

**Pre Bid Technical Clarification No.4 dated 17.04.2025 to NIB No.475 dtd 21.01.2025 for EM Works of 186MW Tato-I HEP**

Sr. No.	Volume	Clause No.	Clause name	Page No.	Specification as per Bid Document	Bidder Query / Clarification	NEEPCO Replies
<b>Hydraulics</b>							
1	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.2.4.1	1.2.4.1 Cavitation guarantee	8 of 57	If excessive cavitation pitting occurs, the Contractor shall repair the resulting damage during the turbine guarantee period. All areas where the depth of pitting exceeds 1 mm shall be restored to their original contours by welding with stainless steel and grinding to a smooth surface equal in finish to the adjacent undamaged areas. The Turbine after such modifications, repairs and replacements shall be subject to same cavitation guarantees as per the original equipment.	Any revolving cavitation guarantee shall not be offered. In case of excessive cavitation pitting and after modification/ repair/ replacment, cavitation guarantee shall be extended by 12 months from the time such replacement/repair subject to maximum time period of thirty-six (36) months from the date of putting plant and equipment into operation as restoration of original guarantee conditions each time after repair/replacement will lead to an unending process.  We request you to review the requirement and accept our above proposal.	Bid stipulation shall prevail
2	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.2.5.1	1.2.5.1 Smooth, Stable & Quiet Operation and Noise Limit	9 of 57	The peak to peak pressure pulsations at any of the taps to be provided below the runner shall not exceed 3% of the rated net head.	Considering the project paramters and project specific speed range, the pressure pulsation requirement is stringent. We propose to modify the pressure pulsation requirement as follows:  <b>"The peak pressure pulsations at any of the 4 taps located below the runner shall not exceed 3 % (6% peak to peak) of the rated net head at rated Power."</b> <b>This is as per general practice of all hydro projects and reference can be drawn to many PSU projects.</b> This is very critical and hence request you to Kindly review and accept.	Bid stipulation shall prevail
3	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.2.5.1	1.2.5.1 Smooth, Stable & Quiet Operation and Noise Limit	9 of 57	The peak to peak power pulsations shall not exceed 1% of the rated power ignoring any isolated sharp peaks.	Considering the project parameters and project specific speed range, the power pulsation requirement is stringent. We propose to modify the power pulsation requirement as follows: "The peak to peak power pulsations shall not exceed 2% of the rated power ignoring any isolated sharp peaks." As per hydro market practice, this value generally in the range of 1.5%-2%. This is very critical and hence request you to Kindly review and accept.	Bid stipulation shall prevail
4	Volume II, Sec-II, Sub-Sec-02 Generator and Excitation System	2.3.4	2.3.4 Technical Parameters	6 of 71	15. Runaway speed : Not more than 180% of rated speed	Runaway speed is outcome of hydraulic solution and transient analysis. Hence, we kindly request to allow the bidders to define the maximum runaway speed based on the selected solution. Accordingly E&M equipment shall be designed. We have done preliminary calculation as per which runaway speed is expected to be higher than 180% of rated speed. Kindly review the requirement and accept.	If the Pressure rise and speed rise permissible limit is maintained along with WR2/GD2 or Inertia constant requirement, slight variation in runaway speed as a outcome of Model Test / transient analysis can be permitted. This shall supersede our reply SI no. 25 of Pre-bid Technical Clarification no. 2

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<b>Turbine</b>							
1	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.2.4.2	1.2.4.2 Limit on Erosion By Silt:	8 of 57	Limit on Erosion By Silt: With the silt of the given characteristics & quantity suspended in the waters going to the turbines, the abrasion resistance of the under water parts including runner of the turbine shall be such that interval between erosion maintenance shall not be less than 12000 hrs of operation.	The interval between erosion maintenance shall be decided during detail Engineering after study of the detailed water petrographic analysis report. Please review the requirement and confirm.	Bid stipulation shall prevail
2	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.4.5	1.4.5 Spiral Case	27 of 57	1.4.5.3 The embedding of spiral casing in concrete is proposed to be carried out with the spiral casing under a hydraulic pressure equal to the maximum operating head including water hammer.	Embedment hydraulic pressure during spiral casing concreting is generally 50%-60% of rated head. It seems the requirement of " pressure equal to the maximum operating head including water hammer" is mentioned by error in this clause. Such requirement is generally asked for test of the Spiral. Actual requirement of Embedment hydraulic pressur shall be finalised during detailed engineering. Please review the requirement and confirm.	Shall be finalised during detailed engineering. This shall supersede our reply SI no. 99 of Pre-bid Technical Clarification no.1.
3	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.13	1.13 Inspection and Testing at Site	56 of 57	g) The machine shall be designed to withstand the runaway speed test for 15 minutes. Runway speed test is envisaged to be carried out on completely assembled turbine generators at site by the Contractor, at the discretion of the Employer. In case of failure, the Contractor shall rectify the damage and inherent defects and make such modifications as well make the turbines capable of withstanding the designed "Runway Speed". The Contractor shall demonstrate the same by conducting this test again.	Please appreciate that runaway speed test is destructive in nature and not performed at site as it requires not only the complete inspection of the Power Unit but may also cause adverse impact on the foundation of the machine and civil structure. However Power Unit would be designed to withstand the runaway speed for the agreed duration. Please review the requirement and confirm.	Bid stipulation shall prevail. However, final decision regarding conducting of Runaway speed test shall be taken during detailed engineering stage.

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<b>Generator</b>							
1	Volume II, Sec-II, Sub-Sec-02 Generator and Excitation System	2.3.4, 2.3.7.1, 2.3.7.9	2.3.4 Technical Parameters 2.3.7.1 General 2.3.7.9 Thrust & Guide Bearings	5, 12 & 21 of 74	<p>-Type: Salient Pole / Suspended Vertical shaft type synchronous generator.....</p> <p>The generator shall be suspended type equipped with one suitable combined thrust bearing and guide bearing located above the rotor, and one guide bearing below the rotor.....</p> <p>The generator coupled to francis turbine shall be suspended type i.e. with the thrust and upper guide bearings located above the rotor and lower guide bearing below the rotor.....</p>	<p>For machines with rated speed of 300 rpm of similar capacity, it is preferable to have construction semi-umbrella type (as per IEC 60034-7) IM 8225.</p> <p>Main advantages for this type of construction are:</p> <ul style="list-style-type: none"> <li>- The thrust load gets transferred directly to concrete</li> <li>- Maintenance friendly</li> <li>- Better power unit stability due to combined thrust &amp; guide bearing in center of power unit</li> </ul> <p>Same design is also used in your Khandong HEP and Kameng HEP.</p> <p>Please allow bidder to choose the type of generator construction type as per their best practice.</p>	Bid stipulation shall prevail.
2	Volume II, Sec-II, Sub-Sec-02 Generator and Excitation System	2.3.7.10	2.3.7.10 High pressure lubrication oil system	23 of 74	For bearing lubrication, machine or turbine oil of viscosity class VG100 shall be used.	<p>Considering the project elevation (&gt;1000 m), turbine type, power unit capacity and speed, we recommend to use VG46 oil grade for complete power plant. Please note that high oil viscosity grade may create problem during the winter period or after long shut down of units. With lower viscosity oils (e.g. VG46), bearing losses shall be lower and thereby improving the efficiency of the unit. In general VG46 is used for hydro application.</p> <p>Please allow bidder to choose the oil grade as per their best practice.</p>	<p>Shall be decided during detailed engineering.</p> <p>This shall supersede our reply SI no. 75 &amp; 106 of Pre-bid Technical Clarification no. 2.</p>
<b>BOPE</b>							
1	Volume II, Sec- II, Sub-Sec-06, Isolated Phase Bus Duct & Associated Equipment	6.5.2	Temperature Rise Characteristics	5	The enclosure temperature rise shall not in any case exceed 25 °C	<p>Kindly accept the temperature rise of the IPBD enclosure as per IEEE C37.23 which is limited to 40°C. Generally, all reputed suppliers design the IPBD as per IEEE standrad and type tested design is also in line with IEEE.</p> <p>We request again to review the requirement and confirm.</p>	<p>It shall comply with the latest IEEE/IS Standards.</p> <p>This shall supersede our reply SI no. 1 of Pre-bid Technical Clarification no. 1.</p>
2	Volume II, Sec- II, Sub-Sec-06, Isolated Phase Bus Duct & Associated Equipment	6.5.4	Isolated Phase Bus Duct	5	Isolated phase bus conductors shall be of aluminum alloy and mounted on porcelain insulators;	<p>Most of the reputed suppliers are providing epoxy resin insuators instead of porcelain type which are already proven design. Porcelain type insulator may not be provided by many of the reputed suppliers as per current manufacturing practice.</p> <p>Kindly accept the same.</p>	<p>Agreed.</p> <p>This shall supersede our reply SI no. 109 of Pre-bid Technical Clarification no.2</p>

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3	Volume II, Sec-II, Sub-Sec-10, Transformers	10.1	Scope of Work (Generator Step-up Transformers)	1	The Scope of Work under this section covers the detailed requirements for design, manufacture, Quality assurance, .....	It is understood that the rails for the Transformers shall be in the scope of civil contractor.  Kindly confirm the same.	Confirmed
4	Volume II, Sec- II, Sub-Sec-26, Gas Insulated Switchgear & Gas Insulated Bus Duct	26.4	Rating and Technical Data	6	Short-time withstand current 50 kA Rated peak withstand current (peak value) 135 kA	The specified value of rated peak withstand current seems to be incorrect for the 50 kA short time withstand current. As per IEC 62271, the rated peak withstand current should be 2.5 times of the short time withstand current i.e. 125 kA.  Kindly accept the same.	Shall be reviewed during detailed engineering.
5	Volume II, Sec- II, Sub-Sec-26, Gas Insulated Switchgear & Gas Insulated Bus Duct	26.13	Support Structures, Ladders and Walkways	13	• All supporting structures necessary for the support of the GIS equipment including associated parts as anchor bolts, beams, wall / floors, etc. shall be supplied;	The walls and floors mentioned shall be a part of civil contractor's scope.  Kindly accept the same.	Only masonry work (civil) shall be a part of civil contractor's scope.
6	Volume II, Sec- II, Sub-Sec-26, Gas Insulated Switchgear & Gas Insulated Bus Duct	26.17	Circuit Breakers	17	The circuit-breakers shall be provided with at least two trip coils and two closing coils. Provisions for manual emergency operation must be made.	The reputed suppliers have the standard type tested design with two nos. of trip coils and one no. of closing coil for circuit breakers of GIS. Reputed suppliers may not agree to customise the design. Same shall be reviewed during detailed engineering.  Kindly review and accept the same.	Shall be reviewed during detailed engineering.
7	Volume II, Sec- II, Sub-Sec-28, PLCC System	28.2.3	Proposed Arrangement	4	The Bidder shall complete the computer studies wherever required and submit the frequency plan and optimum coupling details within a period of one month from the date of receipt of above data. The cost of doing the computer studies wherever required shall be included in the lump sum bid price and details of computer study charges shall be indicated. Bidder must indicate the links on which computer study is required.	The frequency bandwidth shall be allocated by NEEPCO, however the PLCC shall be tuned by EM contractor.  Kindly confirm.	Frequency bandwidth shall be allocated by NEEPCO. However, Bidder shall be fully responsible for the coordination required with concerned statutory authority for finalising the frequency plan.
8	Volume II, Sec-III, Schedule of Requirements (SOR)  Bid Document Vol-I, Sec-VII, Price-Schedules	20.1 & 17.05	33kV TRANSMISSION LINE	23 & 21	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	You shall certainly agree that Tato I HEP has a separate package for 220 kV transmission line and it is always preferable to include the 33 kV transmission line in that package instead of including it in E&M scope. their scope Moreover, E&M contractors are not experienced to take the responsibility of right -of- way, survey, clearance and significant civil work. On the contrary, Transmission line package contractor are well experienced in the same.  Hence, it is requested to kindly exclude the 33 kV Line, ADSS and street lighting as mentioned in the clause from the scope of E&M contractor and include the same in main package of transmission line contractor.	Shall be as per Tech specs
<b>BOPM</b>							
1	Volume II, Sec-II, Sub-Sec-01, Turbines, Governors and Main Inlet Valve	1.6 /1.6.1.13	Turbine Main Inlet Valves	43 of 57	One emergency D.C. pump, for black start, complete with motor shall be supplied.	Bidder propose to use Hand pump instead of D.C. Pump, due to larger size of D.C motor, please accept.	As per Tech specs, however requirement can be reviewed during detail engg.
2	Volume II Sec- II, Sub-Sec- 03, Cooling Water System	3.1	Scope of work	1	As well as, supply of sufficient quantity of water for Air Handling Units of the HVAC System and Fire Water Storage Tank.	Bidder propose to use separate pump for fire fighting system, as additional source of electricity shall be required in case of fire, please accept.	Shall be reviewed during detailed engineering.
3	Volume II, Sec- II, Sub-Sec-21, Electric Lifts and Elevators	21.1.1	Scope of works	1	This Section covers two elevator and associated equipment required for the powerhouse.	Please confirm the quantity of elevators, as only one elevator pit is shown in the Power house layout drawing W.003159-20716-EMD-7202 at grid D-8.	There is only one elevator.