Pre Bid Technical Clarification No.1 dtd 09.02.2026 to NIB No.486 dtd 08.01.2026 for EPC execution of EM Works of 186MW Tato-I HEP.						
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1	**Volume II Section-III**	**4**	**2**	r) HVAC System for Powerhouse	Bidder undestand that HVAC system for GIS Hall and Pot Head yard is not in scope of Bidder. If HVAC system is Bidders scope then, Purchaser needs to provide Heat Load Data at tender stage for design and Estimation purpose.	**Both GIS hall and Transformer hall are included in the scope of HVAC system, the heat load to be calculated accordingly by the bidder.**
2	**Volume II Section-III**	**4**	**2**	u) EOT crane of 10 T capacity for erection and maintenance of GIS equipment. The crane shall be capable of lifting equipment from the rails of transformer enclosure.	It is proposed to delete **EOT crane for GIS** from TBG scope since the main GIS supply is not part of Tender. It is not feasible to mobilise erection team especially for EOT crane for GIS.	**Bid stipulations shall prevail.**
3	**Volume II Section-III**	**8**	**5.3**	Gas Insulated Switchgear room AC Distribution Board (GIS-ACDB)	It is proposed to delete **Gas Insulated Switchgear room AC Distribution Board (GIS-ACDB)** from bidder scope since the main **GIS supply** is not part of Tender. AC & DC Feeder Details are not available in Tender Drawing of Boards, hence It is not feasible to estimate the competitive cost . The AC & DC Boards for GIS should be part of GIS Package.	**Bid stipulations shall prevail.**
4		**16**	**10.5**	Two (2) 220V GIS DC Distribution Board (DCDB)		
5	**Volume II Section-III**	**12**	**7.4**	GIS Protection Board (LPB):	It is proposed to delete GIS Protection Board from Bidder scope. It is will require considerable amount of interface details from GIS supplier. Since the main GIS supply is not part of Tender. hence, It is not feasible to estimate the competitive cost . The GIS Protection Board for GIS should be part of GIS Package to reduce interfacing issues.	**Bid stipulations shall prevail.**
6	**Volume II Section-III**	**13**	**7.5**	Bus Protection containing: (BPB)	It is proposed to delete **Bus Protection containing: (BPB)** from Bidder scope. It is will require considerable amount of interface details from GIS supplier. Since the main GIS supply is not part of Tender. hence, It is not feasible to estimate the competitive cost . The **Bus Protection containing: (BPB)** for GIS should be part of GIS Package o reduce interfacing issues.	**Bid stipulations shall prevail.**
7	**Volume II Section-III**	**14**	**7.7**	Line Metering Board	It is proposed to delete Line Metering Board from Bidder scope. It is will require considerable amount of interface details from GIS supplier. Since the main GIS supply is not part of Tender. hence, It is not feasible to estimate the competitive cost . The Line Metering Board for GIS should be part of GIS Package to reduce interfacing issues.	**Bid stipulations shall prevail.**
8	**Volume II Section-III**	**14**	**7.8**	Common RTU Board	It is proposed to delete Common RTU Board from Bidder scope. It is will require considerable amount of interface details from GIS supplier. Since the main GIS supply is not part of Tender. hence, It is not feasible to estimate the competitive cost . The Common RTU Board for GIS should be part of GIS Package to reduce interfacing issues.	**Bid stipulations shall prevail.**
9	**Volume II Section-III**	**14**	**7.9**	GIS and Pot Head Yard Protection Engineering Workstation as per Technical Specifications	It is proposed to delete GIS and Pot Head Yard Protection Engineering Workstation as per Technical Specifications from bidder scope. It is will require considerable amount of interface details from GIS supplier. Since the main GIS supply is not part of Tender. hence, It is not feasible to estimate the competitive cost . The GIS and Pot Head Yard Protection Engineering Workstation as per Technical Specifications for GIS should be part of GIS Package to reduce interfacing issues.	**Bid stipulations shall prevail.**
10	**Volume II Section-III**	**14**	**7.10**	Portable Engineering Work Station as per Technical Specifications	It is proposed to delete Portable Engineering Work Station as per Technical Specifications from Bidder scope. It is will require considerable amount of interface details from GIS supplier. Since the main GIS supply is not part of Tender. hence, It is not feasible to estimate the competitive cost . Portable Engineering Work Station for GIS should be part of GIS Package to reduce interfacing issues.	**Bid stipulations shall prevail.**
11	**Volume II Section-III**	**14**	**7.11**	Protection Operating Work Station as per Technical Specifications	It is proposed to delete Protection Operating Work Station as per Technical Specifications from Bidder scope. It is will require considerable amount of interface details from GIS supplier. Since the main GIS supply is not part of Tender. hence, It is not feasible to estimate the competitive cost . The Protection Operating Work Station as per Technical Specifications for GIS should be part of GIS Package o reduce interfacing issues.	**Bid stipulations shall prevail.**
12	**Volume II Section-III**	**17**	**11.3**	LT Power Cables: 1100 V grade, multi-core, HR PVC/XLPE insulated, PVC sheathed (inner and outer extruded), stranded compacted circular cross-section, FRLS Type, rodent proof, copper conductor of different sizes.	Bidder understand that **LT POWER & Control Cable** connecting either one end or both ends to GIS equipments/POT head Yard Equipment's are not in scope of Bidder. The Cabling/Tray system of GIS should be part of GIS package to avoid interface issues and optimised quantity estimation.	**Please refer Clause no. 13.1 of PTS (Vol-II, Sec-II, Sub sec-13) for detail scope.**
13	**Volume II Section-III**	**17**	**11.4**	Control Cables: Control Cables - 1100 V grade, stranded copper conductor, PVC insulated, FRLS Type, rodent proof, colour coded with inner sheathed extruded PVC over all PVC sheathed of different sizes and cores.	Bidder understand that **LT POWER & Control Cable** connecting either one end or both ends to GIS equipment's/POT head Yard Equipment's are not in scope of Bidder. The Cabling/Tray system of GIS should be part of GIS package to avoid interface issues and optimised quantity estimation.	**Shall be in the Bidder's scope.** **Please refer Clause no. 13.1 of PTS (Vol-II, Sec-II, Sub sec-13) for detail scope.**

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14	**Volume II Section-III**	**17**	11.6	Cable Accessories: Termination Kits, Lugs (tinned copper Lugs), Glands, Ferrules etc.	Bidder understand that **LT POWER & Control Cable** connecting either one end or both ends to GIS equipments/POT head Yard Equipments are not in scope of Bidder. The Cabling/Tray system of GIS should be part of GIS package to avoid interface issues and optimised quantity estimation.	**Bid stipulations shall prevail. Cable accessories shall be in the scope of the bidder.**
15	**Volume II Section-III**	17	12	CABLE TRAYS	Bidder understand that **LT POWER & Control Cable** connecting either one end or both ends to GIS equipments/POT head Yard Equipments are not in scope of Bidder. The Cabling/Tray system of GIS should be part of GIS package to avoid interface issues and optimised quantity estimation.	**Shall be in the Bidder's scope. Please refer Clause no. 14.1 of PTS (Vol-II, Sec-II, Sub sec-14) for detail scope.**
16	**Volume II Section-III**	17	13.1	Illumination System (Normal & Emergency) for Power House area, outdoor areas around power house, pothead yard area, approach road and remote sites (HRT intake & Valve house areas), complete with LED lighting fixtures, conduits and fittings, cabling and distribution boards (MLDBs & ELDBs, LDBs). It shall also include illumination of road near Power House & the two remote sites.	Bidder understand that **Illumination System GIS Hall** are not in scope of Bidder. Please confirm.	**Shall be in the Bidder's scope. Please refer Clause no. 17.1 of PTS (Vol-II, Sec-II, Sub sec-17) for detail scope.**
17	**Volume II Section-III**	17	13.1	Illumination System (Normal & Emergency) for Power House area, outdoor areas around power house, pothead yard area, approach road and remote sites (HRT intake & Valve house areas), complete with LED lighting fixtures, conduits and fittings, cabling and distribution boards (MLDBs & ELDBs, LDBs). It shall also include illumination of road near Power House & the two remote sites.	It is proposed to delete **Illumination System of PHY** from TBG scope since the main Illumination System of GIS Hall supply is not part of Tender. It is not feasible to Procure & mobilised erection team from TBG for such small Package.	**Bid stipulations shall prevail.**
18	**Volume II Section-III**	18	14.1	Earthing System for Power house, transformer area, GIS, Pothead yard area, remote areas/sites and adjoining areas including MS rods for buried earthing grid, GI strip for equipment connection to Main Grid and GI exposed earth strip, MS rods including hardware such as bolts, nuts and lock-washers.	It is proposed to delete the Earthing System for GIS and Pothead yard area as the main GIS and Pothead Yard Equipments are excluded from current scope.	**Bid stipulations shall prevail.**
19	**Volume II Section-III**	18	14.2	Earthing and Surge protection of GIS & other equipment- • Earthing Grid for GIS in GIS floor • Earthing interconnection of GIS equipment and the GIS floor grid. • Connection between GIS floor earth grid with Power House Earth grid	Bidder understand insulation coordination is not in current scope as same is under GIS supplier scope.	**Bid stipulations shall prevail.**
20	**Volume II Section-I GTS**	8 of 125	0.2	Scope of Work:- Exclusions : The following item/ services shall be excluded from present scope of works : • Civil works as detailed in clause no. 10 of this specification, • 220kV Transmission lines.	Bidder understand the scope mentioned Volume II Section III Particular Technical Specifications- Schedule of Requirements (SOR) are only under current scope, rest are under exclusion. Please confirm. Or else mention all items under exclusion.	**Bid stipulations shall prevail.**
21	**Volume II Section-III**	1	1	.....Any item of supply not explicitly listed but otherwise either evident by the contents of the specifications or essential for smooth operation of the equipment shall be construed as forming part of the supply and no additional charges shall be payable for the same.....	In the interest of project transparency, the Owner should explicitly define all exclusions. Clearly documenting these items will mitigate risks of dispute concerning the boundary between excluded equipment and components essential for operational continuity	**Bid stipulations shall prevail.**
22	**Volume II Section-III**	1	1	The scope of supplies and services shall be as per various clauses in the different volumes of this Package and the tenderer shall be responsible to ensure completeness of supplies and services even though these are not fully covered in this volume.	The Bidder acknowledges that the proposed services pertain exclusively to equipment defined within the Bidder's scope of supply. It is understood that equipment outside of this defined scope is not the responsibility of the Bidder. Please confirm.	**Bid stipulations shall prevail.**
23	**General**			General	We request that the Owner establish a formal Order of Precedence for the tender package. Clearly identifying the hierarchy of documents (e.g., Special Conditions, Technical Specifications, Drawings) is necessary to avoid ambiguity during the execution phase	**Refer to Clause No. 2.4 of Section- IV, General Conditions of Contract (GCC) of Bid Document.**

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24	General			General	Bidder understand Erection Testing & Commissioning scope will be applicable for bidder supplied items only. Please confirm.	**Confirmed.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
25	Volume II Section-II	Page 44 of 70	1.4.19	**Vibration monitoring system:** One (1) no. of common vibration monitor shall be supplied for monitoring the vibration level of Generator as well as Turbine points at a single location. All the vibration sensors of Turbine & Generator points shall be connected to this common vibration monitor.	One (1) for turbine and generator of one unit (1 for each unit) or Turbine and generator of all 3 units (1 for all 3 units). Kindly Confirm	**Common for all 3. However, the bidder may offer separate sets for each TG unit as per their standard design.**
26	Volume II Section-II	Page 46 of 72	2.4 2.4.2.5	Static Excitation System: The excitation equipment shall comprise of Excitation power transformer, thyristor rectifier banks, filter circuits, field circuit breaker with discharge resistor, field flashing controls, dual channel hot redundant automatic and one manual channel voltage regulator Automatic Voltage Regulator (2A + 1M))	We offer dual redundancy for manual channel also and offer 2 auto channel with inbuilt manual channels. This is as per current industry trends and all recently supplied systems by Bidder. Kinldy Confirm.	**Agreed.** **The excitation system shall be provided with 2 (two) auto channels (Auto-I and Auto-II) for automatic voltage regulation, excitation control and indication. Each channel shall be equipped for auto operation with facility of selecting either channel in "Auto" or "Manual" mode.**
27	Volume II Section-II	Page 3 of 108	7.1	7.1 SCOPE The scope covers the detailed requirements for the design, manufacture, factory testing, transport, delivery, installation, site testing and commissioning of the Unit Control, SCADA and Automation hot redundant systems including all associated equipment and cabling including integration of the electrical and mechanical equipment for their monitoring and control from the main SCADA in the powerhouse control room. Included in the scope is the integration of monitoring and controls of the equipment at remote sites (viz. the Intake area, Valve house, Heo PH etc.) from the Powerhouse control room SCADA.	Distance for OFC cable laying between control room and remote location(s) PLs reply	**Since site survey is under the scope of the bidder, the required cable route length shall be assesssed by the bidder during site visit and lay out drawings provided. However, the distance between the power house and intake shall be approximately 5KM.**
28	lume II Section	Page 4 of 108	7.1	Based on above, the Heo Control room will be designed as master control room for both Heo & Tato-I and will exercise overall/Master control on the Tato-I units. Any tripping/non-operation of a unit at Heo plant will ensure that the corresponding unit at Tato-I also two stations, two nos. Optical fibre cable (OFC) between the two stations has been included in the scope of this package. Separate fibres of both the FO cables will also be used to provide redundancy for the communication link. The DCS/SCADA system for the two stations will be designed satisfying the above requirements for both remote and local modes. All equipment and components required to complete the above-mentioned work, including integration with the Heo HEP, shall be supplied, installed, tested,	1. Whether OFC between HEO HEP and Tato-I HEP will be laid over groung , underground or alongside the tail race tunnel? Please clarify. 2. Tanden operation requires logic modification, additional hardwares etc. in the existing/Upcoming DCS/SCADA system of HEO-I HEP. The same can only be done by the OEM of the above SCADA system. Employer to assign this work to HEO-I HEP SCADA OEM during execution. Please confirm.	**1. OFC shall be laid overground. The route shall be finalised during detailed engineering.** **2. Please refer Clause no. 7.1 (Scope of Unit Control, SCADA, Automation & Communication). All necessary configuration / interface protocol must be met.**
29	Volume II Section-II	Page 20 of 108	7.3.2	**Copyrights and Software Licenses:** The Contractor shall submit a full copy of the application software updates once a month until the warranty period expires to the Employer and / or its designee to be kept in case of force major events or bankruptcy of the Contractor.	Application software updates shall be provded quarterly as per industry norms for a period of 12 months or till warranty expires (whichever is earlier) Please confirm.	**Accepted.**
30	Volume II Section-II	Page 24 of 108	7.3.5	Design Requirements: f. The PCS shall include as a minimum the following subsystems (per Unit): 2. One Unit Control Station including the Operator Work Station, the server, a dedicated large-scale video display screen as shown on the PCS block diagram;	This clause is asking for a seperate server for all units. Pls confirm if One (common) EWS is required for all 3 units or each unit needs to heva its own separate EWS. Pls Reply	**Engineering Work Station- 1 no.** **Portable EWS- 1 no.**

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31	**Volume II Section-II**	**Page 18 of 108**	**7.3.1**	Components Details: f. Control Room: Control Room top quality Heavy Duty furniture including desks, tables, **stands, cabinetry** and chairs. The furniture shall include accommodation for Work Stations and equipment provided **herein and by others** including: the Operator Work Stations c / w 2-22" screens (OWS1,2,3), the Large Video Screen Work Station (LVSWS), the Historian Work Station (HWS), the SCADA Engineering Work Stations (EWS1,2), the Energy Management Work Station (EMS), **the Zoom Processor Vibration Analysis Work Station (ZCS)**, the closed circuit TV Work Station c / w 2-22" screens (CCTV), the three desktop printers c / w routers, Voice over IP (VoIP) Router Cabinet and filing cabinetry in the location shown on the arrangement drawing;	1. Details of stands, cabinetry shall be required 2. Deatails of Other equipments shall be listed (Desk/Table/cabinet with dimension) 3. The Zoom Processor Vibration Analysis Work Station (ZCS): Kinldy explain this system and furniture requirement details	**To be decided during detailed engineering.**
32	**Volume II Section-II**	**Page 31 of 108**	**7.3.6.1 13(b) iii**	Operator Workstations (OWS): **IEEE1394 port;** Dedicated Video Card with two (2) HDMI and one (1) DVI ports to support 1920x1200 resolution; The two (2) HDMI ports on the video card shall be used for dual monitor setup and the DVI port for the Large Monitor (2 x 2 video matrix).	1. IEEE1394 port is a very uncommon port and is not used for any application. Suitable converters shall be supplied. Kinldy Confirm 2. OEM recommended NVidia T400 or latest PCI-Express Dual Output Graphics card with full 16X support, with minimum 4 GB RAM, supporting 1920 x 1200 resolution with true colors with mDP to DP adapters – 2 nos, shall be inbuilt part of WS/EWS. 3. Necesary miniDP to DVI/HDMI converters shall be provided in place of inbuild HDMI/DVI port. Kinldy confirm	**To be decided during detailed engineering.**
33	**Volume II Section-II**	**3 of 108**	**7.1**	An Optic Fiber communication system between the Control Room and the remote locations. The Fiber Optic cable shall be supplied and laid under this package and shall be terminated, tested and commissioned by the Contractor;	1. Kindly furnish the following distance: a. Between Tato-1 Power House to Intake area b. Between Tato-1 Power house to Valve house area. c. Between Heo Power house to Tato-1 power house. 2. Please inform the Method of laying (i.e. buried underground/ overhead by pole) OFC between Power House to Dam Building. 3. We understand that the OFC cable between Power House to Barrage /Dam Building shall be direct buried & steel pole for Overhead OFC cable is not applicable & not required. Kindly confirm acceptance.	**Please refer to our reply to query no. 3and 4 above.**
34	**Volume II Section-II**	**6 of 43**	**11.4**	Each DC distribution board shall comprise motor operated molded type circuit breakers	We understand that Motor operated MCCBs are required only for incomer breaker of main & Sub DCDBs. For outgoing breakers of Various DCDBs & sub-DCDBs manual operated MCCB's shall be required. Kindly confirm the understanding.	**confirmed.**

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35	Volume II Section-II	20 of 43	11.8.5	Each cell and the complete battery shall be subjected to the following acceptance tests In accordance with relevant standards in presence of the Purchaser's representative. i. Test for capacities of individual cells and complete battery; ii. Dimensional checking of plates; iii. Visual inspection; iv. Endurance Test.	Factory acceptance test shall be carried out on sampling plan (2 cells per lot). It is not recommended or possible to test each & every cell during Factory acceptance test. Also endurance test (type test) is carried out on Prototype cell. Type test Reports for the same shall be submitted during document approval as per Applicable IS. Kindly confirm.	**Bid stipulations shall prevail. However, the bidder may optimize during detailed design after approval of employer.**
36	Volume II Section-II	21 of 43	11.8.5	Type test The batteries shall have been type tested to meet the performance requirements for design and AH rating of cells as per IEC standard certified copies of the test reports for the following type tests shall be supplied for the approval of the Purchase	Type test reports for tests as per IS 1652 for Plante batteries & IS 10918 for Ni-cd batteries can be submitted for customer approval. It shall not be possible to arrange test reports for various tests not listed in applicable IS for Plante/NI-cd batteries. Kindly confirm.	**Bid stipulations shall prevail.**
37	Volume II Section-II	25 of 43	11.11	DC Application Nominal Voltage : 220 V DC or 48 V DC Duty : Continuous Continuous Current Rating : As required No. of Poles : 2 Ultimate and Service Breaking Capacity : 35kA for 220 VDC and 20 kA for 48V DC Aux. contacts for ON and TRIP : Required (2 NO and 2 NC contacts) Door operating handle : Required	For DC application Short circuit rating of MCCBs (35kA for 1 Sec) is on very higher side. Same should be 10kA for 1 sec for O/G feeders. Kindly confirm.	**Bid stipulations shall prevail.**
38	Volume II Section-II	26 of 43	11.12.1	Some instruments and communication equipment at remote site require a 24 V DC source, in this case the Contractor is responsible to install the 240 V AC / 24 V DC converter and 24 V DC distribution board to ensure a stable and reliable power source to the aforementioned devices	24V DC power supply requirement for various instruments and communication equipment covered in this contract shall be taken care at our end. However, if 24V DC supply is required for Items not part of this contract, Converter/DCDB for the same shall not be in bidder scope. If same is required, details for the same to be shared. Kindly confirm.	**Bid stipulations shall prevail.**
39	Volume II Section-II	28,29,30 of 43	11.12.3.3	Display and Controls	Display of controls in Inverter can only be provided as per standard design of inverter manufacturer. Parameters like Battery voltage, Battery charger/discharge current, etc are not applicable for inverter powered by 220V DCDB. Please accept.	**Bid stipulations shall prevail.**
40	Volume II Section-II	36 of 43	11.16	Input voltage tolerance +10 %, -15%	As per standard practice of various manufacturers of inverter/UPS, input voltage variation is allowed+10 %, -10% only. Please accept.	**Bid stipulations shall prevail.**
41	Volume II Section-II	6 of 43	11.4	Each DC distribution board shall comprise motor operated molded type circuit breakers	We understand that Motor operated MCCBs are required only for incomer breaker of main & Sub DCDBs. For outgoing breakers of Various DCDBs & sub-DCDBs manual operated MCCB's shall be required.	**Confirmed.**
42	Volume II Section-II	3 of 28	12.1.1	200 kVA, 50 Hz alternator with exciter, automatic voltage regulator etc. for installation at intake location.	Please provide the Single Line Diagram (SLD) showing the DG set & its protection, Metering, Breaker associated to downstream 415V Dist. Board (Intake area).	**DG set shall be provided with a standard metering and protection system. However, the loads connected to the associated board are not detailed at this stage of engineering. The bidder may propose the rating of outgoing feeders to accommodate the maximum load**

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43	Volume II Section-II	8 of 28	12.5	The engine shall be capable of delivering an output of 10% in excess of its rated output at its rated speed for a period of one hour in any period of 12 hours consecutive running, without undue heating of the engine or any other mechanical part.	Feasibility of provision for overspeed for a period of an hour in any 12 hours shall be strictly as per standard design of manufacturer. **Kindly confirm acceptance.**	**Bid stipulations shall prevail.**
44	Volume II Section-II	9 of 28	12.6.1.1	Engine starting system shall have electric motor with suitable lead acid battery and static battery charger.	The Type of Battery shall be shall be strictly as per standard design of manufacturer. **Kindly confirm acceptance.**	**confirmed.**
45	Volume II Section-II	10 of 28	12.6.1.2 (ii)	Individual diesel oil day storage tank (day tank) of capacity sufficient to house fuel required for 8 hours of continuous running of DG set at 100% load.	It is proposed that the individual fuel tank/ day fuel Tank shall be 990 Litre for 630KVA DG set & 490 Litre for 200KVA DG Set in line with standard norms. **Kindly confirm acceptance.**	**Accepted.**
46	Volume II Section-II	14 of 28	12.6.1.8	6 nos. RTDs and one anti condensation heater wired to a separate terminal box.	Numbers of RTDs shall be strictly as per standard design of manufacturer. **Kindly confirm acceptance.**	**To be decided during detailed engineering.**
47	Volume II Section-II	18 of 28	12.6.4	Alarm/ Automatic Shutdown	Feasibility of provision for specific arrangement of Alarms System shall be strictly as per standard design of manufacturer. **Kindly confirm acceptance.**	**Bid stipulations shall prevail.**
48	Volume II Section-II	18 of 28	12.6.4	Automatic shutdown shall be under following conditions: Very high engine temperature	We understand that very high engine temperature is "very high water (Water jacket around engine) temperature ". **Kindly clarify and confirm.**	**Confirmed.**
49	Volume II Section-II	18 of 28	12.6.4	Automatic shutdown shall be under following conditions:	Feasibility of provision for high oil temp & Over cranking shall be strictly as per standard design of manufacturer. **Kindly confirm acceptance.**	**Bid stipulations shall prevail.**
50	Volume II Section-II	20 of 28	12.6.5	All protection equipment i.e. reverse power relay & reverse kVAR relays with suitable ranges, frequency relay, under voltage relay, frequency relay, instantaneous and IDMT over current relay, generator differential / REF protection, earth fault relay etc. and any other relays to satisfy the clause "Automatic Shutdown" of this section;	Feasibility of provision for Earth fault protection shall be strictly as per standard design of manufacturer. **Kindly confirm acceptance**	**Bid stipulations shall prevail.**
51	Volume II Section-II	4 of 11	14.3.1	Cable trays shall have standard width of 300 mm, 600 mm & 750 mm and standard lengths of 3.0 meter.	1. Cable tray shall have the standard width of 150mm, 300mm, 450mm and 600mm. Kindly confirm acceptance. 2. As per bidder practice, Standard length of cable cable tray is 2.5Metre. Kindly confirm acceptance.	**To be decided during detailed engineering.**
52	Volume II Section-II	4 of 11	14.3.1	Ladder type trays shall have a rung spacing of 300 mm for power cable application and 150 mm for control and communication cables.	As per bidder standard practice, rung spacing of Ladder type trays shall be 250 mm. Kindly confirm acceptance.	**Accepted.**
53	Volume II Section-II	8 of 11	14.5	Cable shall be terminated using double compression type cable glands.	Double compression type cable gland shall be used only for armoured cable. For unarmoured cable single compression gland is used. Kindly confirm acceptance.	**Bid stipulations shall prevail.**
54	Volume II Section-II	3 of 21	15.4.3.1 c)	Public Address System - Field Handset stations	Please specify the number of field handsets required for price bid purposes so that all the bidders are at par. In case, same has to be decided by bidder, the quantity shall be final and any additional quantity shall have a price implication.	**The major areas covered are specified in the T.S. The bidder may propose the appropriate number of field handsets, loudspeakers, etc., at different locations to ensure complete area coverage**
55	Volume II Section-II	3 of 21	15.1.3 d)	Public Address System - Loudspeakers/ hooters	Please specify the number of outdoor and indoor type loudspeakers required for price bid purposes so that all the bidders are at par. In case, same has to be decided by bidder, the quantity shall be final and only the locations may be decided during detailed engineering. Any additional requirement shall have a price implication.	

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56	**Volume II Section-II**		**Section 15**	Optical Fibre Cables	Please clarify the scope of OFC for integration of all zones for Communication and CCTV System between power house area and intake areas. If it is bidder's scope, kindly specify the type, distance, method of laying etc. for preparation of offer.	**Bid stipulations shall prevail.**
57	**Volume II Section-II**	**3 of 21**	**15.1.3**	CCTV System	Please specify the number of cameras required for price bid purposes so that all the bidders are at par.	**The major areas covered are specified in the T.S. The bidder may propose the appropriate number of CCTV.**
58	**Volume II Section-II**	**3 of 21**	**15.1.3**	Fixed colored cameras with variable focal length lenses;	Type of camera shall be of fixed type. Kindly confirm the same.	**Bid stipulations shall prevail.**
59	**Volume II Section-II**		**Section 15**	Common items	Please provide the quantity of items like monitors, keyboards, personal computers and printers required for price bid purposes.	**To be decided during detailed engineering.**
60	**Volume II Section-II**		**Section 15**	Access Control System	There is no details mentioned for Access Control System in the tender specification. Please confirm that the same in not in the scope of bidder.	**Confirmed.**
61	**Volume II Section-II**	**7 of 12**	**16.7**	After placing the earth mat conductors, the trenches and electrode pits shall be back filled with bentonite clay.	Excavation/ backfilling is not possible for E&M contractor and shall be in the scope of the civil contractor. Customer may please confirm the same.	**Confirmed However the material shall be in the scope of E&M supplier.**
62	**Volume II Section-II**	**4 of 20**	**18.4.1.1**	Digital Multimeters for AC and DC: current :1.5 mA...30 A in several steps;	Standard Current range for multimeter is up to 20 Amp and available with various reputed makes. We request to accept the maximum up to 20 Amp instead of 30A. **Kindly confirm acceptance.**	**Bid stipulations shall prevail.**
63	**Volume II Section-II**	**19 of 20**	**18.4.1.5**	portable type silt measuring instruments	We understand the instrument is portable SILT DENSITY INDEX TEST KIT. **Kindly confirm acceptance.**	**Bid stipulations shall prevail.**
64	**Volume II Section-II**	**19 of 20**	**18.4.1.6**	tool lockers of appropriate size.	The lockers shall be MS sheet made, 600mm (W) x 600mm(D) x 100mm(H). **Kindly confirm acceptance.**	**Bid stipulations shall prevail.**
65	**Volume II Section-II**	**5 of 49**	**10.1**	One (1) outgoing feeder for transformers for remote Sites (intake gates location and Valve house;	No transformers are mentioned in PTS (VOL-II, Section-II) or Schedule of Requirement (VOL-II, Section-III). We understand NO Transformer (including the auxiliary transformers at barrage & valve house site, SAT, SST , UAT etc.) is in scope of Bidder. **Kindly confirm acceptance.**	**Particular Technical Specifications and Schedule of Requirement shall prevail.** **(GT, UAT, SST, SAT, Intake and Valve house transfomers are not in this scope)**
66	**POWER HOUSE UNIT AND SERVICE AUXILIARY SINGLE LINE DIAGRAM**			Tender drawing no.-W.003159-20719-ED-7003	We understand only the following 33KV Cables are required. Kindly furnish the tentative route distance between the following: 1. 220/33kV transformer (SST) to 33kV Power Supply Board (MVSSB)-1 No. 2. 33kV Power Supply Board (MVSSB) to 33/0.433kV, 1.5MVA (SSAT) - 2 No. 3. 33kV Power Supply Board (MVSSB) to Local/ Colony Dist Boards -1 No.	**The following cables shall be required and the distance may be assessed from the layout drawings provided.** **1. 220/33kV transformer (SST) to 33kV Power Supply Board (MVSSB)-1 set. (Double run)** **2. 33kV Power Supply Board (MVSSB) to 33/0.433kV, 1.5MVA (SSAT) - 2 Set.** **3. From 33kV panel to Pole structure near power house for Intake and Valve House power supply through overhead 33 kV line- 1 set.** **4. From Pole structure near Valve House to Valve house transformer- 1 set.** **5. From Pole structure near Intake to Intake transformer- 1 set.**
67	**Volume II Section-II**	**17 of 25**	**17.4.9**	Lighting poles (Octagonal Poles) shall be fabricated from ERW steel tubular pipes of specified section, with joints, swaged together when hot and beveled on outside edges.	Swaged type poles are manufactured from ERW steel tubular pipe. However, Octagonal poles are manufactured from sheet metal. Please clarify.	**Octogonal poles with sheet metal is accepted.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
68	Volume II Section-II	11 of 25	17.3.3	LED lamps shall be provided with screwed (G.E.S) type caps.	We shall provide retrofitted type/ integrated type LED lighting fixture based on degree of protection and area lighting requirement. Please confirm.	**Confirmed**
69	Volume II Section-II	18 of 25	17.4.12	Lighting mast (if required)	Please provide number and precise locations of lighting mast.	**To be decided during detailed engineering. However approximate nos may be calculated based on layout.**
70	Volume II Section-II	19 of 25	17.4.15	All cables shall be copper conductor PVC insulated FRLS.	(i) Cables shall be used only till Lighting panel incoming. Lighting panel outgoing and downstream distribution shall be through wires. Please confirm. (ii) To optimize cost and to reduce risk of thefts, please accept aluminium conductor cables as per standard practice. (iii) Further, please accept multicore cables.	**Bid stipulations shall prevail.**
71	Volume II Section-II	19 of 25	13.1	System (Normal & Emergency) for Power House area, outdoor areas around power house, pothead yard area, approach road and remote sites (HRT intake & Valve house areas), complete with LED lighting fixtures, conduits and fittings, cabling and distribution boards (MLDBs & ELDBs, LDBs). It shall also include illumination of road near Power House & the two remote sites.	It is mentioned that illumination of road near Power House & the two remote sites are included. Please explain clearly about two remote sites.	**Referred clause could not be found.** **For detail scope of Illumination System please refer Section- 17 of PTS.**
72	Volume II Section-II		Section-17	All wires and cables shall be copper conductor (FRLS type cables / wires to be used for indoor areas).	Wires shall be FR type as per industrial practices and previous executed projects by bidder. Please confirm.	**Bid stipulations shall prevail.**
73	Volume II Section-II	4 of 25	17.1.1	Main lighting distribution board (MLDB) with isolation transformer resin encapsulated dry type, 415 / 415 V, 100 KVA (tentative exact capacity to be decided during detailed engineering), Main Essential lighting distribution board (MELDB) with isolation transformer resin encapsulated dry type, 415 / 415 V, 100 KVA (tentative exact capacity to be decided during detailed engineering) lighting distribution boards (LDB), MCB boxes, switch boards, 220 V DC Emergency Lighting Distribution Board (ELDB) etc.	Lighting distribution board would be of single incomer or double incomer. Please confirm.	**Two Incomers shall be provided from two different lighting transformers.**
74	Volume II Section-II	4 of 25	17.1.1	Project Roads marking mentioned in General layout plan.	We understand that Illumination on project roads R-1, R-2, R-3 and R-4 are excluded from Bidder scope. Please confirm. Also, please provide confirmation for illumination on existing road i.e. R-8.	**Illumination on roads R-1, R-2, R-3, R-4 and R-8 are not in the scope.**
75	Volume II Section-II	3 of 20	22.1.4	**Description of Air Conditioning System** The system shall consist of ductable split Air Conditioning units. 5 Nos. of 2 Ton cooling capacity each (4 Nos. working and 1 No. standby) for Control Room shall be provided. All units shall be identical. The evaporating units shall be suspended from the ceiling of the rooms over the false ceiling. The return air shall be collected through return air slits in the false ceiling and taken back to plenum formed above false ceiling. Fresh air in each control room shall be supplied through a tube axial supply air fan, duct and grilles. Condensing units shall be located at El. 1031m. The conditioned air from the evaporating units shall be transported through the diffusers in the control room floor areas.	Due to layout constraint and capacity of AC machine in similar type of project, bidder propose the selection of type AC system as per the following selection, 1. 25-60TR, D-X type Air cooled Condensing Unit along with AHU shall be provided with 3 x 50% redundancy. 2. 11-25 TR, Air cooled Ductable Split AC/ Air cooled Package AC shall be provided with 3 x 50% redundancy. 3. Upto-10TR, with Hi-wall Split AC/ Cassette AC shall be provided with N+1 redundancy configuration. Where N is number of working units. Further to above, relative humidity control is not possible in case of areas catered by ductable split AC.	**Bid stipulations shall prevail. However, bidder may optimise during detailed design after approval of Employer.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
76	Volume II Section-II	18 of 20	22.2.20	**22.2.20 Tests** b) Site Tests The site tests shall include the following but not be limited to: 1. Check of supply completeness and execution of the installation work (visual inspection). 2. Functional test of electrical controls. 3. Measurements of main air flow rates in the air distribution system (by anemometer) 4. Measurements of load characteristic of all major electrical consumers. 5. Temperature and humidity measurements in the rooms.	Customer is requested to review type of AC system and accept type of AC system mentioned above Due to layout constraint, customer is requested to allow for selection of the higher capacity Ductable Split Air Conditioning units.	
77	Volume II Section-II	4 of 20	22.1.6.1	Evaporator unit shall be horizontally/vertically mounted type as required and constructed of galvanised steel sheet of thickness not less than 18 gauge. It shall be suitable for indoor installation above false ceiling and shall have provision for draining out condensate water……..	These items are mass production item and are as per OEM standard. Hence details of the equipment's, shall be as per the OEM standard only. Please accept.	**Bid stipulations shall prevail.**
78	Volume II Section-II	5 of 20	22.1.6.2	**Condensing Unit** The condensate units shall be supplied in weather proof heavy gauge enclosure suitable for outdoor installation. Each unit shall comprise of 2 or 3 independent hermetically/ semi hermetically sealed compressor units together with associated air cooled condensers, refrigerant tubing and electrical system so that if one compressor unit is down, the other compressors can remain in service. The condenser tubes shall be of copper having extended aluminium fins. The refrigerant shall be (i.e. R407 C). The condenser heat shall be removed with the help of a quiet, low speed propeller fan(s)…		
79	Volume II Section-II	5 of 20	22.1.6.3	…….. The duct shall be insulated with 25 mm thick resin bonded mineral wool conforming to IS:8183 and covered with insulation wrapped with wire mesh etc. Diffusers shall be made of heavy gauge extruded aluminium metal. These shall be provided with volume control damper, frame work and gasketing at each duct flange……	Use of nitrile rubber type thermal insulation is also to be permitted.	**Bid stipulations shall prevail.** **Maybe discussed during detailed engineering.**
80	Volume II Section-II	10 of 20	22.2.4	……. It is required to install adequate number of centrifugal/axial flow fans (main and stand by) in the above-mentioned locations, that would be capable of meeting the entire requirements of the air for ventilation system.	Ventilation system of the power house shall be arrived by use of multiple running centrifugal / axial fan and equipment configuration with stand by factor is not available in technical specification. Hence Bidder shall envisage the equipment configuration as N+1 where "N "is number of working units. Customer is requested to review and accept.	**Bid stipulations shall prevail.**
81	Volume II Section-II	12 of 20	22.2.10	**Centrifugal Fans** …… The contractor shall provide adequate number of fans and spares (to be decided during detailed engineering). The fans shall be of double inlet, double width centrifugal type and designed to operate satisfactorily over a range of the rated speed.		**Bid stipulations shall prevail.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
82	Volume II Section-II	11 of 20	22.2.6	**Exhaust System** The exhaust system shall be designed to exhaust 90% of the forced air quantity by installation of exhaust fans of suitable capacity.	A.- Kindly note that 90% exhaust shall require higher number of the wall mounted axial exhaust fan and there will be space constraint on wall for mounting of the exhaust fan. In view of the above, bidder envisage that the exhaust system shall be designed to exhaust 70% of the forced air quantity by installation of exhaust fans of suitable capacity in order to maintain the positive pressure inside power house. Further to above, Bidder shall envisage the equipment configuration as N+1 where "N "is number of working units. Customer is requested to review and accept. B.- Details of system for smoke exhaust system, is not available in tech specification. Please confirm that sperate smoke exhaust system is applicable or not.	**Bid stipulations shall prevail. However, bidder may optimise during detailed design after approval of Employer.**
83	Volume II Section-II	10 of 20	22.2.4	Tato-1 Hydroelectric Project is a surface power station with an installation of three units of 62 MW each. Still, it is proposed to provide forced air ventilation through ventilation ducts for supply of air to various floors and galleries. For exhaust of air, forced exhaust fans are to..... ...It is required to install adequate number of centrifugal/axial flow fans (main and stand by) in the above-mentioned locations, that would be capable of meeting the entire requirements of the air for ventilation system.	There is mismatch in type of ventilation system in both of referred clause. Bidder understand that dry type of the ventilation system for on 100% fresh air supply though centrifugal / axial fan, is applicable. Please review the type of ventilation system (air cooled / water cooled) and confirm. In case of the ventilation system with water cooled AHU, please provide following inputs for sizing of the ventilation system; 1.0 maximum river water temperature. 2.0 maximum inside temperature and relative humidity, to be maintained inside ventilation areas. 3.0 Redundancy of the AHU, Cooling Water pumps, etc,	**At present, no water requirement for AHU is envisaged and the same may be reviewed if required during detail engineering.** **In the drawing, the terminal point has been kept as provision, in case found required during detailed engineering.**
84	Volume-II / Sec-IV			COOLING WATER SYSTEM FLOW DIAGRAM (W.003159-20719-MD-7101) A terminal point shown as TO AHU COOLING COIL FOR HVAC SYSTEM		
85	Volume II Section-II	19 of 20	22.4	22.4 Mandatory Spares: a) Complete Compressor Unit- 01 No. b) Condenser Fan and Motor Unit- 01 No. c) Evaporataor Fan bearing 02 Nos. d) Evaportaor Fan Motor 01 No. e) Thermostat 01 No.	List specified is applicable for only AC system. please review and facilitate the mandatory spare list for AC & Vent system as per the type of the system applicable.	**Bid stipulations shall prevail.**
86	Volume II Section-II	9 of 20	22.2.4	22.1.14 Air Conditioning Load Design Data 12. Lighting Load 25 KW (Fluorescent)	Lighting load per Sq feet area to be considered for AC system sizing, is not available in tech specification. Bidder shall envisage the same as one(1) Watts/ Sq.feet. Please review and confirm.	**Shall be as per relevant standards**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
87	**Volume II Section-II**	**18 of 20**	**22.2.20**	22.2.20 Tests b) Site Tests The site tests shall include the following but not be limited to: 1. Check of supply completeness and execution of the installation work (visual inspection). 2. Functional test of electrical controls. 3. Measurements of main air flow rates in the air distribution system (by anemometer) 4. Measurements of load characteristic of all major electrical consumers. 5. Temperature and humidity measurements in the rooms.	Relative humidity to be maintained in AC area and ventilation areas (in case of water-cooled AHU), is not available in tech specification. please facilitate the design indoor relative humidity for AC & Ventilation areas.	**To be decided during detailed engineering.**
88	**Volume II Section-II**	**20 of 20**	**22.2.20**	ANNEXURE-1	As per the Schedule of Requirement, transformer and GIS are not in bidder's scope. But as per the Annexure-I, HVAC system for Transformer hall and GIS room is in bidders' scope. please review and confirm that HVAC for transformer hall and GIS room is included or not in bidder scope. if included please provide equipment heat dissipation rate for transformer hall & GIS room which are to be considered for HVAC system sizing.	**HVAC for GIS and Transformer hall are in scope of the Bidder. Heat dissipation rate to be provided during detailed engineering.**
89	**Volume-II / Sec-III**		**SOR**	General	Scope of HVAC system for butterfly valve house and relevant access tunnel, is not available in technical specification. Bidder understand that same is excluded from bidders' scope. please review and confirm the scope. If included in bidders' scope, please facilitate layout details for butterfly room and access tunnel along with the ventilation system type details	**HVAC System for Butterfly Valve House of Tato-I HEP is not included the scope.**
90	Vaolume II, Sec-IV	22/24	COOLING WATER SYSTEM FLOW DIAGRAM	The fire tank shall be placed 90m above MIV floor.	We have designed our system considering the static elevation as 90m above MIV floor and elevation lower than 90m will have price impact during ocntract exection stage if new requirement due to elevation change will warrant for additional system/equipment.	**Bid stipulations shall prevail.** **No price impact will be entertained, since this is an EPC Contract.**
91	Vaolume II, Sec-II	7/24	22.5	Mechanical groove type coupling shall be provided for ease of dismantling of pipe & fittings which shall be finalised during detailed engineering..	We would like to clarify that mechanical grooved piping systems have not been provided by us for fire-fighting applications in India till date. In line with our standard practice, we provide flanged connections with break flanges for pipe-to-pipe joints to facilitate easy dismantling and maintenance. This practice is also followed in all the project executed by bidder.	**Bid stipulations shall prevail.** **Shall be discussed during detailed engineering.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
92	Vaolume II, Sec-II , Sub-Sec- 22 Fire Fighting System	13/18		**Fire telephone** An emergency EPABX fire telephone system shall be installed throughout the plant based on a two-way communication system connecting the individual locations with the central control room. The priority features shall be assigned to fire telephone stations in the main control room and GIS building.	Customer may please clarify whether Emergency fire telephone system is required or emergency EPABX telephone system is required for the present application.	**Emergency fire telephone is required.**
93	Volume II Section II Sub-Sec- 22 Fire Fighting System	22.1	15	**Shop Tests** The Contractor is required to submit type test certificates and routine test reports of equipment	Please note that type test certificate is not applicable for pump, pipes, valves, etc. Kindly accept.	**Accepted.**
94	**Volume-II Sec-II (Sub-Sec-06 Isolated Phase Bus duct & Associated Equipments)**	**4**	**6.5.1**	Main run (5000A) length	Length of Main run per Unit is required.	**The bidder shall consider the lengths as per tender drawings for estimation purpose. In the event of minor changes in length of IPBD during excution, the same shall be absorbed by the contractor.** **Delta run is required. However, Design & Engineering being in the scope of the bidder/contractor, requirement of delta run is to be finalized by the bidder**
95	**Volume-II Sec-II (Sub-Sec-06 Isolated Phase Bus duct & Associated Equipments)**	**9**	**6.5.6.1**	Tap-Off run (200A) length	Length of Tap off run per Unit is required. If Delta run persists in this tender, please clarify same.	
96	**Volume-II Sec-II (Sub-Sec-06 Isolated Phase Bus duct & Associated Equipments)**	**5**	**6.5.4**	Porcelain Insulators	Customer is requested to accept Epoxy Insulator.	**Clause no. 6.5.4 (b) accepts both porcelain / epoxy insulators.**
97			Single line Drawing-W.003159-20719-ED-7003	Fault rating for 33kV Switchboard – 31.5kA	We understand fault rating for 33kV switchgear shall be 25kA as per Volume II Section-II, Sub-Sec. 10, Cl 10.4.1 ((pg 9 of 49). Please confirm.	**Fault current of 31.5 kA to be considred.**
98	**Vol-I, Sec-VI**	**9**	**12.4**	The duration of trial operation of the complete equipment shall be six (6) days	(a) Trial Run is for six days as per Cl. 12.4 in Cont. Doc. Vol-I, Sec-VI. Clarification on Initial Operation & Trial Operation of Units is required. (b) Shall the initial operation of one month be carried out by successful bidder / Customer. (c) Clarification on Completion schedule of 35 months is required as it appears that one month of Trial Operation is included in the Completion Period. Clarification is required	Bid stipulations shall prevail.

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
99	Particular Technical Specifications Volume II Section-II Sub-Sec. 01 Turbine, Governors and Main Inlet Valve	Page 6 of 70	1.2.1.2 Main Technical Parameters of Turbine (i)	Capability to give minimum output at any head without any adverse effect. 50% of rated output or lower.	We will offer minimum load upto 50 % of rated output on all heads as specified in particular clause. The same has been accepted in pre-bid replies of previous tender. So, we consider that the same reply shall prevail for present tender. Please accept.	**Accepted.**
100	Particular Technical Specifications Volume II Section-II Sub-Sec. 01 Turbine, Governors and Main Inlet Valve	Page 12 of 70	1.2.4.1 Cavitation guarantee	The loss of material shall be measured by the direct measurement according to IEC Code 60 609. Erosion or damage caused by solid particles in the water and corrosion caused by aggressive chemical substances in water are not intended to be covered by the pitting guarantee. 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.	Kindly allow bidders to offer all the cavitation guarantees shall be as per IEC 60609. Also, we offer to undertake maximum 2 number of repair/replacement within guarantee period, as restoration to original guarantee conditions after repair/replacement will lead to an unending process. Please accept & confirm.	**Bid stipulations shall prevail.**
101	6.Vol-II Sec-IV_Tender Drawings	Page 14 of 18	Power House Cross-section Drg. No.- W.003159-20716-EMD-7201	Draft Tube Dimensions	Draft tube dimensions are completely governed by the model selected for the subject project to achieve required WAE and performance guarantees. Therefore , bidder should be allowed to offer most optimum dimensions of Draft Tube. Considering this fact the bottom most depth of Draft tube wrt turbine centreline should be lowered upto EL. 1010.12 m approx. Clarification has already been provided in pre-bid replies of previous tender. So, we consider that the same reply shall prevail for present tender. Kindly accept.	**Any major changes must be justified based on Model Test and informed well in advance for the required civil work modifications.**
102	Volume II Section I-GTS_ Annexes (3)	Page 22 of 30	4.4 Specific Documents for Mechanical Plant and Installations	4.4.1 Documents for all Mechanical Plants as Applicable	The list of drawings / documents as required in tender specification which need to be submitted to customer for approval , shall be finalized mutually during detailed design stage. The same has been accepted in pre-bid replies of previous tender. So, we consider that the same reply shall prevail for present tender. Kindly accept.	**Accepted.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
103	Particular Technical Specifications Volume II Section-II Sub-Sec.03 Cooling Water System	Page 9 of 14	COOLING WATER SYSTEM- 3.4.1.4 Cyclone Separators	Filtration efficiency 85% down to 100 microns of particles with specific gravity 2.6 & above.	The requirement of filtration of 100 micron for cyclone separator is very high, which may result in drastic increase in overall cost of equipment and unavailabilty in market. Since this cyclone separator is fulfilling the requirement of complete unit, so its filtration rating should be in range of 500 to 1000 microns. Kindly review and accept.	**Bid stipulations shall prevail.**
104	Particular Technical Specifications Volume II Section-II Sub-Sec.03 Cooling Water System	Page 7 of 14	COOLING WATER SYSTEM- 3.4.1.1 Motorized Automatic Online Self Cleaning Strainers	a) For each of Cooling Water Circuit for TG Units :Filtration efficiency 98% down to 100 microns. B) For cooling water circuit of HVAC Cooling Coils: Filtration efficiency 98% down to 200 microns.	The requirement of filtration of 100 micron for duplex strainer is very high, which may result in drastic increase in overall cost of equipment. Since this duplex strainer is fulfilling the requirement of complete unit, so its filtration rating should be around 500 microns. Kindly review and accept.	**Bid stipulations shall prevail.**
105	Particular Technical Specifications, Volume II Section-II, Sub Sec 01, Turbine, Governers and MIV	Page 11 of 70	1.2.4 Guarantees for Turbine Output, Efficiency & Penalties for Shortfall ",f) Capacity and efficiency tests	The clause states "The capacity and efficiency test at different heads and gate opening on the prototype turbine shall be conducted within one year after commissioning to verify that the power output and efficiency guarantees of the prototype have been fulfilled."	The capacity and efficiency test will be conducted at the head available at the time of field acceptance test and results will be convereted to different net heads as per IEC 60041-1999. Please confirm & modify the clause accordingly.	**Shall be discussed during detail engineering.**
106	Particular Technical Specifications, Volume II Section-II, Sub Sec 01, Turbine, Governers and MIV	Page 16 of 70	1.2.6 Turbine Model Test, 1.2.6.2 Model Details, Drawings and Homology	The Clauses states "The model scale, minimum size and homology/ similarity to the prototype turbine shall be in conformity with the IEC code 60193. The model size shall not be less than 300 mm, and the test head shall not be less than 40 m."	Net head during model testing would be as per the IEC 60193-2019. Please confirm & modify the clause accordingly	**Shall be discussed during detail engineering.**
107	Particular Technical Specifications, Volume II Section-II, Sub Sec 01, Turbine, Governers and MIV	Page 16 of 70	1.2.6 Turbine Model Test, 1.2.6.4 Tests on Turbine Model	The Clauses states “g) Air admission test for full sigma range."	Air admission test will be done if pressure pulsation in draft tube cone exceeds permissible limits for the whole sigma range operation. Please confirm & modify the clause accordingly.	**Bid stipulations shall prevail.**
108	Particular Technical Specifications, Volume II Section-II, Sub Sec 01, Turbine, Governers and MIV	Page 17 of 70	1.2.6 Turbine Model Test, 1.2.6.4 Tests on Turbine Model	The Clauses states "k) Curves showing relationship between wicket gate angle and also wicket gate opening in mm vs servomotor storke related to maximum opening of guide vane and clear opening between two adjacent wicket gates."	It may be noted that Servo Motor Design is not finalized till the time of Model Witness test, therefore “wicket gate angle/opening in mm vs servomotor stroke” cannot be part of Model Test Report. However, this information will be given after final design of Servo Motor System. Therefore, this point-k) may please be deleted from model test report. Please confirm & modify the clause accordingly	**As per Tender, Model test report should be as per IEC 60193.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
109	Particular Technical Specifications, Volume II Section-II, Sub Sec 01, Turbine, Governers and MIV	Page 18 of 70	1.2.6 Turbine Model Test, 1.2.6.7 Witness of Model Turbine Test by Employer's/ Consultants Representatives & Model Acceptance	The Clauses states "The Corporation reserves the right to get the model turbine tested in an independent laboratory."	Our Model Test Laboratory is a NABL accredited and Department of Science & Industrial Research (DSIR), Govt. Of India recognised laboratory and has conducted many successful Francis, Pelton, Kaplan turbine model tests. Turbine design is proprietary of nature and cannot be shared with external agencies. Therefore, Model test will have to be done at our Laboratory only. Successful operation of various hydro projects for which model testing has been conducted at this very facility is testimony to the reliability of our laboratory. Hence, we wish to submit that model test or repetition of model test at any other laboratory is not at all required. Please confirm & modify the clause accordingly.	**Bid stipulations shall prevail.**
110	Particular Technical Specifications, Volume II Section-II, Sub Sec 01, Turbine, Governers and MIV	Page 70 of 70	1.14,Index and Field Acceptance (Efficiency) Tests	General query	Detailed Water conductor system drawing not given with tender, please provide the same for deciding the feasibilty and applicability of the turbine efficiency test method as per IEC 60041-1999.	**Drawing of WCS is attached.**
111	Particular Technical Specifications, Volume II Section-II, Sub Sec 01, Turbine, Governers and MIV	Page 22 of 70	**TABLE 2** MATERIALS SPECIFICATIONS FOR MAJOR COMPONENTS	ASTM A537 or equivalent	Kindly allow bidder to offer ASTM A 516 GR. 60 or 70 also, in place of ASTM A537 for all the fabricated items of Turbine and MIV. The same has been accepted in pre-bid replies of previous tender. So, we consider that the same reply shall prevail for present tender. Please accept.	**Bid Stipulations shall prevail. The 'Note' under Table 2 of clause 1.3.6.2 may be referred.**
112	Vol-II Section-II; Sub-section 02	Page 9 of 72	2.3.5.2 Insulation and Temperature Rise	As per this clause temperature rise limit above cold air of 40°C shall be- Stator winding by embedded temperature detectors-75°C Rotor winding by resistance-80°C	As perTable-4 of IEC 60034-33 temperature rise limit above cold air of 40°C shall be- Stator winding by embedded temperature detectors-85°C Rotor winding by resistance-90°C **kindly review the requirements of stator & rotor temperature rise, in line with IEC.**	**Bid stipulations shall prevail.**
113	Vol-II Section-II; Sub-section 02	Page 17 of 72	2.3.7.3 Stator Core	The overall design shall ensure that there is no more than a 5°C temperature difference between any two points of the core.	Since, temperature variations in stator core are generally observed up to 10°C. It is therefore recommended that temperature difference between any two points of the core should be limited up to 10°C, with max. temperature rise of stator core be limited as per IEC. Kindly review & confirm..	**Bid stipulations shall prevail.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
114	Vol-II Section-II; Sub-section 02	Page 31 of 72	2.3.7.17 (ii) Control & Monitoring Devices	Vibration Monitoring System- The vibration monitoring system shall be supplied by reputed manufacturers like VibroSystM or GE Bentley Nevada as approved by the purchaser.	The vibration monitoring system shall be procured & supplied, considering the requirements of Make in India policy of GoI. Also, reputed manufacturers, as mentioned in tender document, like VibroSystM or GE Bentley Nevada as approved by the purchaser, may also participate as prospective bidders in the procurement through GeM portal of GoI for public procurement However,Bidder may also supply its own make vibration monitoring system. Kindly confirm.	**Bidder may chose alternative vendors, subject to prior approval**
115	Vol-II Section-II; Sub-section 02	Page 32 of 72	2.3.7.17 (iii) Control & Monitoring Devices	**Partial Discharge Analyzer-** The technical datasheet of Partial Discharge Analyzer.	The technical datasheet of Partial Discharge Analyzer seems to be supplier specific. Therefore, a techical specification of Partial Discharge system shall be submitted to the purchaser during detailed engineering & the system shall be supplied as per approved specification. It may be noted that the procurement of the system shall be through GeM portal of GoI for public procurement & shall be through competitive buying. Also, any reputed bidder may participate as prospective bidders in the open procurement through GeM portal of GoI for public procurement. Kindly confirm.	**Bid stipulations shall prevail. However, same may be discussed during detail engineering.**
116	Vol-II Section-II; Sub-section 02	Page 32 of 72	2.3.7.17 (iii) Control & Monitoring Devices	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. As per the specified clause, panel mounted PD Analyzer (common to all units) is to be provided for continuous monitoring of stator insulations.** **Other details may be examined during detail engineering.**
117	Vol-II Section-II; Sub-section 02	Page 32 of 72	2.3.7.17 (iii) Control & Monitoring Devices	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 submit the same for your approval.	**Bidder may chose alternative vendors, subject to prior approval**
118	Vol-II Section-II; Sub-section 02	Page 35 of 72	2.3.7.17 (iv) Control & Monitoring Devices	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 receive, we will submit the same for your approval.	**Bidder may chose alternative vendors, subject to prior approval**

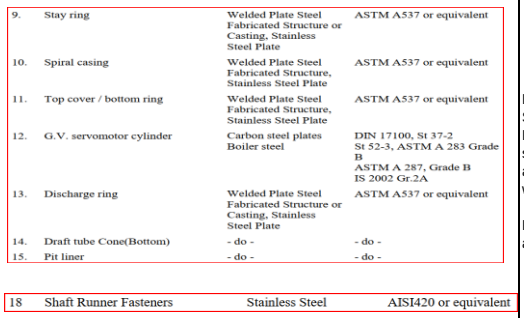
Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
119				Air Gap Monitoring System (AGMS)	For rating below 100 MW, Air Gap Monitoring System is not required as per CEA guidelines. Therefore, please review the requirement and delete the same.	**Bid stipulations shall prevail.**
120	Vol-II Section-II; Sub-section 02	Page 40 of 72	2.3.7.17 (iv) Control & Monitoring Devices	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. Therefore, the requirement of Chartless Rotor temperature recorder may be deleted. Kindly confirm.	**The requirement may be reviewed during detailed engineering.**
121	Vol-II Section-II; Sub-section 02	Page 45 of 72	2.3.7.17 (iv) Control & Monitoring Devices	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 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 review and confirm the acceptance.** 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	**Bid stipulations shall prevail. However, the requirement may be reviewed during detailed engineering.**

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
					Please note that these tests are not practically feasible to perform at site, therefore we do not recommend these tests to be performed at site. Kindly review and confirm the acceptance. 6. Full runaway speed Test for 2 minute duration Being a detrimental test, We do not recommend this test. **Please review and confirm.**	
122	Vol-II Section-II; E1	Page 46 of 72	2.3.11.5 Field Acceptance and Performance Tests	**The following tests shall be performed on generator:** • Impulse short-circuit test at reduced voltage acc. to IEC 60034-1, Para. 24; • Determination of the values for Xd, X'd, X"d, and Xq; • Determination of the following constants: T'do, T'd, T"d and 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 review and confirm the acceptance.	**Bid stipulations shall prevail. However, the requirement may be reviewed during detailed engineering.**
123	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 14 of 72 & 23 of 72	2.3.7.1 .General & 2.3.7.9 Thrust & guide bearing	Bearing arrangement - Suspended type -The Bearing arrangement of Generator shall be Suspended type with a guide Bearing and a thrust cum guide Bearing above the Generator rotor. -The generator shall have a combined thrust and guide bearing located above the rotor and a guide bearing below the rotor.	For machines with rated speed of 300 rpm of similar capacity, it is preferable to have construction semi-umbrella type. Main advantages for this type of construction are: - The thrust load gets transferred directly to concrete - Maintenance friendly - Better power unit stability due to combined thrust & guide bearing in center of power unit	**Bid stipulation shall prevail**
124	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 11 of 72	2.3.5.8 Runaway speed withstand capacity	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.	We do not recommend runaway speed test due to invasive nature of the test. Kindly accept.	**Bid stipulation shall prevail**
125	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 10 of 72	2.3.5.2 Insulation & Temperature rise	Thrust bearing babbit temeprature - 65 degree celcius	The mentioned temperature limit is contradictory. As per practice Thrust bearing temperature are as per following i. Maximum permissible operating temperature ≤ 70 ºC; ii. Alarm temperature 75 ºC; iii. Trip temperature 80 ºC. Kindly confirm the above.	**Clause no. 2.3.5.2 specifies the maximum temperature of babbit material with one cooler out of service and unit operating at specified overload.** **Cllause no. 2.3.7.9 specifies the temperature limits for bearing metal at 80.24 MVA as below;** **i. Maximum permissible operating temperature ≤ 70 ºC;** **ii. Alarm temperature 65 ºC;** **iii. Trip temperature 70 ºC.**
		Page 24 of 72	2.3.7.9 Thrust & guide bearing	The design of the bearings shall be based on limiting the bearing metal operating temperatures for operation at 103.5 MVA, as given below: i. Maximum permissible operating temperature ≤ 70 ºC; ii. Alarm temperature 75 ºC; iii. Trip temperature 80 ºC.		

Sl. No.	Volume	Page No.	Clause No.	Tender Provision	Bidders Queries	NEEPCO Replies
126	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 20 of 72 Page 28 of 72	2.3.7.7. III Rotor Rim 2.3.7.13 Rotor Fan	Cooling fan blades shall be cast aluminum and constructed to preclude vibration. The Axial Fans will consist of a large number of specially shaped aerofoil aluminum blades assembled to the fabricated support segments.	As per our practice we propose fabricated type aerofoil Fan blades . Kindly confirm the same.	**The manufacturer may use their standard design by providing reasons and advantages, subject to prior approval, during detailed engineering**
127	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 20 of 72	2.3.7.7. III Rotor Rim	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.	As per our practice 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.	**The manufacturer may use their standard design by providing reasons and advantages, subject to prior approval, during detailed engineering.**
128	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 23 of 72	2.3.7.9 Thrust & guide bearing	The bearing shall be lined with ASTM-B23, type 2 antifriction Babbit metal.	As per bidder practice we use babbit material as per IS: 25, 84% TIN based bearing friction alloy .Same material is used in more than 500 genrators supplied by bidder. Kindly accept the same.	**The manufacturer may use their standard design / material by providing reasons and advantages, subject to prior approval, during detailed engineering.**
129	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 22 of 72	2.3.7.8 Generator Shaft	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.**
130	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 23 of 72	2.3.7.8 Generator Shaft	The critical speed of the shaft at balanced condition shall be over 25% of 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	**Bid stipulations shall prevail.**
131	Vol-II Section-II;Sub-Sec.02 Generator & excitation system	Page 20 of 72	2.3.7.7. III Rotor Rim	The laminations shall allow for dovetail slots to which the poles shall be installed.	We use T-shaped slots instead of dovetail slots for installation of poles. Kindly accept the same.	**The manufacturer may use their standard design by providing reasons and advantages, subject to prior approval, during detailed engineering.**
132	Vol-II Section-I;GTS	Page 13 of 129	0.3.4 Material standards	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 specification).	**Bid Stipulations shall prevail. The 'Note' under Table 2 of clause 1.3.6.2 may be referred.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
General Technical							
133	Volume II, Section-I General Tech. Specification	0.3	Standards	8 of 125	Although Indian or IEC standards for workmanship material and plant have been selected generally in these specifications as a basis of reference, other standards and recommendations of standard international organisations will be acceptable provided they ensure equal or higher quality than those specified, and provided, furthermore, that the Contractor submits for approval, detailed standards which he proposes to use.	Although Indian or IEC standards for workmanship material and plant have been selected generally in these specifications as a basis of reference, other standards and recommendations of standard international organisations will be acceptable provided they ensure equal or higher quality than those specified, and provided, furthermore, that the Contractor submits for approval, **extracts of the standard** which he proposes to use, as Standards are copyright products and cannot be shared. Please accept the above change in the paragraph.	**Agreed**
134	Volume II, Section-I General Tech. Specification	3.11.3.2	Non-Destructive Examina	52 of 125	<table><tr><th>Type of weld</th><th>Type of Inspection</th><th>Extent of Inspection</th></tr><tr><td>Groove weld on tension butt joint</td><td>Radiographic</td><td>100 %</td></tr><tr><td>Groove weld on compression butt joint</td><td>Radiographic</td><td>10 %</td></tr><tr><td>Groove weld on joints not suitable for radiographic inspection</td><td>Ultrasonic</td><td>100 %</td></tr></table>	Radiographic testing of weld joints is not recommended as radiography poses health issues of the persons. So in the view of this, we proposes to have ultrasonic testing of all type of weld joints which fulfils all the design and quality requiremnts.. Please accept.	**100 % Ultrasonic testing of weld joints shall be accepted.**
135	Volume II, Section-I General Tech. Specification	4.1	General	61 of 125	Revolving parts shall be truly balanced both statically and dynamically that when running at normal speed and at any load p to the maximum, there will be no vibration due to lack of such balance.	Please note that the rotating parts shall be balanced as per design application and applicable standards. Please accept.	**Bid Stipulations shall prevail.**
136	Volume II, Section-I General Tech. Specification	6.1.2	Standards	96 of 125	If the Contractor intends to apply Standards and Regulations other than those specified, he shall provide the Engineer with two (2) sets of such documents, which shall be complete, unabridged and written in the Contract Language.	If the Contractor intends to apply Standards and Regulations other than those specified, he shall provide the **extract of the applicable standard** written in contract language. Please accept the above chane in the paragraph.	**Agreed**
Hydraulic							
137	PTS, Volume II, Section II, Sub-Sec 01 Turbines, Governors and Main Inlet Valve	1.1	1.1 Scope	4 of 70	c) Three (3) numbers 2400 mm nominal diameter main inlet valves, of Butterfly type to suit above turbines	We understand that the 2400 mm nominal diameter of main inlet valve is the minimum size requirement for the project. However bidder may select the equal or higher size of main inlet valve based on the selected solution for the project. Kindly confirm.	**2400 mm is the minimum nominal diameter of the MIV. If the bidder wishes to select MIV of higher size, the necessary provisions for matching with the penstock shall be in the bidder's scope.**
138	PTS, Volume II, Section II, Sub-Sec 01 Turbines, Governors and Main Inlet Valve	1.6	1.6 Turbine Main Inlet Valves	53 of 57	1.6.1.1 Each turbine shall be provided with an inlet butterfly valve of 2400 mm nominal size….....		
139	PTS, Volume II, Section II, Sub-Sec 01 Turbines, Governors and Main Inlet Valve	1.2.4	1.2.4 Guarantees for Turbine Output, Efficiency & Penalties for Shortfall	10 of 70	The turbine OUTPUT and EFFICIENCY shall be guaranteed by the Contractor. The following requirements and rules for the guarantees apply: ……. c) Turbine efficiencies at following net heads in the specified working head range: 153.3 m & 163.2 m d) Weighted turbine efficiency The model and the prototype weighted turbine efficiency shall be guaranteed. The weighted average efficiency of the Turbine at rated net head for 110 %, 100 %, 75 % and 50 % rated output shall also be guaranteed as per the formula.....	We understand that the only Weighted average efficiency shall be subjected to guarantee purpose. The efficiency/ discharge/ guide vane opening values at single operating points shall not be subjected to guarantee. Kindly accept.	**The weighted average efficiency shall be subjected to guarantees as per clause 1.2.4.**
140	PTS, Volume II, Section II, Sub-Sec 01 Turbines, Governors and Main Inlet Valve	1.2.4	1.2.4.1 Cavitation guarantee	12 of 70	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. Kindly accept.	**Bid Stipulations shall prevail.**
141	PTS, Volume II, Section II, Sub-Sec 01 Turbines, Governors and Main Inlet Valve	1.2.5	1.2.5.1 Smooth, Stable & Quiet Operation and Noise Limit	13 of 70	The contractor shall guarantee that the detrimental pulsations (both for pressure and power) do not occur at any load from 40% of full load to permissible maximum load at any net head from minimum to maximum. 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: "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". This is as per general practice of all hydro projects and reference can be drawn to many PSU projects. This is very critical and hence request you to kindly review and accept.	**Bid Stipulations shall prevail.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
142	Volume-II Sec-II Sub-Sec- 01 Turbines, Governers and Main Inlet Valve	1.2.6.6	Presentation of Model Test Report	17 of 70	k) Curves showing relationship between wicket gate angle and also wicket gate opening in mm vs servomotor storke related to maximum opening of guide vane and clear opening between two adjacent wicket gates.	Curves showing relationship between wicket gate angle and also wicket gate opening in mm can be provided during model testing however, the relationship between wicket gate opening in mm and servomotor stroke shall be provided in project execution stage for prototype. Please accept.	**As per Tender, Model test report should be as per IEC 60193.**
143	PTS, Volume II, Section II, Sub-Sec 01 Turbines, Governors and Main Inlet Valve	1.5.3	1.5.3 Governor Operating Parameters	48 of 70	1.5.3.2 g) Wicket gate closing time Adjustable 8 to 12 secs, having dual fast and slow action. 1.5.3.3 For the closing operation a dual rate of closure has been considered to be required to restrict transient speed rise of the turbine to within 45%. The governors shall therefore provide a dual rate of closure for the wicket gates faster in the first half of the closing period and slower in the second half. The governor closing and opening times as also the dual rates of closure shall be adjustable within the specified range. The maximum dynamic pressure at the turbine inlet level has been specified to be restricted to 230.55 m.	We understand that the bidder is open to select/ define the wicket gate operating law (linear or dual) and opening/ closing time based on transient analysis keeping the pressure rise and speed rise within defined limit. Kindly confirm.	**The wicket gate operating law shall be dual. The bidder may finalize the opening/ closing time based on transient analysis keeping the pressure rise and speed rise within defined limits, with no -ve pressure along WCS.**
144	PTS, Volume II, Section II, Sub-Sec 02 Generator and Excitation System	2.3	2.3. Generator 2.3.4 Technical Parameters	8 of 72	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 equipement 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.**
145	Volume II, Section IV, Drawings		Power House Cross Section & Plan Dwg No. W.003159-20716-EMD-7201_Rev A0 & W.003159-20716-EMD-7202_Rev A0	pdf page 14 & 15 of 24	From Power house cross section and plan drawing (W.003159-20716-EMD-7201_Rev A0 & W.003159-20716-EMD-7202_Rev A0): Draft tube bottom point elevation: 1011.62 masl Draft tube exit height : 3500mm Draft tube exit width : 6400mm	We understand that the draft tube dimensions (bottom point elevation, exit height & exit width) defined in the power house cross section and plan drawing (W.003159-20716-EMD-7201_Rev A0 & W.003159-20716-EMD-7202_Rev A0) are preliminary/ tentative. However, final dimensions of draft tube (bottom point elevation, exit height, exit width) shall be defined by bidder based on the selected hydraulic solution and shall be informed in bid. Kindly accept.	**Agreed.** **However any major changes must be justified based on Model Test and informed well in advance for the required civil work modifications.**
146	TDS, Volume II, Section IV Sub-Sec-01 Turbines, Governors and Main Inlet Valve	A.02 & A.03	A.02 Guaranteed output at generator terminal for the following heads: & A.03 Guaranteed turbine output for the following heads:	1 of 11	i. Guaranteed max. Output at 75% of rated head j. Guaranteed max. Output at 50% of rated head & e. Guaranteed max. Output at 75% of rated head f. Guaranteed max. Output at 50% of rated head	As project net head range is fixed (153.3m to 163.2m), so kindly delete the ouput guarantee requirement at 75% & 50% of rated head.	**Agreed.**
147	TDS, Volume II, Section IV Sub-Sec-01 Turbines, Governors and Main Inlet Valve	A.04 & A.05	A.04 Turbine efficiency A.05 Weighted Average Efficiency of Turbine Generator Unit	1 of 11	A.04 Turbine efficiency: Guaranteed efficiency of Turbine at rated head for the following outputs: a 110% % b 100% % c 75% % d 50% % e Weighted Average Efficiency of Turbine %	We understand that the only weighted average efficiency and rated point (100%) efficiency values are subjected to guarantee/ LD/ penality purpose as per PTS requirement. Efficiency values at other individual points are for information purpose only. Kindly confirm.	**Agreed.** **However, the bidder may note that the efficiency of the turbine at other individual points i.e. 110%, 75% and 50% contribute to the calculation of the WAE (which is a guaranteed technical particular).**
148	TDS, Volume II, Section IV Sub-Sec-01 Turbines, Governors and Main Inlet Valve	A.06	A.06 Turbine Discharge for the following outputs	1 of 11	A.06 Turbine Discharge for the following outputs: a Guaranteed max. Output at rated head (153.3 m) m3/sec b Guaranteed rated Output at rated head (153.3m) m3/sec c Guaranteed max. Output at max. head m3/sec d Guaranteed max. Output at min. head m3/sec e Guaranteed max. Output at 75% of rated head m3/sec f Guaranteed max. Output at 50%of rated head m3/sec	We understand that the requested discharge values are only for information purpose. Kindly confirm.	**Requested discharge values for sl. no. a & b are to be guaranteed.**
149	TDS, Volume II, Section IV Sub-Sec-01 Turbines, Governors and Main Inlet Valve	A.06	A.06 Turbine Discharge for the following outputs:	1 of 11	A.06 Turbine Discharge for the following outputs: e Guaranteed max. Output at 75% of rated head m3/sec f Guaranteed max. Output at 50%of rated head m3/sec	As project net head range is fixed (153.3m to 163.2m), so kindly delete the guarantee requirement at 75% & 50% of rated head.	**Requested discharge values for sl. no. a & b are to be guaranteed.**
150	TDS, Volume II, Section IV Sub-Sec-01 Turbines, Governors and Main Inlet Valve	A.12	A.12 Max. Water Hammer Pressure: % of rated head	2 of 11	A.12 Max. Water Hammer Pressure: % of rated head	Maximum water hammer pressure shall be defined in trem of % of maximum static head as specifed in PTS. Kindly update the clause as: A.12 Max. Water Hammer Pressure: **% of maximum static head**	**Agreed.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
151	TDS, Volume II, Section IV Sub-Sec-01 Turbines, Governors and Main Inlet Valve	A.14	A.14 Guide Vane Apparatus:	2 of 11	g Guide vane opening (%) for maximum output at rated head ≤90%	The maximum output (110%) shall be achieved within full guide vane opening inline PTS. So kindly request you to delete the requirement to maintain the guide vane opening ≤90%.	**Agreed.** **However, bidder is requested to note that as per TS "The Turbine shall be capable of generating the rated capacity kW at the Generator terminals at rated head with guide vane opening of about 85% such that the over load capacity 10% is satisfied."**
152	TDS, Volume II, Section IV Sub-Sec-01 Turbines, Governors and Main Inlet Valve	D.1	D.1 Turbine Technical Data	6 of 11	D.1.1 Turbine Design Data b Discharge i) Max. Discharge at max. head m3/s ii) Min. Discharge at min. head m3/s c Efficiency i) Efficiency at max. head & max. discharge % ii) Efficiency at min, head & min. discharge %	We understand that the only weighted average efficiency and rated point (100%) efficiency values are subjected to guarantee/ LD/ penality purpose as per PTS requirement. Efficiency/ discharge/ guide vane opening values at other individual points are for information purpose only. Kindly confirm.	**Agreed.** **However, the bidder may note that the efficiency of the turbine at other individual points i.e. 110%, 75% and 50% contribute to the calculation of the WAE (which is a guaranteed technical particular).**
Turbine							
153	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.2.4.2	1.2.4.2 Limit on Erosion By Silt:	13 of 70	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 the detailed Engineering after study of the detailed water petrographic analysis report. Please review the requirement.	**Bid stipulations shall prevail**
154	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.2.5.1	1.2.5.1 Smooth, Stable & Quiet Operation and Noise Limit	13 of 70	Turbine design shall be such as would ensure smooth and quiet operation with low vibrations, pressure pulsations, power fluctuations and noise etc. The vibration amplitude at the shaft shall not exceed the recommended values specified in ISO- 7919 (part 1), ISO-3945, ISO-20816-5 and VDI-2056 or as per latest revision of applicable standards.	The vibrations amplitude shall be as per the values specified in ISO- 20816-5. The standards ISO-10816 and ISO 7919-5 shall be read as ISO-20816-5 now. Please review the requirement.	**As per latest revision of applicable standards.**
155	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.2.5.4	1.2.5.4 Design Stress Limits	14 of 70	Direct or combined steady stresses: (1) For materials used in the construction of the equipment, the maximum stress due to maximum normal rated load operating conditions shall not exceed one-third of the minimum yield point or one-fifth of the minimum ultimate strength of the material, which ever is lower.	The design stress limit shall be followed as for the conditions occurring in normal operation shall not exceed one-half (1/2) of the yield strength of the material. Please review the requirement and confirm the above mentioned stress criteria as followed for the hydro turbines world wide based on the advanced tool/ software's calculations.	**Bid stipulations shall prevail**
156	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.3.5.2	1.3.5.2 Jointing	20 of 70	The joints between the various sections and quadrants of the scroll casing and stay ring shall be of welded and bolted flanged type respectively. Alternatively shop welded Stay Ring is also acceptable. Stay ring in a single piece is preferable.	The joints between the various sections and quadrants of the scroll casing and stay ring shall be as per the bidder standard design practice.	**Agreed.**
157	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.3.6	1.3.6 Manufacture & Materials of Components	22 of 70		Material IS 2062 E250/ E350, IS S235 J2/ 355 J2/ Equivalent for stay ring & Stay Vanes, Spiral Casing, Draft Tube Cone, Discharge ring, Bearing Housing, Bottom Ring, Head Cover, Servomotor Body, Piston & Rings shall also be acceptable in addition to the mentioned in tender specification as these standard materials for the similar type of Turbines are accepted worldwide also and worked successfully. For Coupling Bolts 34CrNiMo6/ 42 CrMo 4/ Equivalent material shall also be acceptable.	**Bid stipulations shall prevail. Refer 'Note' at the end of Table 2 of clause 1.3.6.2.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
158	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.3.9	1.3.9 Handling of Components	24 of 70	1.3.9.5 In addition to the removal of turbine components through stator bore as mentioned above, turbine construction shall provide for removal of the following components from bottom without dismantling generator. vi) The facing plates and 1.3.9.7 Further the removal and replacement of worn out labyrinth wearing rings, cheek plates, shaft gland, guide bearing and such other components shall be fast and easy. Where possible the design shall provide for the removal and replacement of these components particularly the labyrinth wearing rings, cheek plates, shaft gland etc. from below.	For Head Cover Facing plate replacement, the removal of head cover is required and it shall be done from top side that needs the removal of Generator Rotor. Please review the requirement and allow the same.	**Noted.**
159	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.3.10	1.3.10 General Physical Layout & Arrangement	27 of 70	Easy access for repair and maintenance of removable/ renewable under water parts of turbine such as wearing rings, cheek plates, guide vanes sealing elements and turbine guide bearing and shaft seals shall be provided from the turbine pit without resorting to dismantling of turbine runner.	It shall be noted that for repair and maintenance of removable/ renewable under water parts of turbine such as wearing rings, cheek plates, guide vanes sealing elements and turbine guide bearing and shaft seals needs to dismantle the turbine runner after considering the turbine size and silt in the water.	**To be decided during Detailed Engineering.**
160	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.4.1	1.4.1 Runner	28 of 70	1.4.1.1 Manufacture The runner shall be of cast stainless steel, in one piece and shall be designed to provide the best hydraulic profile so that it gives the maximum efficiency with minimum cavitation.	The runner shall be cast-welded type. However it shall be supplied at the site in one piece.	**As per Manufacturer's standard practice.**
161	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.4.1.2	1.4.1.2 Materials	29 of 70	The Turbine Runners shall be made of stainless steel of 13 % chromium, 4 % nickel (DIN 17.445, Werkstoff-Nr. 1.4113, G-X5 CrNi 13.4, ASTM A 743 CA 6 NM), with ultra low sulphur and nitrogen content. The minimum Charpy V-notch impact strength at -10°C shall be 30 J, to be fulfilled by each of 3 specimens	The minimum Charpy V-notch impact strength shall be as per the applicable standard of the corresponding material.	**Bid stipulations shall prevail.**
162	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.4.3.7	1.4.3.7 The turbine guide bearing shall be designed for the following conditions:	33 of 70	d. Safely withstand turbine going to run away speed due to any fault for a period of 15 (fifteen) minutes with cooling water supply intact and subsequent closing down period without any damage to the guide bearing.	The requirement for 15 minutes on higher side. It shall be for the 10 minutes for the compact and efficient design of the turbine. Please review the requirement and confirm.	**Bid stipulations shall prevail.**
163	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.4.6	1.4.6 Stay-Ring	35 of 70	For fabricated stay ring designs, the stay vanes shall protrude through the upper and lower shroud plates and shall be shop-welded with full penetration welds. Fabrication of the stay ring in the field will not be allowed.	If stay ring would be provided in two pieces/ sections then its fabrication is required at site and fabrication of stay ring at site is standard practice where transport limitation forced the design of these parts in to the sections. Please review the requirement and confirm.	**To be decided during Detail Engineering.**
164	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.4.12	1.4.12 Guide Apparatus	41 of 70	1.4.12.7 Suitable shear pin shall be provided between each wicket gate stem and gate operating ring which shall be strong enough to withstand the maximum normal operating forces but will break or yield due to forces in opening or closing direction and will protect the rest of the mechanism from damage when one or more of the wicket gates become jammed.	Considering the size and rating of the turbine, the bending link shall also be allowed in place of the shear pin device. The bending link design would provide more compact turbine design.	**Noted.** **Bidder to justify the alternative design without affecting any functional requirement, during detailed design.**
165	Volume II Section II Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.13	1.13 Inspection and Testing at Site	69 of 70	g) The machine shall be designed to withstand the runway 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.	Runaway speed test shall not be performed as it requires the complete inspection of the Power Unit and may 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 said duration.	**Bid stipulations shall prevail. However, final decision regarding conducting of Runaway sped test shall be taken during detailed engineering stage.**
Generator							
166	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3.4 2.3.7	7, 13 & 23 of 72	2.3 Generator 2.3.4 Technical Parameters 2.3.7.1 General 2.3.7.9 Thrust & Guide Bearings	-Type: 2: Salient Pole / Suspended Vertical shaft type synchronous generator……. 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..... 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.....	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. Main advantages for this type of construction: - The thrust load gets transferred directly to concrete - Maintenance friendly - Better power unit stability due to combined thrust & guide bearing in center of power unit Please allow bidder to choose the type of generator construction type as per their best practice.	**Bid stipulations shall prevail**
167	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3 2.3.2	6 of 72	2.3. Generator 2.3.2 Mode of Operation	- One (1) maximum runaway speed condition per year - About 104 tripping per year - A useful life of 50 years	As per IEC 60034-33: 2022, clause no. 9.7 : - Three (3) maimum design speed for the complete life time. - 500 full-load rejections for the complete life time - Useful life of 40 years shall be considered Kindly accept the criteria stated in IEC standard above.	**Bid stipulations shall prevail**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
168	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3.5.2	9 of 72	2.3.5.2 Insulation and Temperature Rise	- The maximum temperature rises in condition of one cooler out of service and unit operating at specified overload shall be guaranteed as the following while operating at maximum continuous overload rating of 80.24 MVA. Stator winding by embedded temperature detectors = 75°C Rotor winding by resistance = 80°C Collector rings by thermometer = 75°C Guide bearing Babbitt temperature = 65°C Thrust bearing Babbitt temperature (if applicable) = 65°C Oil sump temperature = 55°C.	As per IEC 60034-33: 2022, clause no. 6.1 : Temperature rise up to class B (Thermal class - 130) shall be: For Stator winding = 85°C For Rotor winding = 90°C Based on reference of recent executed projects: Absolute temperature will be following: Guide bearing Metal temperature = 70°C Thrust bearing Babbitt temperature = 80°C Kindly Accept.	**Bid stipulations shall prevail**
169	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3.5.6	10 of 72	2.3.5.6 Wave Form & Telephone Influence Factor (TIF)	The total harmonic distortion shall not exceed 1.5 percent according to IS.	As per IEC 60034-33: 2022, clause no. 5.10 : Total Hormonic Distortion (THD) ≤ 3% is applicable. Kindly accept.	**Bid stipulations shall prevail**
170	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3.7 2.3.7.1	14 of 72	2.3.7 Design and Construction 2.3.7.1 General	The unit maximum material stresses in the equipment and embedded parts under the combination of all loads during continuous operation shall not exceed 30% of the yield point strength or 20% of the ultimate strength of the material whichever is lower. For other rotating parts of the generator, the maximum stresses due to severe operating conditions (such as runway speed, short circuit etc) shall not exceed 60% of the yield point.	Based on the reference of recent executed projects: The generator component are mainly made of structural steel material which is ductile in nature. In this case only yield criteria (1/3) YP is recommended. Kindly accept.	**Bid stipulations shall prevail**
171	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3.7 2.3.7.1	14 of 72	2.3.7 Design and Construction 2.3.7.1 General	In addition to the above, Contractor may also consider other severe conditions as applicable for the equipment. In pre-tensioning bolts, the pre stressed level shall be between 33% and 60% of yield point strength.	In pre tension bolts, the pre stressed level shall be 80% of the yield point strength. Kindly accept.	**Bid stipulations shall prevail**
172	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3.5.3	10 of 72	2.3.5.3 Short Circuit Capability	The generator shall be capable of withstanding three phase short circuit at the generator terminals when operating at 80.24 MVA and rated power factor with 15% over voltage for a period not less than 3 sec.	As per IEC 60034-1, capable of withstanding three phase short circuit at the generator terminals when operating at 80.24 MVA and rated power factor with 5% over voltage for a period not less than 3 sec.	**Bid stipulations shall prevail**
173	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3 2.3.5.5	10 of 72	2.3 Generator 2.3.5.5 Short Duration Overloads	The generator shall be capable of withstanding overloads upto 1.5 times the rated current for short durations not exceeding 30-45 second each time.	As per IEC 60034-1, capable of withstanding overloads will be provided upto 1.5 times the rated current for short durations not exeeding 30 sec.	**Bid stipulations shall prevail**
174	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3 2.3.5.8	11 of 72	2.3.5.8 Runaway Speed Withstand Capability	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.	We do not recommend to perform runaway speed test due to its invasive nature however power unit components are designed to withstand the maximum runaway speed as per tender requirements. Kindly confirm.	**Bid stipulations shall prevail. However, final decision regarding conducting of Runaway speed test shall be taken during detailed engineering stage.**
175	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3 2.3.6	12 of 72	2.3.6 Efficiency and Output Guarantees of the Generator and TG Unit	Field efficiency tests shall be carried out on one of the Generators, in accordance with the IEC 60034-2 and IEC 60034-2A standards, and the weighted average efficiency will be determined. Individual losses shall also be established using those standards. No positive tolerance in the guaranteed efficiency shall be permitted. The Generator to be tested will be chosen by Employer. Losses to be considered for calculation of efficiency, shall be summation of individual losses as per IEC-34-2 or IS-4889 including static excitation losses. The losses shall be based on reference temperature of 90 deg. C and shall also be include bearing losses.	As per IEC 60034--2, the losses shall be provided based on the reference temperature of 95°C.	**Bid stipulations shall prevail**

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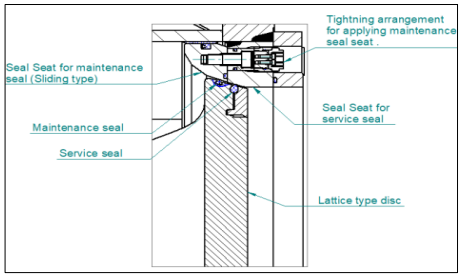
176	Volume II Sec-II (PTS) Sub-Sec-02 Generator and Excitation System	2.3.11.4	44 of 72	2.3.11.4 Wet Commissioning Tests	Sudden short circuit test from not less than 0.50 rated terminal voltage to determine reactance and time constants.	Sudden short-circuit test being an invasive test, bidder do not recommend to conduct this test and hence request to remove this requirement. Also, 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	**Bid stipulations shall prevail. However, the requirement may be reviewed during detailed engineering**
Main Inlet Valve (MIV)							
177	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.1	Description and Operation Requirements	54 of 70	1.6.1.6 The butterfly type inlet valves shall be designed to close against full discharge in emergency and to open under balanced conditions.	For design of valve as per standard practise, 2 times of maximum discharge will be considered as full discharge in emergency condition. Please accept.	**Accepted.**
178	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.2 1.6.2.3	Provision to Withstand Silt Abrasion Maintenance and Replacement of Worn out Working Parts	56 of 70	1.6.2.3 - ii) Replacement of worn out maintenance seal on the upstream end of valve shall be possible without dismantling of the spherical valve, but after dewatering of the upstream pressure shaft.	We understand that spherical valve mentioned in this clause is a typographical error and same shall be updated as butterfly valve. Please confirm.	**Agreed.**
179	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.3 1.6.3.1	Construction Details Valve Body	56 of 70	1.6.3.1 - i) The valve body shall be made of high strength steel plates equivalent. The valve body shall be suitably split for assembly and transport and shall have integral support feet.	Manufacturing of Valve Body by Steel Casting with steel plate fabricated shall also be allowed. We propose to offer Butterfly Valve DN2400 PN23 - Single Disc, Double Seal and Body Non -Split design with transport dimension of ~ 4.2m x 3.4m x 1.2m (L x W x H) and ~ 27 Ton (Bare Valve Weight) . Kindly accept our Proposal.	**Agreed. As per standard manufacturing practice of the bidder and project specific requirements.**
180	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.3 1.6.3.2	Construction Details Rotor, Trunnions & Bearing	56 of 70	1.6.3.2 - i) The valves rotor shall be made of high strength steel plates corresponding to ASTM-537 class-2 modified, or steel casting corresponding to A 148 Grade 80-50, or equivalent.	We propose for following materials: (S355 J2+N) + (ASTM A216 Gr. WCC or IS 1030) i.e Cast +Fabricated design . Kindly accept our proposal.	**Bid stipulations shall prevail.**
181	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.1 1.6.3 1.6.3	Description and Operation Requirements Construction Details 1.6.3.3 Service And Maintenance Seals Construction Details 1.6.3.9 Safety	54 of 70 57 of 70 60 of 70	1.6.1.8 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 operatedwith oil operated solenoid valves.The seals shall be of material having highresistance to silt erosion. Suitable protection against abrasion shall be provided toensure high reliability of sealing and long life. Leakage, if any, shall be stated andguaranteed. Permissible leakage shall be guided by IS:7326 (Part-1). i) The sealing systems, one for normal service on downstream side of the MIV and the other on the upstream side for maintenance of the service seal shall be provided in the MIV. ii) The service seal system shall consist of the movable sealing ring of step-piston type design located in the valve body and the fixed seal ring fitted on to the valve rotor. The sealing rings shall be castings of 13-4 Cr-Ni stainless steel or better, of suitable grades and machined over. The maintenance sealing rings shall be identical to the service seal system as above. iii) When closed, the sealing systems shall provide a drip tight seal both on the downstream and upstream. The movable seals shall be pressed hydraulically against the fixed seals. Permissible leakage shall be guided by IS:7326 (Part-1) iii) It will not be possible to open the butterfly valve unless both the service seal andthe maintenance seal are in open position.	We propose to offer maintanance and service seal of NBR material, on bipalne lattice type discs as per following image. Service seal will be self-engagement type while maintenance seal will be applied by giving sliding movement to seal seat of maintance seal by manuall operation . Kindly accept our proposal. Permissible leakge will be as per leakage clause mentioned in IS 7326 (PART-1) 	**To be decided during detail engineering. The bidder shall submit a Technical Note along with justifications for approval by NEEPCO.**
182	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.3	Construction Detail 1.6.3.4 Servomotors and Operating Gear	57 of 70	i) Two hydraulic servomotors, one on each side of the valve shall be provided. Servomotor(s) shall be of cast steel or of fabricated design with steel piston and rods, upper and lower covers, cast iron-bronze piston rings, sealing glands, pipe connections, plugged holes for air and oil discharge from the cavities in the upper and lower servomotors.	Material and make of different parts of servomotor shall be shared during Detail Engineering phase. Please accept.	**Bid stipulations shall prevail. Refer 'Note' at the end of Table 2 of clause 1.3.6.2.**

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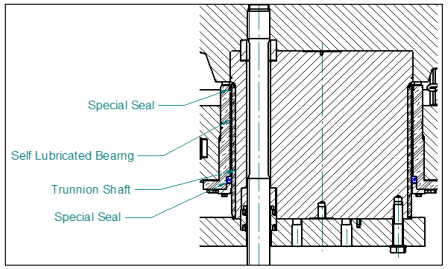
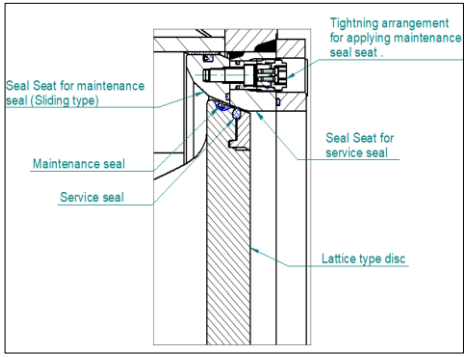
183	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.3	Construction Detail 1.6.3.6 Inlet Pipe	58 of 70	i) The inlet pipe shall be fabricated high strength steel plats ASTM-537, class-2 modified steel. It shall have provision for bolted flanged and connection to the butterfly valve inlet and welding end for connection to the penstock of 2400mm dia. The flare angle shall not exceed 7.50 and length of the inlet pipe provided shall be fixed accordingly with sufficient extra length as trim allowance for errors in installation. Welding of the inlet pipe to the penstock shall be the responsibility of the supplier.	For Inlet pipe, we request you to accept S355 J2 +N Material. Kindly accept.	**Bid stipulations shall prevail. Refer 'Note' at the end of Table 2 of clause 1.3.6.2.**
184	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.3	Construction Detail 1.6.3.7 Outlet Pipe with Compensator (Dismantling Pipe)	59 of 70	i) Outlet pipe shall be of fabricated steel of high strength steel plates ASTM-537, class-2 modified. It shall comprise of pipes, compensating ring, packing and fasteners. One side shall be connected to the spherical valve and other end shall remain free over the scroll casing with packings for sealing.	For Outlet pipe, we request you to accept S355 J2 +N Material. Kindly accept	**Bid stipulations shall prevail. Refer 'Note' at the end of Table 2 of clause 1.3.6.2.**
185	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6.3	Construction Details 1.6.3.9 Safety Arrangements	60 of 70	ii) It will be possible to invert the opening and closing movement of the valve in any position by activating the corresponding control circuit.	Hydraulic features/shape of main inlet valve internal components are designed for full open & full close condition only. Its not possible to invert the opening and closing movement of the valve in any position by activating control unit this may lead to uncontroled pressure rise. We request to delete this clause from Tender Specification.	**Bid stipulations shall prevail. However, may be discussed during Detail engineering.**
186	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.12.5	Tests on Steel Plates	68 of 70	The inlet valves shall be completely assembled and pressure tested in the shop a pressure equal to 150% of design pressure for 120 minutes to check the valves bodies strength. Leakage tightness of the repair seals shall be carried out at design pressure for 30 minutes. Servomotors and oil piping shall also be pressure tested at 1.5 times working oil pressure. Butterfly valves shall be thoroughly inspected, assembled and dimensionally checked. Their operation shall be demonstrated comprehensively covering all main working parts, accessories, attachments.	Pressure test duration will be as per clauses mentioned in IS 7326 (PART-1). Kindly accept.	**Bid stipulations shall prevail.**
Mechanical Balance of Plant (MBoP)							
187	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.5.4.12	Working Oil Pressure	52 of 70	ii) The normal working pressure for the governor oil shall be 100 kg/cm2 (max). For piston accumulator 120 bar system will be applicable. The OPU shall have high pressure compressed air system or piston type accumulator with nitrogen bottles battery.	To have optimized solution, bidder propose to use working pressure of governor in the range of 110 - 160 bar. Please accept.	**Agreed.**
188	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6 /1.6.1.11	Turbine Main Inlet Valves	53 of 70	1.6.1.11 The oil supply system will be designed for a working pressure of 100 Kg per cm2. For piston accumulator 120 bar system will be applicable. The MIVs, servomotor(s) piping and valves shall suit this oil pressure		
189	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.5.5	Specified spares	52 of 70	2. Main distributing valve, 2 nos. of each type	Main distributing valve is part of complete proportional valve assembly, so it is not considered separatrly, please confirm.	**Agreed.**
190	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.5.5	Specified spares	52 of 70	10. Jockey oil pump-motor set 1 no.	Jockey oil pump-motor set is not mentioned in the main technical description of turbine governor, please confirm the requirement.	**Irrespective of whether mentioned or not in the Main Technical Description, if the Jockey Pump is a part of the Governor Assemblies for Turbine and MIV as per the manufacturer's design, the spares shall be provided.**
191	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.5.5	Specified spares	53 of 70	25. Nitrogen cylinders, 1 set	Practically nitrogen cylinders are not required as spares, therefore not considered in spares, please accept.	**Bid stipulations shall prevail.**
192	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.6 /1.6.1.13	Turbine Main Inlet Valves	55 of 70	One emergency D.C. pump, for black start, complete with motor shall be supplied.	Bidder proposes to use Hand pump, instead of D.C. pump, Please accept	**Bid stipulations shall prevail.**
193	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.7.1/ (4)	Oil Pumps	63 of 70	The pumps shall operate intermittently to replenish the accumulator volume.	Contractor propose to select the pump as per IEEE125 standard, please confirm. Also please confirm the requirement of continuous running jockey pump for leakage compensnation in the system.	**Bid stipulations shall prevail.** **Bidder may provide detailed justification if not required.**
194	Volume II, Section II, Sub Sect 01 – Turbines, Governors and Main Inlet Valve	1.7.1.3	Leakage Oil Tank and Pu	64 of 70	An oil leakage tank, screw type pump and necessary piping and valves shall be provided .	Screw pumps are used generally where flow requirement is is on higher side, for leakage tank, flow requirement shall be on lower side, therefore bidder proposes to use gear pump, please accept.	**Bid stipulations shall prevail.**
195	Volume II, Sec- II, Sub-sec 03 Cooling water system	3.1	Scope of work	3 of 14	A) 3(Three) sets of cooling water systems (one set for each unit) for generator air coolers, thrust bearing oil coolers, guide bearing oil coolers and Oil Pressure Units of Turbine & MIV complete with pumps, duplex strainers, filters, heat exchangers, piping, valves, fittings etc. and other accessories for making the systems complete and for warranting a trouble free and safe operation.	As per Cooling water system flow driagram, drg. no. W.003159-20719-MD-7010 it is a open loop system, therefore heat exchanger is not required, please check the requirement & confirm.	**Bid stipulations shall prevail.** **However, Bidder may technically justify the exclusion.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
196	Volume II, Sec- II, Sub-sec 03 Cooling water system	3.1	Scope of work	3 of 14	C) As well as, supply of sufficient quantity of water for Air Handling Units of the HVAC System (if required) and Fire Water Storage Tank. The fire water tank shall be filled up from Cooling Water header from time to time, by running the cooling water pumps	As the pressure requirement of cooling water system & AHU's shall be different, it is proposed to have a dedicated filtration & pump arrangement for HVAC system. Also please confirm that the common header for cooling water system shall be at the suction side of the pumps, so that for fire fighting system can be operated without operating cooling water pumps.	**Bidder may propose alternate design if it meets all technical requirement. w/o any major change.**
197	Volume II, Sec- II, Sub-sec 03 Cooling water system	3.1.1	Design and Layout Conditions	4 of 14	Also the required water quantity shall be supplied / delivered to Fire Water Storage Tank through separate set of Motorized Automatic Online Self Cleaning Strainers and if required pumps (1 no. working + 1 no. standby).	Bidder proposes to supply cooling water to Fire Water Storage Tank through independent fire water filling system which will includse required components like valves, pump, filters etc., please accept	**To be decided during detail engineering.**
198	Volume II, Sec- II, Sub-sec 03 Cooling water system	3.4.2	Valves and Piping For Cooling Water And Shaft Seal Water Systems	10 of 14	All piping shall be of seamless carbon steel material and medium class.	As the system working pressure of cooling water system shall be on lower side i.e. approx. 6 bar, therefore seamless pipe is not required. Bidder propose to use ERW carbon steel pipefor water application, please accept	**Bid stipulation shall prevail.**
199	Volume II, Sec- II, Sub-sec 05 HP and LP Compressed Air System	5.2	General Requirements	3 of 7	A common HP & LP compressed air system shall be supplied for all the units of the Powerhouse. The compressed air system will be required for continuous or intermittent supply of air to cater the requirements of governor oil pressure for governing of turbine and low pressure air supply for generator braking for all the units.	As high pressure Oil-nitrogen accumulator system shall be used for governor oil pressure system & MIV OPU, so HP compressed air system is not required, please accept.	**Accepted.**
200	Volume II, Sec- II, Sub-sec 05 HP and LP Compressed Air System	5.2	General Requirements	3 of 7	AC motor driven air cooled reciprocating air Compressors, one acting as main and one acting as stand by for HP System, one acting as a main and one acting as stand by for LP system, and another one for the synchronous condenser mode; each of adequate capacity to cater above needs for the Powerhouse;	The operating pressure of HP compressure for synchronous condenser mode & LP compressor are different, so one main & one stand-by Compressor for both type of systems should be used. Please confirm.	**Accepted.**
201	Volume II, Sec- II, Sub-sec 05 HP and LP Compressed Air System	5.2	General Requirements	5 of 7	HP Air Receiver Nominal Pressure : 6.9 MPa Capacity : 2500 L Pressure Rating : 7.9 Mpa	Please note that the nominal pressure of HP receiver for synchronous condenser mode shall be approx. 80 bar & size shall be according to the system requirement.	**Accepted.**
202	Volume II, Sec- II, Sub-sec 09 Pressure shaft valve	9.8.3	Command Valves And Hydraulic System For The Servomotors	18 of 31	The pressurized hydraulic oil for the servomotors shall be provided by the high-pressure pumping unit for the associated TG unit.	Contractor propose to use working pressure of governor in the range of 110 - 160 bar. Please accept.	**Accepted.**
Electrical Balance of Plant (EBoP)							
203	Volume II, Sec- II, Sub-Sec. 6: Isolated Phase Busduct & Associated Equipment	6.5.1	Electrical Characteristics	7 of 28	Rated continuous current	The rated continuous current to be considered for Delta Bus is not specified in the Tender specifications. However, the recommended rated current for the Bus suitable for the system is 3500 Amps. Kindly confirm the same.	**The rating has been specified as '5000 A'.**
204	Volume II, Sec- II, Sub-Sec. 6: Isolated Phase Busduct & Associated Equipment Tender Drawing no. W.003159-20719-ED-7001	6.5	Main Isolated Phase Bus and Disconnect Switches- Ratings / Requirements	7 of 28	Main Isolated Phase Bus and Disconnect Switches- Ratings / Requirements	The disconnecting switches are not mentioned any where in the specifications and also not shown in the Tender SLD. It is requested to kindly remove the same from the specified clause.	**Please refer Clause no. 6.5.8 of PTS and Power House and substation main SLD, DRG. No. W.003159-20719-ED-7001.**
205	Volume II, Sec- II, Sub-Sec. 08: Protection and Metering	8.1.6.1 (b)	b. Product specifications i. Major Equipment List	36 of 153	PLCC-1 PLCC-2	It is understood that only the interface part with PLCC is in the scope of the Bidder. Kindly confirm the same.	**Confirmed.**
206	Volume II Section-II Sub-Sec. 08: Protection and Metering	8.1.1.3.	Components Details a. Unit Protection Boards (UPB-1, UPB-2 and UPB-3): e. Unit Bay Controller and Metering Board (BMB-1):	12 & 14 of 153	**a. Unit Protection Boards (UPB-1, UPB-2 and UPB-3** Panel-1 to include one Protection-A Generator Protection Multifunctional Numerical relay (ex: GE G60), one Transformer Protection Multifunctional Numerical relay (ex: GE T60), one Isolated Bus Duct Earth Protection relay c / w Bay Controller Display (ex: GE F650)..... **Unit Bay Controller and Metering Board (BMB-1):** BMB-1 is located in the Control Room; Panels-1 and 2 to include three (3) Production Bay Controller Units (BCU-GT1 to GT3) (ex: GE F650), three (3) Bay Production Energy Meters (BEM-1 to 3) (ex. Schneider ION7650), three (3) Breaker Control Switches (52CS-GT1 to3), three (3) Local-Remote Switches, CT circuit Test Switches, VT Test Switches, supervision relays, contact multiplication relays, ...	As the Bay controllers are to be considered with Unit Protection Boards as mentioned in tender specifications, the same are not required to be considered in the Unit Metering Boards. Kindly review the this requirement.	**To be finalised during detailed engineering as per standard practice.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
207	Volume II, Sec- II, Sub-Sec. 10: Medium & Low Voltage Switchgear and Auxiliary Power Supply System Tender Drawing no. W.003159-20719-ED-7003	10.1	Scope (MV Switchgear)	5 of 49	One (1) incoming supply feeder from 5000 kVA Transformer Two (2) outgoing feeders to SAT (Station Auxilliary Transformer)); One (1) outgoing feeder for transformers for remote Sites (intake gates location and Valve house; Two (2) outgoing feeders for local / colony distribution system; One (1) outgoing feeder (Spare); Bus PT as required for Each Bus Section	As per tender SLD there are two nos. of incoming supply feeders and whereas in the specifications only one no. is mentioned in specifications. The SLD shows the following incomer feeders: One (1) incoming supply feeder from 5000 kVA Transformer One (1) incoming supply feeder from Local Supply Kindly clarify the same.	**There will be two (2) nos incoming supply, one from 5MVA transformer and one from local supply.**
208	Volume II, Sec- II, Sub-Sec. 12: Emergency Diesel Generator sets	12.6.1.6	Diesel Engine Starting System	13 of 28	Starting battery shall not be less than 300 AH rating for DG set. If larger capacity is required for six successive attempts at the most unfavorable conditions, larger battery have to be installed. The battery charger shall be capable of boost charging the battery within 8 hours.	The starting Battery and corresponding charger are supplied as per standard practice by the Supplier in line with the DG set requirement and which can be smaller than 300 AH rating. Kindly accept the standard rating of the starting battery corresponding to the required capacity of the DG set.	**Shall be decided durinbg detail engineering as per the system requirements.**
209	Volume II, Sec- II, Sub-Sec. 13: Power and Control Cables Drawing no. W.003159-20719-ED-7003	13.1	Scope	3 of 13	➢ 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)	**The following cables shall be required and the distance may be assessed from the layout drawings provided.** **1. 220/33kV transformer (SST) to 33kV Power Supply Board (MVSSB)-1 set. (Double run)** **2. 33kV Power Supply Board (MVSSB) to 33/0.433kV, 1.5MVA (SSAT) - 2 Set.** **3. From 33kV panel to Pole structure near power house for Intake and Valve House power supply through overhead 33 kV line- 1 set.** **4. From Pole structure near Valve House to Valve house transformer- 1 set.** **5. From Pole structure near Intake to Intake transformer- 1 set**
210	Volume II, Sec- II, Sub-Sec- 16: Earthing System	16.2	System Requirements	3 of 11	The intent of scope is to supply, install 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: 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.**
211	Volume II Sec- II/Sub-Sec-16 Earthing System	16.2	System Requirements	3 of 11	The erection of earthing system shall have to be done with respect to the actual progress of work by civil contractors and slippage on this account shall not be acceptable.	The E&M contractor shall not be responsible for the delays attributable to the Civil Contractor. Kindly accept the same.	**Erection of earthing and civil works are correlated and parallel activities and civil progess should not be hampered due to slipage of E&M contractor.**
212	Volume II, Sec- II, Sub-Sec-.17: Illumination System	17.1	General	4 of 25	.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.	It is requested to Kindly provide the length of roads where the illumination to be considered by the Bidder.	**Illumination requirement for approaches to Power House, Dam Site, Valve House, Pothead yard shall be 500 m each**
213	Volume II, Section-III, Schedule of Requirements (SOR)		General			As the Gas insulated switchgear system is not in the scope of the Bidder, it is understood that the cables between the GIS and Local control cubicles shall be provided by the GIS supplier being a part of complete GIS package. Kindly confirm the above understanding.	**Confirmed. However cable from E&M contactors panel to LCC of GIS shall be in the scope of E&M contractor.**
214	Volume II, Section-III, Schedule of Requirements (SOR)		General			As all the Transformers are not in the scope of the Bidder, it is understood that the cables between the indidicual Single phase Generator step up Transformer marshalling box including the Common Marshallink box and the cables interconnecting between the same shall also be a part of complete Transformer package. Kindly confirm the above understanding.	**Confirmed.**
215	Volume II, Section-III, Schedule of Requirements (SOR)		General			As the PLCC system is not in the scope of the Bidder, it is understood that the coaxial cables related to this system shall also be provided by the PLCC system provider. Kindly confirm the above understanding.	**Confirmed.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
Quality							
216	Volume II Sec- I, General Tech. Specification	5.4.11	Site Test	Page 76 of 125	**Site Test:** Measurement of polarization Index	Kindly note that Only Insulation resistance is applicable. PI is not applicable as per IS 325.	**Accepted.**
217	Volume II Sec II Sub-Sec 08 Protection and Metering	8.3	c. Pre-FAT & FAT Activities	Page 128 of 153	**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;	PI. note 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.	**Accepted.**
218	Volume II Sec II Sub-Sec 08 Protection and Metering	8.3	d. Factory Tests (FAT)	Page 128 of 153	d. Factory Tests (FAT) 1. Type Test Certificates	Type test cerficate shall be provided for numerical realays only as received from the relay's manufactures. Kindly accept.	**Type Test report of the items, as applicable, including numerical relay received from manufacturer shall be accepted.**
219	Volume II Sec II Sub-Sub-Sec- 11- DC System and UPS System	11.7.6	Tests	Page 35 of 43	Tests • Burn –In Test for Printed Circuit Boards (PCB); Heat Run Test (Type test); •Audible Noise (Type test)	PI. note that Contractor will provide equivalent type test report for review. Kindly accept.	**Bid Stipulation shall prevail.**
220	Volume II Section II Sub-Section 1 Turbines, Governers and Main Inlet Valve	1.13		68 of 70	All welding on pressure carrying parts, such as scroll case, MIV inlet and outlet pipe etc., done at site shall be subjected to 100% radiographic examination.	Please note that UT & RT both are suitable to detect internal discontinuities. UT is preferred over RT due to health hazards. UT in lieu of RT is acceptable by all customer as a standard practice. So kindly accept the same.	**Accepted.**
221	Volume II Section II Sub-Section 2 Generator and Excitation System	2.3.11.2	Shop Tests	43 of 72	**Shop Tests** Thrust and guide bearings white metal- physical and mechanical properties;	Please note that only chemical test is applicable on white metal as per ASTM B23. Mechanical test is not applicable. Kindly accept	**Agreed subject to submission of Test Reports of physical and mechanical properties.**
222	Volume II Section II Sub-Section 2 Generator and Excitation System	2.3.11.4	Wet Commissioning Tests	45 of 72	**Wet Commissioning Tests** Sudden short circuit test from not less than 0.50 rated terminal voltage to determine reactance and time constants;	Please note that the sudden short circuit test is a special test coming under destructive category kind of test so we does not recommend to perform the same. Request to waive off the test.	**Bid stipulations shall prevail. However, the requirement may be reviewed during detailed engineering.**
223	Volume II Section II Sub-Section 9 Pressure Shaft Valve	9.11.1	Performance Test	21 of 31	**Performance Test** The valve shall be tested in a fully assembled condition along with hydraulic power pack and control panel.	Please note that final performance test of the Valve is performed using shop arrangements. However, hydraulic power pack and control panel. will be tested at manufacturer separately due to different manufacturing schedule..	**Bid stipulations shall prevail. However, the requirement may be reviewed during detailed engineering.**
224	Volume II Section II Sub-Section 9 Pressure Shaft Valve	9.11.5	Operational Test At Site	23 of 31	**Operational Test At Site** **I) Valve and Flanges: Components** e) Performance test with actual power pack	Please note that final performance test of the Valve is performed using shop arrangements. However, hydraulic power pack and control panel. will be tested at manufacturer separately due to different manufacturing schedule..	**Bid stipulations shall prevail.**
225	Volume II Section II Sub-Sec-19 EOT Cranes	19.10.2.5	Performance requirements	2	**Performance requirements:** iii) The vertical deflection of the main girders caused by the rated load plus all dead loads not to exceed 1/1000 of the crane span.	Please note that permissible deflection will be as per the approved drawing during detail Engg. Kindly accept.	**Bid stipulations shall prevail**
226	Volume II Section II Sub-Sec-20 EOT Cranes	19.9	Inspection, Shop Assembly and Match Markings	33	**Inspection, Shop Assembly and Match Markings:** Shop tests (to be inspected) shall include chemical and physical tests on castings, X-ray tests on welds and general inspection of all important casting.	Please note that UT & RT both are suitable to detect internal discontinuities. UT is preferred over RT due to health hazards. UT in lieu of RT is acceptable by all customer as a standard practice. So kindly accept the same.	**Bid stipulations shall prevail**
Pressure Shaft Valve							
227	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.3	PPV Main Data	7 of 31	Bypass assembly: Minimum dia. 250 mm and equipped with hydraulically operated Needle Valve; Manual Gate Valve for isolation; Flexible Expansion Joint	Based on our experience in previous projects, we do not recommend for dismantling joint in bypass system, technicaly it leads to excessive vibrations and leakage. We propose to follow bypass system design without dismantling joint. Kindly accept our proposal.	**To be decided during Detail Engineering.**
228	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.4	Performance Requirements	8 of 31	b) Emergency Condition: It includes total rupture of the penstock resulting in 100% pressure difference on the two sides of the valve as well as Slam Shut, Malfunctioning of Control Equipment in the most adverse manner resulting in odd situation of extreme loading.	For design of valve, as per standard practice 2 times of maximum discharge will be considered as total discharge for penstock rupture condition . Please review and accept the above consideration.	**Bid stipulations shall prevail.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
229	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.1	Valve Body	9 of 31	The construction of valve body shall be made in a single/two piece flanged together, reinforced with ribs, brackets and sole plate for anchoring to the foundation. The features of construction shall be as per IS: 7326 (Part I&II)/AWWA C-504. The material for the valve body shall be of carbon steel conforming to ASTM A537 Gr.2 or A516 Grade 70. The fabrication work shall be done so as to fully meet the provisions of ASME Section VIII Division I or equivalent. The interior of the valve body shall be smoothly finished so as to have low resistance and a free & full flow is ensured through the system.	We propose for following materials: (S355 J2+N) + (ASTM A216 Gr. WCC or IS 1030) i.e Cast +Fabricated design . Kindly accept our proposal.	**Any alternative material offered must be equivalent or better than the material specified in the Tender specification both in terms of chemical composition and material properties. However, the detailed comparision of Chemical composition and material properties much be submitted to the Purchaser for approval during detail engineering stage.**
230	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.2	Valve Disc	10 of 31	.....The disc shall be cast-fabricated/fabricated in single piece. The material shall be of carbon steel confirming to ASTM A537 class II or A516 Gr. 70, in case of fabricated steel. The disc shall be stress relieved before machining. The centerline of the valve disc shall be slightly off center to the valve body center line to provide a hydro-dynamic closing to the valve.....	We propose for following materials: (S355 J2+N) + (ASTM A216 Gr. WCC or IS 1030) i.e Cast +Fabricated design . Kindly accept our proposal.	**Any alternative material offered must be equivalent or better than the material specified in the Tender specification both in terms of chemical composition and material properties. However, the detailed comparision of Chemical composition and material properties much be submitted to the Purchaser for approval during detail engineering stage.**
231	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.3	Valve Shaft, Bearings and Shaft Seal	11 of 31	.....The shaft seal at each end shall preferably be of the gland and stuffing box type. The stuffing box shall be easily accessible for adjustment and replacement of packing without disturbing any other part of the valve.....	As per standard and proven design, two special seals are provided at each trunnion shaft location with self lubricating bearing, refer enclsoed image. We will offer same design of trunnion shaft for this project. Exact details will be shared during detail Engineering. Kindly accept our proposal.  	**To be decided during Detail Engineering.**

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
232	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.4	Valve Seals	11 of 31	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 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.....	We propose to offer maintanance and service seal on bipalne lattice type discs as per following image . Service seal will be self-engagement type while maintenance seal will be applied by giving sliding movement to seal seat of maintance seal by manuall operation . Kindly accept our proposal. Permissible leakge will be as per leakage clause mentioned in IS 7326 (PART-1).  	**Bid stipulations shall prevail.**
233	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.9.2	Downstream Pipe piece, Dismantling section-cum-expansion joint	13 of 31	.....The upstream and downstream pipe pieces shall be of fabricated steel construction of ASTM A537 class II/ A516 Gr. 70 and shall be supplied with a trim allowance of minimum 200 mm for edge preparation and welding. Any alternative material offered must be equivalent or better than the material specified in the Tender specification both in terms of chemical composition and material properties. However, the detailed comparison of Chemical composition and material properties must be submitted tothe Purchaser for approval during detail engineering stage.	We propose for offer S355 J2+N for shell and flanges and in case flange thickness is more than flange will be of cast materail ASTM A216 Gr. WCC or IS 1030. Kindly accept our proposal.	**Any alternative material offered must be equivalent or better than the material specified in the Tender specification both in terms of chemical composition and material properties. However, the detailed comparision of Chemical composition and material properties much be submitted to the Purchaser for approval during detail engineering stage.**
234	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.6.11	Penstock rupture detecting device	15 of 31	A penstock rupture detecting device shall be provided, which would close the valve under penstock rupture for safe guarding the power house from flooding.	We will offer Over Velocity device which will give signal for closing incase of higher velocity than usual and accordingly, valve closing command will be activated .	**Bid stipulations shall prevail.**
235	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.7.3	Emergency Closing Sequence	17 of 31	Closing of the Valve in the emergency mode shall be initiated from the following conditions: i) Emergency closing of TG unit. ii) Penstock rupture condition, iii) Alarm from level sensors at MIV floor/ Drainage pit under floor flooding conditions.	For design of valve as per standard practise 2 times of maximum discharge will be considered as extreme discharge at penstock rupture condition. Kindly clarify.	**Agreed.**
236	Volume II, Sec- II, Sub-Sec-09, Pressure Shaft Valve	9.8.2	Actuating Mechanism And Counterweights	18 of 31	The actuating mechanism is a series of levers and rods that transmit the forces between the servomotors, the counterweights and the rotor trunnions. The actuating mechanism articulations shall be equipped with self-lubricating bushings and hardened martensitic stainless steel trunnions.	We will offer forged steel material for trunnions with stainless steel sleeve. Kindly accept our proposal.	**Bid stipulations shall prevail.**

<table>
<tr><th>Sl. No.</th><th>Volume / Section</th><th>Clause No.</th><th>Clause Name</th><th>Page No.</th><th>Description as per Bid Document</th><th>Bidder Comments / Clarification</th><th>NEEPCO Replies</th></tr>
<tr><td>237</td><td>Volume II, Sec- II,
Sub-Sec-09,
Pressure Shaft Valve</td><td>9.11.1</td><td>Performance Test</td><td>21 of 31</td><td>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.</td><td>At workshop its not possible to assemble hydraulic power pack and control panel as the size of Valve is very big . However we will show full opening and full closing of valve with the help of crane in workshop for 3 times as per IS 7326 .

The test required can be performed at site.</td><td>Bid stipulations shall prevail.</td></tr>
<tr><td>238</td><td>Volume II, Sec- II,
Sub-Sec-09,
Pressure Shaft Valve</td><td>9.11.2

9.11.3</td><td>Body Hydrostatic Test,

Disc Strength Test</td><td>21 of 31</td><td>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.

With one end of the valve open to atmosphere and the disc in the closed position, the valve shall be subjected to 1.5 times the specified design pressure or twice the maximum operating pressure whichever is higher for a period of 30 minutes. The test shall reveal no structural damage at any point. There shall be no permanent deflection in the disc near seal, which shall be demonstrated during its testing.</td><td>We wish to perform Body Hydrostatic Test & Disc Strength Test jointly by welding test dome on upstream extension pipe and applying service seal on downstream side and than 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.</td><td>Bid stipulations shall prevail.</td></tr>
<tr><td>239</td><td>Volume II, Sec- II,
Sub-Sec-09,
Pressure Shaft Valve</td><td>9.11.4</td><td>Seal Test</td><td>21 of 31</td><td>With one end of the valve open to atmosphere and disc in the closed position and valve shall be subject to maximum design pressure for a period of 30 minutes. The leakage from the seals shall be zero. Low presure leak test at working pressure shall also be carried out.</td><td>Permissible leakge will be as per leakage clause mentioned in IS 7326 (PART-1)</td><td>Bid stipulations shall prevail.</td></tr>
<tr><td>240</td><td>Volume II, Sec- II,
Sub-Sec-09,
Pressure Shaft Valve</td><td>9.12</td><td>Material of Construction Standards & Codes</td><td>24 7 25 of 31</td><td>
<table>
<tr><th>Valve Component</th><th>Material</th></tr>
<tr><td>Valve Body</td><td>Carbon Steel confirming to ASTM A537 class II or A516 Gr. 70</td></tr>
<tr><td>Valve Disc</td><td>Carbon Steel confirming to ASTM A537 class II or A516 Gr. 70</td></tr>
<tr><td>Valve Shaft</td><td>Forged Steel BS 29/EN9</td></tr>
<tr><td>Sleeves for Shaft(as per manufacturer std)</td><td>Hardened Stainless Steel
ASTM A 743 Gr. 6 NM or CA15</td></tr>
<tr><td>Maintenance Seal</td><td>Nitrile rubber of shore hardness 75° A</td></tr>
<tr><td>Service Seal</td><td>EDPM rubber of shore hardness 75° A</td></tr>
<tr><td>Seal "O" ring</td><td>Nitrile rubber of shore hardness 75° A</td></tr>
<tr><td>Seal Retaining ring</td><td>SS 410</td></tr>
<tr><td>Retaining Ring (Segments are not permissible)</td><td>AISI 316</td></tr>
<tr><td>Body Seat ring</td><td>SS 410</td></tr>
<tr><td>Companion Flanges</td><td>Carbon Steel confirming to ASTM A537 class II or A516 Gr. 70</td></tr>
<tr><td>U/s. & D/s. Pipe Piece</td><td>Carbon Steel confirming to ASTM A537 class II or A516 Gr. 70</td></tr>
<tr><td>Flange Nuts & Bolts for Valve (Body)</td><td>High Tensile Steel SS IS: 1367 CL 12/BS:970 817</td></tr>
<tr><td>Nuts & Bolts for
(By-pass Piping)</td><td>A 193 Grade B7 / 194 Gr 2H</td></tr>
<tr><td>Bypass Gate Valve & Needle Valve</td><td>Cast Steel ASTM A 216 Gr. WCB with SS trims</td></tr>
<tr><td>Bypass piping</td><td>Seamless Carbon Steel ASTM A 106</td></tr>
<tr><td>Flanges for Bypass piping</td><td>Carbon Steel ASTM A 105</td></tr>
</table>
</td><td>We propose to offer following material :

Valve Body - Cast Fabricated Design : S355 J2+N (Plate material) + ASTM A216 GR WCC (Cast material)

Valve Disc - Cast Fabricated Design : S355 J2+N (Plate material) + ASTM A216 GR WCC (Cast material)

Valve Shaft & Sleevess - Forged + SS Sleeve : 34CrNiMo6+QT / DIN EN ISO 683-2 (Shaft) + ASTM A240 Type 41500 / Equivalent (Trunnion Sleeve)

Seal Retaining ring : ASTM A240 Type 415 / Equivalent

Body Seat ring : Stainless steel overlay E309 material

U/s. & D/s. Pipe Piece - Fabricated : We propose for offer S355 J2+N for shell and flanges and in case flange thickness is more than flange will be of cast materail ASTM A216 Gr. WCC or IS 1030, 340-570.

Companion Flanges : S355 J2+N (Plate)

Nuts & Bolts for Valve (Body) : 34CrNiMo6+QT / DIN EN ISO 683-2 / Equivalent

Apart from above exact details all part will be shared during detail Engineering.
Kindly accept our proposal.</td><td>Any alternative material offered must be equivalent or better than the material specified in the Tender specification both in terms of chemical composition and material properties. However, the detailed comparision of Chemical composition and material properties much be submitted to the purchaser for approval during detail engineering stage.</td></tr>
<tr><td colspan="7">Commercial Queries</td></tr>
</table>

Sl. No.	Volume / Section	Clause No.	Clause Name	Page No.	Description as per Bid Document	Bidder Comments / Clarification	NEEPCO Replies
241	General				Transport limitations	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. It is further understand that any Upgradation and maintenance of all roads for access to and within Power House shall be NEEPCO responsibility.	**The Kamba-Tato-Mechuka Highway is being constructed by BRO as per the relevant specification.** **The project road from Kamba-Mechuka road to Tato-I Power House is being built as per the following specifications:** **i) Single lane carriage way width: 3.75M** **(ii) Minimum Formation width: 7.75M** **(iii) Maximum vertical gradient: 1 in 15** **(iv) Vertical Ruling gradient: 1 in 20** **(v) Minimum Radius of curvature: 20.0M** **Detail Geometric design shall be done as per IRC manual for hills road.** **The Steel Modular bridge over Yarjep river shall be of Load Class 40R having a clear width of 4.25 Metres. Therefore, dimensions of all the consignments shall be designed accordingly, to the extent possible. The maximum weight of the consignment shall also be finalized as per the Steel Modular bridge specifications.** **The bidder is requested to visit site and carryout detail survey to ascertain transportation constraints, if any, in the Kamba Mechuka Road as well as the project roads to Power House and Valve House.** **However, in the event that the dimensions and / or**

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Quality						
242.0	Particular Technical Specifications Volume II Section-I General Technical Specification	Page 48 of 125	3.10.2 Welding	6 = Welding performance test, executed during fabrication at site welding. Runoff plates shall be tack-welded to one end of the plate under work. The weld shall continue on the run-off plate (test plate), welded in the same manner and under normal working conditions. One test plate is required every 20 m of weld seam, but at least one of each weld type.	Please note that for site weld qualified WPS,PQR & Certified welder will be follow and Runoff plate is not envisazed with component welding. Kindly accept the same.	**Bid Stipulation shall prevail.**
243.0	Particular Technical Specifications Volume II Section-I General Tech. Specification	Page 52 of 125	3.11.3.2 Non-Destructive Examinations	Groove weld on tension butt joint - 100% radiougraphy Test Groove weld on compression butt joint - 100% radiougraphy Test	As per VOITH global HSE practices, RT is avoided due to health Hazards. UT is preferred over RT as both methds are equally efficient to detect internal discontinuties. So please accept UT in place of RT.	**Agreed.**
244.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 01 Turbine, Governors and	Page 29 of 70	1.4.1.2 Materials	The minimum Charpy V-notch impact strength at -10°C shall be 30 J, to be fulfilled by each of 3 specimens.	Please note that as per Voith design guide lines Impact test for Runner casting is done at 0°C with minimum average Impact strength of 50J. Which is suiting with the application requirement also. Hence proposed to accept the same.	**Bid Stipulation shall prevail.**
245.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 01 Turbine, Governors and Main Inlet Valve	Page 67 of 70	1.12.5 Tests on Steel Plates	ii) Three ISO, V-notch toughness tests at 0 deg.C. in the “thickness direction”.	Please note that applicable material test as per approved material standard during detailed Engg shall be followed. Kindly accept.	**Bid Stipulation shall prevail.**
246.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 02 Generator and Excitation System	Page 17 of 72	2.3.7.4 Stator Windings	Dissipation factor (tip-up) tests shall be carried out in the shop on each Roebel bar to establish the variation in power factor as a function of applied voltage within the range of 4 kV to 8 kV: - Bars having a dissipation factor in excess of 1.0 shall be rejected; - 80% of bars on each unit shall have a dissipation factor less than 0.6;	Please note the testing specification mentioned for dissipation factor tests seems to be non-standard as the the dissipation factor shall be checked in the range of 0.2Un to 1.2 Un. Where Un is the rated voltange. Hence we proposed to used the international standard IEC 60034-27-3 for testing of dissipation factor used	**Noted. IEC 60034-27-3 can be used. However, Bidder must ensure the acceptance limits are applied to the standard's defined Tip-Up calculation.**
247.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 02 Generator and Excitation System	Page 21 of 72	iv. Pole Construction, Insulation and Windings	After full completion of each pole, the winding shall be subjected to the following tests according to IS: 4722: Dielectric test at ten times the rated field voltage with a minimum of 1500 V; Shock-wave test to verify insulation between turns;	Please note that generally we used the international standard IEC / IEEE for the electrical testing of Pole/winding, hence we proposed to used in this project. Further the testing voltage shall be approved drawing / approved design during detail engg.	**Bid Stipulation shall prevail.**
248.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 02 Generator and Excitation System	Page 43 of 72	2.3.11.2 Shop Tests	Field coils and stator bars - winding resistance, insulation resistance, high potential tests. These tests shall be done on coils and bars before and after "winding in";	Please note that insulation resistance of stator bars is checked after the assembly in the stator core at site.Insulation resistance of individual stator bar is not practically fesible to check at shop. Please consider the same.	**Bid Stipulation shall prevail.**
249.0	Particular Technical Specifications Volume II Section-II Sub-Sec.03 Cooling Water System	Page 12 of 14	3.7 Work Shop Test	The pump, pipes and valves shall be routine tested as per relevant IEC/IS at the works of supplier. The Supplier is required to submit type test report and routine test reports of equipment.	Please note that Type test certificate is not applicable for pump, pipes and valves. Please note that routine test is applicable for same and same will be submit as to be specified in QAP. Kindly accept the same.	**Agreed**
250.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 19 EOT Cranes	Page 39 of 41	19.10.1 Test at Manufacturer's works	The crane shall be tested under load on hoisting and cross traverse motions	Please note that cross travling under load at manufacturer's works is not possible same to be performed at site. This is the general practice. Kindly accept the same.	**Agreed**
251.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 21 Fire Fighting System	Page 18 of 20	21.10 Shop Test	The Contractor is required to submit type test certificates and routine test reports of equipment.	Please note that type test certificate is not applicable for The pump, pipes, valves, Deluge system, sprinkler system, automatic detectors etc. These are standard boughout catalogue based items which selected as per approved Drawin/Datasheet. Routine test certificate as applicable in approved QAP will submit the same.	**Agreed**

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252.0	Particular Technical Specifications Volume II Section-II Sub-Sec. 23 Oil Handling Equipement	Page 8 of 8	23.5.2 Site Tests	Performance test of pump sets	Please note that at site Performance test is not required & not possible because Performance test is cunduct at Pump manufacturer's works , at site functional / operational test to be performed which is part of Feld Quality plan. Kindly consider the same.	**Agreed**