Pre Bid Technical Clarification No.7 dated 17.05.2025 to NIB No.475 dtd 21.01.2025 for PKG-III EM Works of 186 MW Tato-I HEP

Sr. No.	Volume	Clause No.	Clause name	Page No.	Specification as per Bid Document	Bidder Query / Clarification	NEEPCO's reply
1	Vol-I, Sec-II(a): Information for Bidders	6.5	Bidder (Individual/Joint Venture/Consortium) with Sub-Contractors:		iii) The Bidder and his sub-contractor shall submit separate undertakings as per Format included in the Bid Document that the Bidder/sub-contractor shall be responsible for execution of that item of work for which they claim to have Specific Experience. iv) The Bidder and his sub-contractor shall submit Joint Deed of Undertaking (JDU) as pe rFormat included in the Bid Document. v) Sub-contractor shall submit Performance Bank Guarantee equivalent to 2.5% of corresponding value of Work sub-contracted in addition to the Performance Bank Guarantee for whole contract submitted by the Bidder on award of Work.	Kindly note that Sub-contractor of Transformer and GIS are not ready to accept the conditions and requirements as stated under subclauses iii), iv) and v). as they are not signing any direct conract with NEEPCO. From our side, we can submit the required certificate to establish the qualification of the sub-contractor. Moreover, EM Contractor is otherwise responsible for overall obligations under the contract and providing suitable bank guarantees. In view of above, we request you to delete this requirement from the tender document.	Refer MoM of Pre-bid meeting Dtd. 15.05.25
2	General				Transport limitation	We have conducted a detailed route survey and observed the limitation enroute. Considering the heaviest component (Pressure Shaft Valve) It is requested to please ensure to provide suitable road to transport the equipment of size at least Length 7.25 (m)X Width 5.6 (m) X Height 3.5 (m) and weight wise atleast 70 tons material without trailer must be ensured by NEEPCO. Any widening of road, chipping, strengthening and widening of bridges, cutting the trees and mountain edge, overhead wires etc. shall be in NEEPCO scope. Any delay in availability of road (including approach road) shall be to NEEPCO account.	Refer MoM of Pre-bid meeting Dtd. 15.05.25
3	Vol-I, Sec-III A : General Conditions of Contract	29.2	Training of personnel	29	29.2 ... Local transport during the training period, lodging and boarding expenses and other incidental expenses shall be borne by the Contractor during the entire period of training. The number of trainees in each group shall be decided in mutual consultation with the Contractor	We request you to please freeze number of man days for training so that suitable cost can be considered for lodging and boarding expenses. No. of trainee in each group shall be decided mutually.	Total man-months for training module shall be 20, which shall comprise of training in design- engineering, erection-commissioning & operation –maintenance of Protection system, governing system, Excitation system, SCADA, testing & commissioning and operation & maintenance. Detail program for training shall be finalized at the time of award
4	Volume II, Sec-III, Schedule of Requirements (SOR) Bid Document Vol-I, Sec-VII, Price-Schedules	20.1 & 17.05			5 km long 33 kV single circuit transmission line using "ACSR DOG" conductor, ... and provision for stringing of ADSS cable and mounting of street Lights on pole. 33 kV Transmission Lines from Power House to Valve House as per provisions given in the technical specifications	33 kV transmission line including obtaining 'Right of Way', 'Survey', 'Right-of-way clearance and access tracks' etc. is not possible for us to include in the scope being specialized job. Such requirement generally does not include in EM package scope. Reference can be drawn from various EM tender across PSU / private sector. We would like to insist and request to kindly exclude the 33 kV Line, ADSS and street lighting as mentioned in the clause from the scope of E&M contractor.	Refer MoM of Pre-bid meeting Dtd. 15.05.25
Main Inlet Valve							
5	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.6 - Turbine Main Inlet Valves 1.6.1.8	1.6.1.8 Description and Operation Requirements	42 of 57	Valve shall have two stainless steel working seals; one at downstream (service seal) for use during normal closure operations and other at the upstream (maintenance seal) for use during maintenance of service seal. Both seals shall be water operated with oil operated solenoid valves.The seals shall be of material having high resistance to silt erosion. Suitable protection against abrasion shall be provided to ensure high reliability of sealing and long life. Leakage, if any ,shall be stated and guaranteed. And **Pre bid technical clarification no. 6 dated 04.05.2025 point no. 5:** It is mentioend that same shall be decided during detailed engineering.	Kindly appreciate that certain cost and technology sensitive issues to be addressed at this stage. We again request you to accept Rubber seals for both service and maintenance seal for Main Inlet valve. Stainless steel working seals as specified in this clause are only applicable for spherical valve and not for butterfly valve. For butterfly valve only Rubber (NBR) seals are applicable. Kindly accept the above proposal.	Accepted.
Pressure Shaft Valve							

6	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.4	9.6.4 Valve Seals	6 of 26	The valve shall be provided with two seals – • one as service seal located downstream of the valve disc and • the other as reserve or maintenance seal located upstream of the valve disc. It should be possible to adjust service seal from downstream side of the valve by applying upstream seal and without dewatering upstream side of the valve. A provision shall also be made for rotation of valve disc by 180 degrees to facilitate repair / adjustment of upstream maintenance seal without dewatering upstream of the valve. Both seals shall be mounted on the periphery of the valve disc and be secured in position by means of clamping rings and screws. The sealing arrangement shall be Stainless Steel seat ring in body and synthetic nitrile rubber seal with retaining ring on the disc. The leakage at the seals shall be zero to achieve water tight enclosure when the valve is pressurized. The maintenance seal shall be inflatable hose seal type and shall held in position by clamping ring..... And **Pre bid technical clarification no. 6 dated 04.05.2025 point no. 7**: It is mentioend that same shall be decided during detailed engineering.	Kindly appreciate that certain cost and technology sensitive issues to be addressed at this stage. We would again like to emphasized that in line with Heo HEP tender requirement please accept single seal design. Please appreciate that Pressure shaft Valve is of huge size and contractor has to face challanges even with split body concept. And due to adoptation of split body design, it is not possible to meet the valve seal design as specified in the tender. Kindly review the above proposal and accept. Moreover, the weight and dimensions shall further increases if double seal design is adopted.	Accepted.
7	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.4	9.6.4 Valve Seals	6 of 26	The sealing arrangement shall be Stainless Steel seat ring in body and synthetic nitrile rubber seal with retaining ring on the disc. The leakage at the seals shall be zero to achieve water tight enclosure when the valve is pressurized.	The permissible leakge at the seals will be as per leakage clause mentioned in IS 7326. Kindly accept.	Accepted.
8	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.11.1	9.11.1 Performance Test	16 of 26	The valve shall be tested in a fully assembled condition along with hydraulic power pack and control panel. The valve shall be shop operated a minimum of ten (10) times from fully closed to fully open position and ten (10) times vice versa under a no flow condition to demonstrate that the complete assembly is workable. However, if the Employer is not satisfied or would like to test the functioning of the valve even after this, the decision to open and close the valve for more than ten (10) times shall be the Employer's.	Due to large size of valve, we propose to perform Funtional test of valve i.e. full opening & full closing of valve with the help of crane in workshop and not in a fully assembed condition along with hydraulic power pack and control panel. Hydraulic power pack and control panel will be tested at manufacturer separately due to different manufacturing schedule. However Functional test along with hydraulic power pack and control panel will be performed at site. Kindly review the above proposal and delete the testing requirement at shop.	Shop testing is preferable and as per TS.. However, it will be accepted to perform full system testing (valve + power pack + control panel) at the site, but before final acceptance.
9	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.11.2, 9.11.3	9.11.2 Body Hydrostatic Test, 9.11.3 Disc Strength Test	17 of 26	Both ends of the valve shall be blanked off (including upstream & downstream sections) so that the valve is subjected to the full pressure stress in all directions induced by the test pressure. With the valve disc in a slightly open position, the entire valve shall be subjected to at least 1.5 times the specified design pressure including pressure rise or twice the maximum operating pressure whichever is higher for at least 30 minutes. Under this pressure there shall be no leakage through the body or any trunnion seals and no parts shall be plastically deformed.	Due to large size of valve, we propose to perform the below: Body Hydrostatic Test & Disc Strength Test jointly by welding test dome on upstream extension pipe and applying service seal on downstream side and then applying test pressure. Test dome cannot be welded on downstream pipe as there will slip type dismantling joint in downstream pipe. UT will be perfomed on downstream pipe . Kindly accept our proposal and confirm.	It can be accepted only if its technically / practically not possible to follow the specifications.

10	Volume II Sec- II/Sub-Sec-18 Illumination System	18.1	General	1	Lighting system for Power House area, GIS Building, outdoor areas around powerhouse, Pothead yard area, approach road near power house, Valve House, Intake area and its approach roads etc.	Tender is silent on length of the roads to be considered where the illumination is to be considered by the Bidder. Please clarify the same to consider accordingly.	Illumination requirement for approaches to Power House, Dam Site, Valve House, Pothead yard shall be 500 m each.
11	Volume II Sec- II/Sub-Sec-17 Earthing System	17.2	System Requirements	1	The intent of scope is to supply, install and supervise complete earthing system for Power House, Transformer area, Pothead yard area, Intake area and control room at Intake, valve house and adjoining functional areas.	It is requested to Kindly provide the soil resistivity of the following areas for Bidding purpose. In case soil resistivity is not available, please arrange to provide one reference value so that all bidder consider the same. Any upward variation in soil resistivity shall be subject to price implication. 1) Power House 2) Transformer Area 3) Pothead Yard Area 4) Intake Area 5) Valve House Area	The bidder shall have to measure the resistivity on his own and design the earthing system subsequent to the purchaser's approval Refer clause 17.5 of PTS, Vol-II, Sec-II, Sub-Sec-17.
12	Volume II Sec- II/Sub-Sub-Sec- 14 Power and Control Cables Drawing no. W.003159-20719-ED-7003	14.1	Scope	1	➢ HT Cable 33 kV, of required size, stranded Aluminium Conductor, XLPE insulated, armoured , FRLS cables,	It is requested to Kindly provide the following route distance for estimation of 33 kV Cables : 1) From Local Supply termination to 33 kV Switchgear at Power House 2) From 33 kV Switchgear at Power House towards Termination for Local Distribution 1 & 2 3) From 33 kV switchgear at Power House towards the termination for Intake supply (Remote sites) Tender is silent on the distance and also not shown in drawing.	These length are to be estimated by the bidder with reference to the layout drawings.
Quality							
13	**Volume II Sec II Sub-Sec 08 Protection and Metering**	8.3		162-163	**c. Pre-FAT & FAT Activities:** A Pre-FAT shall be performed by the Contractor to verify that the system, as fully integrated, complies with all of the required functional details and that the system satisfies the response and resource utilization requirements. The Pre-FAT shall follow completely the test procedures of the FAT Plan reviewed by the Employer. The Contractor shall notify the Employer for the start date of the Pre-FAT at least four (4) weeks before the test. The Employer personnel will have an option to witness the pre-FAT activities;	Considering the overall schedule of project in 39 months, it is not feasible to invite NEEPCO in Pre FAT. We request that manufactur's will internally perform all the required routine test as per their firm standard before inviting customer to partcipate in Factory acceptance Test. Contractor will notify the customer to partcipate in FAT before 15 Days. Kindly accept.	The Contractor shall notify the Employer for the start date of the Pre-FAT before the test. The Employer personnel will have an option to witness the pre-FAT activities;
14	**Volume II Sec II Sub-Sub-Sec- 10 Transformers (Generator Transformers)**	10.46.3		66	**Type Tests on fittings: (1)-(10)**	Type test report for all these boughtout items is not feasible. Routine test certificates (Except HV Bushings, for which we shall provide type test report) shall be provided for review. Kindly accept.	Tests shall be as per relevant IS / IEC standards. Type test reports of similar components shall be accepted.
15	**Volume II Section II Sub-Section 2 Generator and Excitation System**	2.3.11.4		43	**<u>Wet Commissioning Tests</u>** Sudden short circuit test from not less than 0.50 rated terminal voltage to determine reactance and time constants;	For sudden short circuit test at Generator, it required the additional Generator Circuit Breaker (VCB type) for testing purpose. Please note that as per tender Single Line Diagram also there is no requirement of Generator Circuit Breaker and direct connection of Generator to Generator Transformer through Busduct. Since the current and short circuit rating are on higher side i.e. 4000A, 40kA and normal type VCB up to current rating 2500A, 25kA are not suitable to perform the sudden short circuit test at site. Special type circuit breaker are required which are not manufactured in India and to be imported from USA, Europe etc. Hence, it will be very costly that too for only testing purpose. This is not the usual practice in hydro industry as well. Please review the requirement once again.	Refer MoM of Pre-bid meeting Dtd. 15.05.25
16	**Volume-II Section-II**	2.3. Generator 2.3.5.8	Runaway Speed Withstand Capability Page no.10	10	The runaway speed test shall be conducted at site and shall be considered successful if, after undergoing the test for two (2) minute, no damage or injury is apparent. The Contractor shall furnish the detailed calculations to prove the Runaway speed withstand capability of the generators at the time of submitting the bid. The generator shall, after undergoing the test, be able to withstand the high voltage test at eighty five percent of the dielectric test voltage.	Being destructive in nature, we strongly recommended not to perform runaway speed test. This is also widely accepted industrial norms. We can submit the calculation for review. Please review the requirement again.	Bid stipulation shall prevail. However, may be examined during detail engineering.

Sl. No.	**Volume**	**Page No.**	**Clause No.**	**Tender Provision**	**Bidders Queries**	**NEEPCO's reply**
17	Vol-II, Sec-II, Sub-Sec-02,	Page – 43	Clause 2.3.11.4,	In this clause following Wet Commissioning tests are specified – 1. Sudden short circuit test from not less than 0.5 rated terminal voltage to determine reactance and time constants; 2. Sustained short circuit test to determine reactance; 3. Zero power factor saturation test; 4. Deceleration curve – determination of moment of inertia; 5. Deceleration loss test 6. Full runaway speed Test for 2 minute duration	1. Sudden short circuit test from not less than 0.5 rated terminal voltage to determine reactance and time constants; 2. Sustained short circuit test to determine reactance; 3. Zero power factor saturation test; Please note that for determination of above specified parameters, we need to conduct Sudden short-circuit test. In our opinion this test is a detrimental test; hence we do not recommend this test. The same may be deleted. Calculated value of reactance's and time-constants will be furnished. If still it is not acceptable, then alternatively for determination of specified above parameters, we recommend to conduct Standstill Frequency Response test (SSFR test) as per IEEE-115 at standstill condition. 3. Zero power factor saturation test; 4. Deceleration curve – determination of moment of inertia; 5. Deceleration loss test Please note that these tests are not practicably feasible to perform at site, therefore we do not recommend these tests to be performed at site. 6. Full runaway speed Test for 2 minute duration Being a detrimental test, We do not recommend this test.	Refer MoM of Pre-bid meeting Dtd. 15.05.25

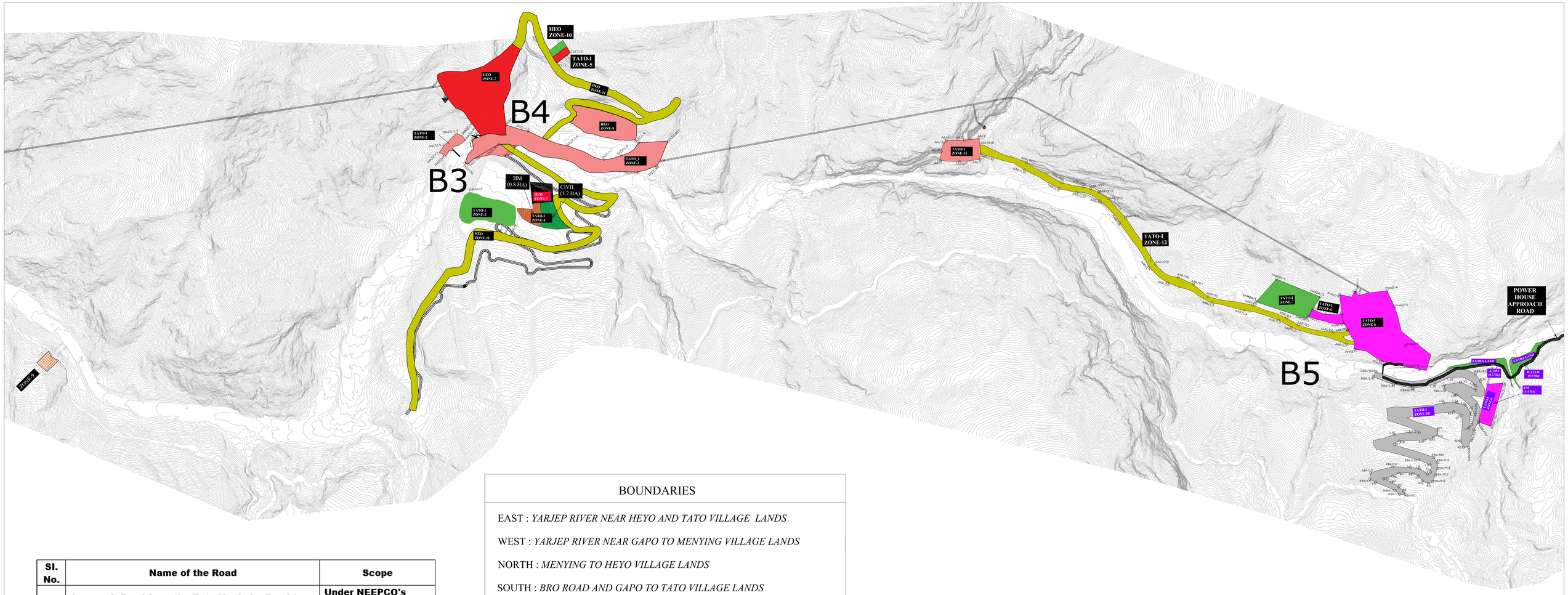
18	Vol-II, Sec-II, Sub-Sec-02,	Page – 44	Clause 2.3.11.4	In this clause following Field Acceptance and Performance tests are specified – 1. Impulse short circuit test at reduced voltage acc. To IEC60034-1, Para.24; 2. Determination of the values for Xd, X'd, X"d and Xq; 3. Determination of the following constants: T'do, T'd, T"d and Ta in accordance with IEC60034-4.	Please note that for determination of specified parameters, we need to conduct Sudden shortcircuit test. In our opinion this test is a detrimental test; hence we do not recommend this test. The same may be deleted. Calculated value of reactance's and time-constants will be furnished. If still it is not acceptable, then alternatively for determination of specified above parameters, we recommend to conduct Standstill Frequency Response test (SSFR test) as per IEEE-115 at standstill condition.	Calculated value of reactance's and time-constants shall be acceptable.
19	Vol-II, Sec-II, Sub-Sec-02,	Page – 39	Clause 2.3.10.2,	In this clause following Other instruments/ Devices are specified – 1. Multi Chartless temperature recorder with logging in DCS / SCADA; 2. Chartless Rotor temperature recorder with logging in DCS / SCADA	Please note that due to technology upgradation, these recorders are not required anymore. At present RTD temperatures can be monitored and displayed directly in LHMI and also in SCADA. In same manner, for rotor temperature, we can use readings of field voltage and field current from slip ring brushes and then we can convert it in Rotor temperature readings. This is more effective way of Rotor temperature measurement, as per our experience Rotor temperature recorder also are not required any more.	Accepted.

20	Vol-II, Sec-II, Sub-Sec-02,	Page – 30	Clause 2.3.7.16, iii,	Portable type (common to all units) PD monitoring system is specified in this clause	We propose for Continuous-online type PD monitoring system for each unit for measurement of partial discharge in machine continuously. Total 6 nos. (1 no PD coupler per phase per parallel path) of PD coupler will be provided for measurement of partial discharge in generators continuously.	Bid stipulation shall prevail. However, may be examined during detail engineering.
21	Vol-II, Sec-II, Sub-Sec-02,	Page – 30	Clause 2.3.7.16, iii,	Make of PD monitoring systems are specified as GE Energy, GE Omicron	Please note that Enquiry has to be floated as per Make in India policy. Whatever responses, we receive, we will send the same to you for approval	Bidder may chose alternative vendors, subject to prior approval (equivalent to suggested vender)
22	Vol-II, Sec-II, Sub-Sec-02,	Page – 33	Clause 2.3.7.16, iv,	Make of Air gap monitoring systems are specified as Vibro System or GEBentley Nevada.	Please note that Enquiry has to be floated as per Make in India policy. Whatever responses, we receive, we will send the same to you for approval.	Bidder may chose alternative vendors, subject to prior approval (equivalent to suggested vender)
23	Vol-II, Section-II, PART-II-03Sub-Sec-02GeneratorandExcitation System	42-43: WetCommissioningTests 44: FieldAcceptance andPerformanceTest	2.3.11.4 &2.3.11.5	Sudden short circuit test from not less than 0.50 ratedterminal voltage to determine reactance and timeconstants.Impulse short-circuit test at reduced voltage acc. to IEC60034-1, Para. 24;• Determination of the values for Xd, X'd, X"d, and Xq;• Determination of the following constants: T'do, T'd, T"dand Ta in accordance with IEC 60034-4;	For determination of reactance & time constants we need to conduct Sudden short-circuit test.Being an invasive test, we do not recommend to conduct this test.However, we will furnish the calculated values of transient and sub transient reactance's and time constants during detail design.Hence these tests may be deleted.Kindly confirm the acceptance.	Refer MoM of Pre-bid meeting Dtd. 15.05.25

24	Vol-II, Sec -II, PART-II -03 Sub-Sec- 02 Generator and Excitation System	20-Generator Shaft	2.3.7.8	The critical speed of the shaft at balanced condition shall be sufficiently (not less than 25%) higher than the runaway speed	Mentioned requirement is very much on higher side .We recommend that first critical speed of combined rotating parts of turbine and generator shall be at least 20% higher than the maximum turbine runway speed. Please review and confirm the acceptance of above	The critical speed of the shaft at balanced condition shall be 25% over the runaway speed.
25	Vol-II, Sec -II, PART-II -03 Sub-Sec- 02 Generator and Excitation System	20-Generator Shaft	2.3.7.8	The generator shafts shall be made of the best quality forged carbon steel confirming to ASTM A668 class E, properly heat-treated. A single shaft shall be offered with the condition that there is no change in the height of the power house and no pit shall be allowed in the service bay.	For generator Shaft we propose two shaft system because of following advantages, i) Lower lifting weight by power house crane ii) Required lower lifting clearances iii) Ease of handling top & bottom shaft and generator rotor iv) Suitable in maintenance purpose.	Bid stipulations shall prevail. However, the requirement may be reviewed during detailed engineering.

26	Vol-II, Sec -II, PART-II -03 Sub-Sec- 02 Generator and Excitation System	20- Generator Shaft	2.3.7.8	The generator shafts shall be made of the best quality forged carbon steel confirming to ASTM A668 class E, properly heat-treated	In this clause, standard for generator shaft is specified as ASTM A668 Class E As per our present Standard practice, we use material standard HG-10035 for generator shaft and it has been used in more than 500 generators. Please confirm acceptance of above material.	Refer Pre-bid technical clarification No. 2 Dated 17.03.2025 , Sl. No. 101.
27	Vol. II Sec I (PTS) 5: General technical Specification	10- Material Standards	0.3.4	Material standards	In this Clause for materials, ASTM Standards are Specified. Kindly accept use of equivalent IS (Indian Standard) in addition to ASTM standard. Material for generator component shall be selected so as to satisfy functional requirement with desired factor of safety (as stipulated in tender 2 of 3 specification).	Refer Pre-bid technical clarification No. 2 Dated 17.03.2025 , Sl. No. 103.
28	Vol-II, Section -II, PART-II -03 Sub-Sec- 02 Generator and Excitation System	19- III) Rotor Rim	2.3.7.7 . III	The rim shall be shrunk on the rotor spider and shall remain shrunk on the hot rotor when unit is rotating up to 110% of synchronous speed. The	As per our peactice we supply floating type of rim for rotor. Same type of design is used in more than 500 genrators supplied by bidder . In view of this, the design of rim shall be left upon bidder.	Refer Pre-bid technical clarification No. 2 Dated 17.03.2025 , Sl. No. 104.

29	Vol-II, Section -II, PART-II -03 Sub-Sec- 02 Generator and Excitation System	19- III) Rotor Rim	2.3.7.7. III	Cooling fan blades shall be cast aluminum and constructed to preclude vibration.	As per our practice we propose fabricated type aerofoil Fan blades . Kindly confirm the same	Refer Pre-bid technical clarification No. 2 Dated 17.03.2025 , Sl. No. 105.
		26- Rotor Fan	2.3.7.13	The Axial Fans will consist of a large number of speciallyshaped aerofoil aluminum blades assembled to thefabricated support segments.		
30	Vol-II, Section -II, PART-II -03 Sub-Sec- 02 Generator and Excitation System	24- Type of lubrication oil	2.3.7.10	For bearing lubrication, machine or turbine oil of viscosity class VG100 shall be used. The recommended types of lubricating oil are SHELL Vitrea 100 or LOTOS L-AN 100	Oil of viscosity class ISO VG, 46,57 & 68 are sufficient for performance of the bearings. Kindly allow use of the above grades of the oil.	Refer Pre-bid technical clarification No. 1 Dated 07.03.2025 , Sl. No. 79.



Sl. No.	Name of the Road	Scope
1.	Approach Road from the Tato-Mechuka Road to the Right Abutment of the Bridge at d/s of the Tato-I Weir	Under NEEPCO's Scope (to be executed by Heo HEP EPC Contractor)
2.	Approach Road from the Tato-Monigong Road to the Right Abutment of the Bridge at u/s of the Tato-I Power House	Under Civil Contractor's Scope
3.	Approach Road from the left abutment of the bridge at d/s of the Tato-I Weir to the Tato-I HRT Intake	Under Civil Contractor's Scope
4.	Approach Road from the Left Abutment of the Bridge at u/s of the Tato-I Power House to the Tato-I Power House	Under Civil Contractor's Scope
5.	Approach Road from the Left Abutment of the Bridge at u/s of the Tato-I Power House to the Adit-1	Under Civil Contractor's Scope
6.	Approach Road from the Adit-I Road to Surge Shaft	Under Civil Contractor's Scope
7.	Approach Road from the Adit-I Road to Valve House	Under Civil Contractor's Scope

BOUNDARIES

EAST : *YARJEP RIVER NEAR HEYO AND TATO VILLAGE LANDS*

WEST : *YARJEP RIVER NEAR GAPO TO MENYING VILLAGE LANDS*

NORTH : *MENYING TO HEYO VILLAGE LANDS*

SOUTH : *BRO ROAD AND GAPO TO TATO VILLAGE LANDS*

COMPONENT WISE LAND ACQUIRED BY NEEPCO FOR TATO - I HEP (186MW)

SI.NO.	ITEM	SURFACE LAND (Ha)	RIVER BED (Ha)	TOTAL
1	Submergence Area	1.2	1.8	3.0
2	Intake Complex Area	8.2	0.5	8.7
3	Intake Muck Disposal Area	3.2	0.0	3.2
4	Intake Storage,Office and Colony Area	1.7	0.0	1.7
5	Intake Quarry Site	0.3	0.0	0.3
6	PH Area	8.8	0.0	8.8
7	PH Muck Disposal Area	3.2	0.0	3.2
8	PH Storage,Office and Colony Area	1.4	0.0	1.4
9	PH Quarry Site	0.5	0.0	0.5
10	PH Access Road (NOT PROPOSED TO BE CONSTRUCTED)	10.7	0.0	10.7
11	ADIT Area	1.9	0.0	1.9
12	ADIT Access Road	6.6	0.0	6.6
	TOTAL TATO - I	**47.7**	**2.3**	**50.0**

Colony and Storage Area for Tato-I HEP (186 MW)

Sl No	Zone	Particulars	Area (Ha)			
			Civil	HM	EM	Total
1.	Zone 4	Intake Storage office and colony area	1.2*	0.8	_	2
2.	Zone 8	PH Storage, Office and Colony Area	_	_	1.4	1.4
		Extra Land from Tato-II HEPs acquired land				
1.	A	Colony Area and Storage	_	0.7	_	0.7
2.	B	Colony Area and Storage	0.9	_	_	0.9
		Total	2.1	1.5	1.4	5.0
						Grand Total Area for Colony and Storage: 5.0 Ha

* 0.3 Ha has been considered from Heo HEP (240 MW)

Note : Bridge Locations denoted by B3,B4 & B5

PROJECT LAND ZONE LAYOUT : TATO-I HEP