOTS) carrier aided transfer trip scheme.
4	VOL-II, SEC-IV 3.03.04		- Line differential relay (4 no's) two at each side to be provided instead of distance protection relay, in Dia – 5. - Two no's of BUS - CVTs to be provided, so that U#1,U#2 and U#3 will be in one bus topology scheme and U#4, Solar Plant will be in another bus topology. - Bus bar protection scheme to be integrated with Dia – 4. and Dia -5 - The equipment to be supplied as per the attached approved OPTCL vendor list (Annexure-1) - Existing SAS already hooked up to existing DCS in unit#1&2, However bidder to extend the existing SAS system to unit#3&4 main control room(CCR). Necessary modification if any for integration with existing SAS shall be in the scope of bidder. - Bus bar shall be QUAD AAAC and all other equipment shall be connected with Twin ACSR Moose/Aluminium Busbar. 400 kV CVT near GT Bay shall be 1 No Single Phase CVT for metering and synchronization also 400 kV CT - Extra Single Core CT for Tariff Metering required - Any required modification for relocation of sectionalized isolator in between DIA-3&4, any requirement of modification of gantry and support structure, insulator, jumper, BPI, control & power cable etc. and shifting of lightning tower, removal of existing fencing, relocation of firefighting pipe line and construction of same as per new layout shall be in switchyard contract scope - Communication protocol shall be IEC 61850 with edition 1&2 compatible shall be considered - cable trench to be design and construct by this package owner for trench between unit #4 main building to switchyard also Cabling in between GRP to SWYD. - Bidder to consider the spares for 2years including cost and same need to approve by GKEL. - Tariff Meter Panels will be located in AC KIOSK. - Two no.s of BUS - CVTs to be provided, so that Dia#1,Dia#2 and Dia#3 will be in one bus topology scheme and Dia#4, Solar Plant and Dia#5 will be in another bus topology. - New bus bar scheme to be implemented for Dia-5 along with existing Dia-4. CU and PU scheme shall be implemented and New bus bar protection relay to be provided for existing Dia-4 and to be integrated with new relays of Dia#5 - Dia#4 & Dia#5 should be integrated in one bus topology. So, necessary PU

			& CU relays to be considered along with fiber network. Existing Relays are (CU- Micom P741 & PU- Micom P743) The scheme can neither be hooked up to existing bus bar scheme nor to be connected with existing master trip relay 16. Communication link to be established from existing SAS system to Unit#4 DCS system. 17. Carrier lead shall be brought thru OLTE 18. Engineering, supply, installation and commissioning of gantry along with supply of insulators, clamp & connectors, stringing activity with supply of conductors for extending the STU line from Dia – 3 to Dia – 4 will be in bidder scope. To maintain the clearance if any 400kv equipment of Line Bay of Dia – 4 is to be relocated then it will be in bidder scope including foundation, erection and commissioning.
4.	VOL-II, SEC-IV: 4.04.04 Carrier Connection	Carrier connection shall be done through OLTE equipment and digital protection coupler. a) The carrier lead shall be brought out of steel base through high frequency bushing. Carrier terminal shall be kept earthed if not used. b) Additional protective devices for carrier equipment shall be furnished as follows: i) Drain Coil ii) Lightning Arrestor iii) Grounding Switch c) These protective devices shall be complete with hardware for mounting on CVT support structures.	AMENDED AS Carrier connection shall be done through Optical Line Transmission Equipment (OLTE) and Digital Protection Coupler. i) Description: The fibre optic communication network shall support the voice & data communication requirements of RTUs, SCADA / EMS system, Power system protection and other operational requirements ensuring complete compatibility and integration with the existing system at both ends (as applicable). The communication system shall provide data & voice of RTUs/SAS located at various locations, reporting to Control Center using IEC 60870-5-104 Protocol, in point to multi point and/or multipoint to multipoint configurations using Ethernet over Synchronous Digital Hierarchy (SDH). Fibre optic network links shall have a minimum bit rate of Synchronous Transport Module-4 (STM-4) for nodes falling in ring and linear network. Higher bit rate systems, are acceptable, so as to meet the link budget requirements or any other requirement. ii) Communication channel system shall be matched with the existing system. Basic guiding requirements are as below: (a) High speed E1 channel support (b) Network Management channels either through Data Communication Channel (DCC) or through data channel as per site requirement. (c) The connectivity between RTUs / SAS and Control Centre is Wide Area Network (WAN) on TCP-IP using IEC 60870-5-104 protocol. (d) Offered equipment supporting interconnection with Tele-Protection system via E1 interface. iii) System Synchronization: In addition to GPS input reference, the synchronization clock must have provision to take INPUT reference coming from other existing clock(s). The synchronization plan and equipment to be as per standard ITU-T G.811. The holdover quality of slave clock, if any, shall meet ITU-T G.812 standard requirements. System-wide synchronization fully distributed throughout the telecom network and connected to all equipment new & existing, meeting the ITU-T G.803. A 2MHz synchronization output to be provided from each of the equipment, as per compatibility.
5.	VOL-II, SEC-IV:		ADDENDA AS 7.00.00 Rejection Clause The equipment and the work are liable for rejection due to below-mentioned reasons: a) The witnessed tests and other submitted test reports are not successful as per latest applicable standards and are not approved. b) The transportation and installation cause any damage or deterioration. c) The working and/or output of the equipment do not meet the client's standard requirements. d) The erection-commissioning are not as per the client's standard requirements.
	ENGINEERING CRITICAL POINTS		The key critical engineering check points to be complied by bidder as listed below. ● Busbar protection upgrade (existing CU has no spare capacity) ● SAS integration philosophy (data mapping + FO redundancy) ● Line protection coordination (new differential scheme) ● CT core sizing (needs careful burden calculation) ● Grounding extension with existing grid ● Clearances as per CBIP/CEA ● Integration with SLDC/GRIDCO approvals

	TESTING PARAMETERS & METHODOLOGY		Electrical Equipment Testing Factory Tests (FAT) Routine tests (IEC) Type test certificates (mandatory) Special tests (as applicable) Major Tests:														
			<table><tr><th>Equipment</th><th>Tests</th></tr><tr><td>CB</td><td>Timing, contact resistance, SF6 density, TRV</td></tr><tr><td>CT</td><td>Ratio, polarity, excitation, knee point</td></tr><tr><td>CVT</td><td>Accuracy, capacitance, ferro-resonance</td></tr><tr><td>LA</td><td>Residual voltage, leakage current</td></tr><tr><td>Isolator</td><td>Mechanical endurance, contact resistance</td></tr><tr><td>Relay</td><td>All Protection testing & simulation</td></tr></table>	Equipment	Tests	CB	Timing, contact resistance, SF6 density, TRV	CT	Ratio, polarity, excitation, knee point	CVT	Accuracy, capacitance, ferro-resonance	LA	Residual voltage, leakage current	Isolator	Mechanical endurance, contact resistance	Relay	All Protection testing & simulation
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Site Testing																	
• Primary injection (CT) • Secondary injection (relay) • IR test (5 kV / 10 kV) • Continuity check • Functional interlock check • SAS/SCADA integration testing • End-to-end protection testing																	
			Civil Testing														
			• Concrete • Slump test • Cube strength (7 & 28 days) • Rebound hammer (optional) • Steel: • Chemical & mechanical properties • Weld testing (DPT/UT)														
	OWNER HOLD POINTS		These are mandatory inspection stages where work shall not proceed without Owner approval. 1. Design Stage GA drawings approval SLD approval Protection scheme approval Foundation design approval 2. Procurement Stage Vendor approval QAP approval Drawing approval Type test verification 3. Manufacturing Stage Stage inspection (CB / CT / CVT) FAT witness by Owner Dispatch clearance 4. Construction Stage														

			Foundation excavation inspection Reinforcement inspection Concrete pouring clearance Structure erection alignment check Equipment erection inspection 5. Testing & Commissioning Pre-commissioning clearance Functional checks SAS integration and simulation checking Final energization approval QUALITY ASSURANCE & CONTROL (QAP) REQUIREMENTS Vendor must submit QAP (Quality Assurance Plan) which Includes as mentioned below Raw material inspection Stage inspection Final inspection Test witnessing points
6	Lab Testing Equipment		1. Omicron Relay testing kit with dual channel 2. Portable DGA analysis kit 3. Partial discharge test kit –Omicron 4. Vidar test kit for VCB 5. Partial Discharge kit 6. DCRM test kit