



KARNATAKA POWER CORPORATION LIMITED
(A premier Power Generating Company of Govt. of Karnataka)

CORRIGENDUM-1

No: KPCL/2018-19/PS/WORK_INDENT8374

Date: 01/04/2019

Karnataka Power Corporation Limited invites bids through GOK e-procurement platform www.eproc.karnataka.gov.in from the qualified bidders for the following brief scope of work:

"Design, Engineering, Manufacture, Quality Surveillance, Inspection & Testing at supplier's works, packing & forwarding, transportation, supply, delivery F.O.R. YCCPP site, unloading, receipt & storage, handling at site, erection, trial operation, testing, commissioning, conducting performance guarantee tests including painting and handing over of ZLD Plant comprising of waste water pre-treatment plant with UF-RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, Integrating ZLD scheme with main power plant and Essential Spares including insurance towards transit risk / storage / intra-site transportation and erection including O&M of Plant and Equipment for a period of one year for 1 x 370MW of Yelahanka Combined Cycle Power Plant of KPCL, Yelahanka, Bengaluru- 560064, in the State of Karnataka, India.

The following are the revised Calendar of bid events for two cover tender system due to **revision in PQR conditions.**

1.	Date of Publishing of ABN and BBN in i) www.karnatakapower.com ii) www.eproc.karnataka.gov.in	27.02.2019
2.	Last date and time for submission of technical bid cover-I along with EMD and Price bid cover-II through e-procurement cell.	22.04.2019 upto 17.00 Hrs
3.	Opening of Technical bids (cover-I)	25.04.2019 at 11.00 Hrs
4.	Opening of Price bids (cover -II)	Will be intimated later

Chief Engineer (Thermal Designs),
Karnataka Power Corporation Ltd.,
#22/23, Sudarshan Complex,
2nd Floor, Sheshadri Road,
BENGALURU - 560 009.
Tel: 080-22354346,
E-mail: : cetd@karnatakapower.com
eemyccpp@gmail.com
zld.yccpp@gmail.com
Web site: www.karnatakapower.com

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	
Notification no : KPCL/2018-19/PS/WORK_INDENT8374 Dtd: 27/02/2019	AMENDMENT TO PQR	Sheet 1 of 2

PRE-QUALIFYING REQUIREMENTS FOR THE ZLD PLANT TENDER IS AMENDED AS DETAILED BELOW:

Sl. No.	Existing	Amended as
1.	2.0 MINIMUM QUALIFYING REQUIREMENTS: The intending bidder shall satisfy the following minimum qualifying requirements. The intending bidder should have Designed, Engineering, Manufactured / Supplied, Constructed, Erected and Commissioned. a) Waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr. and b) Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr. The bidder shall have executed the above works in any Power Plant/ Industrial Projects/ Water supply Board/ Municipal Corporation (including Civil works) in preceding Five years reckoned from last date for submission of bids and the same shall be satisfactorily and demonstrably performed continuously for a minimum period of One year as on last date for submission of bids. As a proof of the above, the intending /Lead bidder and his consortium partner shall furnish the relevant satisfactory performance	2.0 MINIMUM QUALIFYING REQUIREMENTS: The intending bidder shall satisfy the following minimum qualifying requirements. The intending bidder should have a) Designed, engineered, manufactured / supplied, Constructed, Erected and Commissioned a waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr. and b) Designed, engineered, manufactured / supplied, erected and commissioned Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr. The bidder should have executed the above works combined or individually in any Power Plant/ Industrial Projects/ Water supply Board/Municipal Corporation in preceding Ten years reckoned from the last date for submission of bids and the same shall be satisfactorily and demonstrably performed continuously for a minimum period of One year as on last date for submission of bids. As a proof of the above, the intending /Lead

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	
Notification no : KPCL/2018-19/PS/WORK_INDENT8374 Dtd: 27/02/2019	AMENDMENT TO PQR	Sheet 2 of 2

	certificates, on letter head with Corporate Identification Number, signed by competent authority/CEO of respective Thermal Power Station / other major industries / water supply board etc. certifying the satisfactory performance of the equipment/ system supplied and installed by the bidder in respect of paras Sl.Nos.2 (a) and 2(b) above.	bidder and his consortium partner shall furnish the relevant satisfactory performance certificates, on letter head with Corporate Identification Number, signed by competent authority/CEO of respective Thermal Power Station / other major industries / water supply board etc. certifying the satisfactory performance of the equipment/ system supplied and installed by the bidder in respect of paras Sl.Nos.2 (a) and 2(b) above. The performance certificates mentioning continuous satisfactory performance shall be for a min of 1 Year within the latest period of 5 years only. (i.e. Should cover a minimum one year successful running period between 2014 to 2019).
2.	2.4. The lead bidder shall be responsible for the overall execution of work.	2.4. The lead bidder shall be responsible for the overall execution of work. (including Civil works for both RO and Crystallizer Systems).

Note: All other Pre-Qualifying requirements remain unaltered.



1X370MW YELAHANKA COMBINED CYCLE POWER PLANT - ZERO LIQUID DISCHARGE PLANT					
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019					
PRE BID MEETING HELD ON 22.03.2019					
AMENDMENT TO PRE BID QUERIES - REPLY					
SI No.	Cl. Ref.	Tender Description	Bidders' Query	Reply to Pre-Bid queries	Amended As
42	Volume-1 Part-2 ..SCC pg 85 of 88	Page no 8/11 1.06.01- Supply of all chemicals and Consumables required for one year of operation of ZLD is in KPCL scope	Please confirm whether equipment spares like bearings of Motor/Pumps/UF/RO Skid ports shall be provided along with consumables like Grease/Belts/oil and chemicals.	All Bidders to quote for 5 years of O&M of ZLD plant. Spares, consumables, speciality chemicals is in the scope of the bidder. Whereas bulk chemicals and power supply is in the scope of KPCL.	All Bidders to quote for 5 years of O&M of ZLD plant. Spares, consumables, speciality chemicals is in the scope of the bidder. Whereas bulk chemicals and power supply is in the scope of KPCL. O&M shall be extendable for another Five (5) years on mutually agreed terms and conditions based on factors like Price indexes, Consumption pattern of Spares & Chemical, Man power requirement etc.

1X370MW YELAHANKA COMBINED CYCLE POWER PLANT - ZERO LIQUID DISCHARGE PLANT				
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019				
PRE BID MEETING HELD ON 22.03.2019				
REPLIES TO PRE BID QUERIES				
Sl No.	Cl. Ref.	Tender Description	Bidder's Query	Clarification
VOL-I PART-I GENERAL CONDITIONS OF CONTRACT				
1	Pre-Qualification criteria	Having supplied a plant of capacity 3 m3/hr in last 5 years	The key to a successful ZLD is its reliability and availability. The older the plant more established the technology. We would request KPCL to consider installations on similar technology (MVR Crystallizer) that are older than 12 years as well.	Refer Amendment to PQR uploaded in e-portal.
2	Cl refer - Brief bid notification. 2.0 Minimum qualifying requirement	Tender Description - The bidder shall have executed the above works in preceding 5 years reckoned from last date of submission of bids.	Bidders query - Please consider: The bidder shall have executed the above works in preceding 10 years reckoned from last date of submission of bids. Many UF/RO/ZLD treatment plants were constructed from year 2010-11 onwards, we request you to consider.	Refer reply under Sl. No. 1
3	General Conditions of Contract	Minimum Qualifying requirements - "Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr) ".	We are requesting you to change the term as "Crystallizer cum Evaporator system & Salt Centrifuge of capacity not less than 3 Cum/hr)".	Bid specification prevails
4	Pre-Qualification criteria	The PQ requires construction experience in ZLD as a criteria	Most of the earlier ZLD units were built by technology providers who were not EPCs and supplied these projects on a technology delivery basis. Please consider deleting construction as a PQ requirement.	Refer reply under Sl. No. 1
5	Cl refer - Brief bid notification. 2.0 Minimum qualifying requirement	Tender Description - The bidder shall have executed the above works in any Power Plant/ Industrial Projects/ Water supply Board/ Municipal Corporation (including Civil works) in preceding Five years reckoned from last date for submission of bids and the same shall be satisfactorily and demonstrably performed continuously for a minimum period of One year as on last date for submission of bids.	Bidders query - We understand that the Lead bidder has to have prequalification of Waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr including civil works. Where as 2 (a) Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapor Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr doesnt involve much of civil works. Kindly confirm civil works for pre-qualification of 2 (a) only. Please re-confirm.	Refer reply under sl. No. 1.
6	Cl refer - Vol 1, Part I- GCC. ITB. Annexure 3. Consortium agreement. Clause 4. (a) pg 26 of 158.	Tender Description - Responsibilities and Liabilities:The parties will be responsible and liable to the company for the portion of their work.	Bidders query - Please confirm exclusivity of consortium partnership. One consortium partner with his available PQ and expertise of work can have partnership with only one lead bidder.	Consortium partner with his available PQ and expertise of work can have partnership with more than one lead bidder.

7	PQR	2.2.2 The Consortium Partner shall fulfill the minimum qualifying requirement as indicated in 2 b and the Proof of same shall be in the name of consortium partner only.	We request you to amend the consortium route to MOU (Memorandum of understanding) route. MOU route allows to have more options for competitive bidding. For the "Limited" companies, going for consortium required stake holders approval. Moreover the consortium will be mostly required for higher values. In this tender, the ZLD system is a low value bought out items like pumps, membranes etc. and we are the system integrator. As per the tender we stand guarantee and warranty. The agreement copies with the ZLD vendor along with their experience certificate will be submitted along with our bid. Many public/govt tenders are accepting MOU and we are also participating in many public tenders.	Bid specification prevails.
8	3.0 Financial Criteria:	ii. In case of consortium bid, Lead bidder and consortium partner (as per para 2.2.1 & 2.2.2) in their names should have in the last five years period i.e. 2013-14 to 2017-18 achieved in at least two financial years a minimum annual financial turnover of Rs.84.00 Crore and Rs. 56.00 Crore respectively. As a proof, the bidders shall furnish Copies of audited P&L Account and audited balance sheet duly certified by a Chartered Accountant to establish annual turnover requirement stipulated above.	We have requested the MOU instead of consortium. The approved vendor list was already indicated in your tender and we presumed that they are meeting this turnover criteria. During details engineering a suitable new vendor is proposed from our end then KPCL shall not stick to this turnover PQ since we, the lead bidder will take the complete responsibility as stated in your tender.	Bid specification prevails.
9	volume - I part - I	2.7 The consortium partner shall separately submit SD equivalent to 1% of the total contract value directly to KPCL in the KPCL format in addition to the SD to be submitted by the lead bidder.	We have requested the MOU route instead of consortium. I case of MOU, this clause shall not be applicable.	Bid specification prevails.
10	Brief Bid Notification Cl. No. 2.0 Pg.4/11	2.0 Minimum Qualifying Requirements The bidder shall have executed the above works in any Power Plant/ Industrial Projects/ Water supply Board/ Municipal Corporation (including Civil works) in preceding Five years reckoned from last date for submission of bids and the same shall be satisfactorily and demonstrably performed continuously for a minimum period of One year as on last date for submission of bids.	The waste water treatment plant for reuse in power plant is relatively new concept (i.e after MoEF norms dt.2015), hence, there may not be many running plants as per QR. Therefore, we request Customer to relax the condition of execution of works in preceding 5 years to preceding 8 years.	Refer reply under sl. No. 1

11	Brief Bid Notification Cl. No. 2.0 Pg.4/11	2.0 Minimum Qualifying Requirements The intending bidder shall satisfy the following minimum qualifying requirements. The intending bidder should have Designed, Engineering, Manufactured/Supplied, Constructed, Erected and Commissioned. a) Waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr. and b) Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr.	There are many other types of ZLD systems such as ATFD, MEE, MED etc. meeting the treated water quality specified in tender. Kindly accept other ZLD technologies also as there is limited vendors for proposed technology which will restrict competition.	Bid specification prevails
12	Brief Bid Notification Cl. No. 2.0 Pg.4/11	2.0 Minimum Qualifying Requirements The intending bidder shall satisfy the following minimum qualifying requirements. The intending bidder should have Designed, Engineering, Manufactured/Supplied, Constructed, Erected and Commissioned. a) Waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr. and b) Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr.	We presume that Agricultural run-off water is also accepted as Waste water to meet the specified Qualification requirement. Kindly confirm	Acceptable.
13	Brief Bid Notification Cl. No. 2.0 Pg.4/11	2.0 Minimum Qualifying Requirements The intending bidder shall satisfy the following minimum qualifying requirements. The intending bidder should have Designed, Engineering, Manufactured/Supplied, Constructed, Erected and Commissioned. a) Waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr. and b) Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr.	We presume that the specified 75cu.m/hr capacity is with respect to inlet capacity to Waste water pre-treatment plant. Kindly confirm	RO system of capacity not less than 75 Cum/hr. is specified.
14	Brief Bid Notification Cl. No. 18.0 i. Page no. 9 of 11	Earnest Money Deposit: EMD: Rs.70.00 Lakh (Rupees Seventy Lakhs only). The e payment shall be made for Rs 1.00 lakh (Rupees One Lakh only) (direct debit, credit card & National Electronic Fund Transfer (NEFT) or Over The Counter (OTC) only through AXIS/ICICI Bank and remaining Rs.69.00 Lakh (Rupees Sixty Nine Lakhs only) either in the form of crossed demand draft in favor of KARNATAKA POWER CORPORATION LIMITED, payable at Bangalore or Bank Guarantee from a Nationalized/Scheduled Bank on Rs 200/- stamp paper as per the KPCL Proforma.	We request KPCL to accept total EMD of Rs. 70.00 Lakh in the form of Bank Guarantee as per KPCL Proforma. Kindly accept.	Bid specification prevails.

15	Cl refer - Section A4 Volume 1 Part I GCC Sheet 77/102 13.3.2 iii), pg 129 of 158.	Tender Description - 25% of contract price for Erection & Commissioning (including GST & Duties/levies/cresses) will be released after completion of each mile stone activity.	Bidders query - Please specify the milestone payment mentioned under this clause.	Refer revised Schedule of Milestone - F2 enclosed.
16	Cl refer - Section A4 Volume 1 Part I GCC Sheet 50/102 3.30.1 pg 102 of 158	Tender Description - Time is of the essence and those obligations of Contractor referred to as "Milestones"	Bidders query - Please do correct time is the essence to time is important.	Time is of the essence and those obligations of Contractor referred to as "Time Schedule" / Project Schedule.
17	Cl refer - Brief bid notification point no X	Tender Description - Statutory Clearances required for the successful establishment and operation of the ZLD Plant, if any.	Bidders query - We shall provide all the required support in terms of documentation and presenting the design basis with authorities etc. but obtaining statutory clearance to be done by customer including CTE (establishment) and CTO (operations).	Concent for Establishment (CFE) and Concent for operation (CFO) shall be obtained by KPCL. Indicative list of clearances to be obtained by bidder is enclosed.
18	Vol -I, PartI, GCC, page 151 of 158		GCC section 3.0 - Other clearances/ approval. By KPCL.	Refer reply under sl. No. 17
19	Volume -1, Part-1..GCC pg 154 of 158	Page 102 ..Section A4	All actual direct costs incurred by contractor for getting NOC /Permits/ Clearances which are in scope of contractor ...shall be reimbursed on production of receipt of Payments. Please confirm?	Bid Specification prevails.
20	General	Statutory Clearance	Statutory clearance not be included in our bidder scope.	Refer reply under sl. No. 17
			1.3 Consents, licenses and approvals from relevant statutory authorities other than those obtained by the OWNER. Please list out specific documents.	Refer reply under sl. No. 17
			1.3 Taking approval of all statutory authorities e.g., Factory Inspector, Inspector of Explosives, Electrical Inspectorate etc. for respective portions of work under the jurisdiction of such statutes or laws Customer scope, please clarify?	Refer reply under sl. No. 17
21	Cl refer - Section A2 Volume 1 Part I GCC Sheet 10/11, pg 14 of 158.	Tender Description - IMPLEMENTATION PERIOD: The implementation period is stipulated as 12 (Twelve) months	Bidders query - Please note, the implementation period of 12 months is very less considering the quantum of work involved. However we would like to have implementation period shall 18-19 months from LOA (Design, engineering, Supply, install, commissioning and PG test)	Completion period is 14 months. Refer revised Schedule of Milestone-F2 enclosed.
22	General Conditions of Contract	Completion Period - 12 months	Since civil works and major equipments execution such as Evaoprator will be in the part of scope of work, kindly consider the time period of 15 months.	Refer reply under sl. No. 21
23	volume - I part - I	20.0 COMPLETION PERIOD: Completion period is 12 months including monsoon for the entire scope of work as specified elsewhere from the date of issue of LOA.	We propose 24 months as the completion period considering the quantum of work.	Refer reply under sl. No. 21

24	Vol -I, PartI, GCC, page 50 of 158		Date of bid submission Bidder requires date of extension till 16-5-2019 (16th, May 2019) due to estimate and fir detail for Civil, electro mechanical and other works. So that kindly extent the date.	Last date of bid submission is extended upto 22.04.2019. Refer Corrigendum.
25	Cl refer - Section A2 Volume 1 Part I GCC Sheet 2/11, 3.2 pg 6 of 158	Tender Description - The basic consideration and essence of the Contract is the strict adherence to the time schedules stipulated in the Brief bid notification.	Bidders query -The word essence to be replaced importance of the contract	This shall be read as "The basic consideration and essence of the contract is the strict adherence to the completion period stipulated in the brief bid notification".
26	Cl refer - Section A1 Volume 1 Part I GCC Sheet 1/2 pg 5 of 158	Tender Description - Integrating ZLD scheme with existing BHEL supplied main power plant	Bidders query - We would like to understand our scope of supply to integrate our ZLD System with existing BHEL supplied main power plant.	Please refer SECTION: C1, VOLUME-I PART-II-SCC, BROAD SCOPE, TERMINAL POINTS AND EXCLUSIONS - clause No. 3.0 Integration with the main plant.
27	Vol -I, PartI, GCC, page 38 of 158		Instruction to bidder Annexures, Bid evaluations Please clarify that if any chemical evaluation as part of bid evaluation to make bidder L1 basis.	Chemical evaluation is also a part of Bid Evaluation. Refer Schedule of Guaranteed Chemical Consumption - F14 enclosed.
28	Vol -I, PartI, GCC, page 101 of 158		3.27. Right of way and Facilities Right of Way and access, and permits by KPCL, equipment storage, office and other works of space required for ZLD system shall be provided by KPCL. Please clarify.	Noted
29	Vol -I, PartI, GCC, page 131 of 158		13.4.4 The Owner shall pay the Invoice amount within 30 days from the date on which the Owner / Owner's Representative received the Contractor's statement and supporting documents and the Owner shall pay the amount certified in the Final Payment certificate within 120 days from the date of issue of the Take-over certificate. KPCL to pay within 30 days from receipt of invoice submitted.	Bid specification prevails.
30	page 2 of 11 of BBN	E) Service water / makeup water	We need source of service / make up water with distance (Any treatment is require on makeup water ?)	Service / Make-up water shall be drawn from the RO-1 permeate stream.
31	Page 2 of 11 of BBN pg 43 of 158	Q) Illumination facility	The lighting pole is require for both / one side of road ? (Please specify the boundary of entire premises including road)	Based on the lux, requirement of lighting pole shall be decided by the bidder.
32	page 2 of 11 of BBN pg 43 of 158	S) Road Connections:- Main road is 7 mtr and sub road is 4 mtr width with 750 mm shoulder and storm water drain.	We need the road distance from all unit to KPCL exiting road and type of road (WBM / RCC)	Type of road shall be RCC.
33	page 2 of 11 of BBN pg 43 of 158	T) AC / Ventilation system for each building and control room / MCC room	Please specify for which buildings the AC unit are required.	AC / Ventilation system for Control room,PLC room,VFD room and office room shall be provided.
34	page 2 of 11 of BBN pg 43 of 158	Y) Drainage for rain / sewerage line	Please specify the distance for exiting KPCL pit / STP .	UGD shall be connected to existing STP which is located approximately 300m from the proposed ZLD plant.

35	Page 3 of 11 of BBN pg 44 of 158	CC) Other miscellaneous system	Require specific system list from KPCL	Bidder has to decide any other system which are required for successful commissioning of ZLD.
36	vol-i part-i general conditions of contract pg 130 of 158	13.3.4 Civil Works:	We feel 10 % hold back till PG test shall affect our cash flow and hence request revision of civil milestone payments as given below kindly consider .	Refer revised Payment Schedule enclosed.
37	GCC - clause no. 13.3 - Payment schedule, pg No. 130 of 158	i.) 10% of total contract price for civil works (including GST & Duties/levies/cesses)with interest of SBI 1 year MCLR + 6.15% per year as initial advance (if required by the bidder) along with Letter of Award (LOA) against the Bank Guarantee of the same value and Performance Bank Guarantee of 10% of contract value. The bank guarantee furnished towards advance will be released only after complete advance and interest are adjusted / recovered.	i.) 10% of total contract price for civil works (including GST & Duties/levies/cesses)with interest of SBI 1 year MCLR + 6.15% per year as initial advance (if required by the bidder) along with Letter of Award (LOA) against the Bank Guarantee of the same value and Performance Bank Guarantee of 10% of contract value. The bank guarantee furnished towards advance will be released only after complete advance and interest are adjusted / recovered.	Refer reply under Sl. No. 36.
		ii.) 55% (65% if advance not taken) of contract price for civil works (including GST & Duties/levies/cesses) on pro-rata basis progressively against joint inspection report at site. The interest will be recovered @ SBI 1 year MCLR + 6.15% per year on 10% of invoice value (advance paid) from each bill till complete advance is adjusted.	ii.) 65% (75% if advance not taken) of contract price for civil works (including GST & Duties/levies/cesses) on pro-rata basis progressively against joint inspection report at site. The interest will be recovered @ SBI 1 year MCLR + 6.15% per year on 10% of invoice value (advance paid) from each bill till complete advance is adjusted.	
		iii.) 25% of contract price for civil works (including GST & Duties/levies/cesses) will be released after completion of each mile stone activity.	iii.) 20 % of contract price for civil works (including GST & Duties/levies/cesses) will be released after completion of each mile stone activity.	
		iv.) 10% of contract price for civil works (including GST & Duties/levies/cesses) on completion of PG test of the plant	iv.) 5 % of contract price for civil works (including GST & Duties/levies/cesses) on completion of PG test of the plant.	
38	General Conditions of Contract	Payment terms for both Civil/Supply/Erection & Commissioning	We request the change the payment term as following: 10% advance interest free on submission of 10% ABG validity till supplies 80% including taxes on PRORATA SUPPLY within 7 days after receipt of material at site. 10% on Erection & Commissioning (PGTR).	Bid Specification prevails.
39	General Conditions of Contract Clause No. 13.3 pg 128 of 158	Payment Schedule		Refer reply under Sl. No. 36.
40	Volume -1, Part-1..GCC pg 128 of 158	Page no 76 of 102. 13.3 Payment Schedule	For Supplies ...last 10% hold back till PGTR and supply of all essential spares will affect our cash flows for this project. Request reduction of the same from 10% to 5% for this tender.	Bid Specification prevails. Essential spares supply is removed from the scope of work. Refer revised Payment Schedule enclosed.

41	Volume-1 Part-1 ..GCC pg 10 of 158	Page no 6/11 12.0 Fixed Price	Please confirm whether any statutory variations in GST shall be paid by the owner.	Any variation in GST is into the account of KPCL.
42	Volume-1 Part-2 ..SCC pg 85 of 88	Page no 8/11 1.06.01- Supply of all chemicals and Consumables required for one year of operation of ZLD is in KPCL scope	Please confirm whether equipment spares like bearings of Motor/Pumps/UF/RO Skid ports shall be provided along with consumables like Grease/Belts/oil and chemicals.	All Bidders to quote for 5 years of O&M of ZLD plant. Spares, consumables, speciality chemicals is in the scope of the bidder. Whereas bulk chemicals and power supply is in the scope of KPCL.
43	Volume -1, Part-1..GCC pg 26 of 158		Clause No. 5 - the venue of Arbitration venue shall be proposed as Mumbai instead of Bangalore.	Bid specification prevails.
44	Volume -1, Part-1..GCC pg 27 of 158		Clause No. 8- Governing law and Jurisdiction - ...Only the court of competent Jurisdiction in India shall have jurisdiction over any clause of action arising out of this agreementRequest for inclusion as " for competent Jurisdictional court as Courts at Mumbai "	Bid specification prevails.
45	Volume -1, Part-1..GCC 10(c). Other terms & Conditions pg 27 of 158		Clause No. 10 (c) :- " Consortium leader shall be liable to other parties for any direct, indirect, special, incidental or consequential loss or damage " ..request for deletion of said clause as we cannot make good of any indirect or any consequential loss or damages ... in case KPCL is not agreeing for deletion of the clause , we have to insist for a maximum liability cap of 50 % of the total basic contractual value. Otherwise it will be difficult for us to convince management for approval.	Bid specification prevails.
46			At many places it has been mentioned "Consortium leader" but in the recital the lead partner is defined as "Lead Bidder" so the consortium leader needs to be replaced either with Lead Bidder or with "Consortium Leader";	Bid specification prevails.
47	General Conditions of Contract	EMD	Kindly consider the EMD as 100% BG instead of Rs. Lakh as NEFT Transfer.	bid specification prevails
48	General	Lab Setup	We are requesting the lab setup in the Clients Scope.	bid specification prevails
49	General	Power of Attorney/ Letter of Authorization	We understand that no written Power of Attorney is required to be submitted by bidder along with its bid. Kindly confirm. In case Power of Attorney is required, the same shall be submitted in our standard format.	Noted

50	Brief Bid Notification Cl. No. 1.0 r) Page no. 2 of 11 GCC Cl. No. 1.1.23 Sheet no. 4 of 102, pg 56 of 158.	Operation & Maintenance of plant and equipment on 24x7 basis for a period of one year after handing over / issue of Notice To Proceed (NTP) as the case may be. Consumables and Chemicals are in the scope of KPCL during O&M period. "CONTRACT PERIOD" shall mean period of Twenty four (24) calendar months commencing from date of issue of Letter of Award comprising Twelve (12) calendar months of completion period or to the extent of valid extension permitted by the OWNER and 12 calendar months of Guarantee Period thereafter during which the 'CONTRACT' shall be executed as agreed between OWNER and BIDDER.	We understand that the O&M period and Guarantee Period will be the same in this tender and will run concurrently. Kindly confirm.	Refer reply under Sl. No. 42. O&M is for 5 years after taking over of ZLD plant. Guarantee period is 1 year after take over. For first 1 year, O&M period & Guarantee period will run in parallel.
51	Price Schedule Section-F1, Volume-3 Cl No. 3.0 Sheet 2 of 3	LUMPSUM PRICE FOR CIVIL WORKS: Lumpsum firm price for Civil Works including, supplies such as cement, reinforcement steel, structural steel, all construction materials, all foundation bolts etc. required for subject work including Design, Engineering and Construction of entire Civil works excluding GST and any other taxes.	All the civil supplies such as cement, steel and other construction material shall be billed as part of services along with applicable SAC code. Hence HSN code will not be applicable for Civil works. Kindly confirm.	Noted. Refer revised Schedule of Prices - F1 enclosed.
52	Vol.I, Part-I GCC Cl no. 13.4.1 Sheet no.79/102, pg 131 of 158	Mode of Payment All payments shall be released to Contractor directly through cheques / electronic transfer within 30 days of submission of invoices/ bills along with requisite documents.	We request KPCL to kindly make supply payment against the on sight letter of credit.	Bid specification prevails
53	Vol.I, Part-I GCC Cl no. 3.18.6 Sheet no.41,42/102 pg 94 of 158	The contractor shall submit a comprehensive list of all the goods to be imported into India under the Contract to enable the Owner to issue the project essentiality certificate with endorsement of project imports for availing concessional rate of Indian customs and import duties. Any additional liabilities for such custom and import duties or penalties thereon, due to any discrepancies in the list of goods furnished by the Contractor or any other lapse of the Contractor in this regard, shall be to the Contractor's account.	As per this clause, we presume that Nil excise and customs duty is applicable. Kindly confirm.	Custom duty shall be applicable for imported items.
54	Brief Bid Notification Cl. No. 16.0 Page no. 9 of 11	5. Last date and time for submission of technical bid cover-I along with EMD and Price bid cover-II through e-procurement cell. (12-04.2019 upto 17.00 Hours)	Kindly appreciate that quantum of work requires through co-ordination with the various agencies Vis a Vis Sub-vendor, Subcontractor which will require considerable amount of time. At present the due date of submission is 12.04.2019. Considering the aspects elaborated above, we earnestly request KPCL to extend due date suitably and minimum 4 weeks for submission of bid after receipt of pre-bid replies to provide most optimum prices.	Last date of bid submission is extended upto 22.04.2019. Refer Corrigendum.

55	19.2.4	Volume 1, Part 1, GCC, page no. 145 of 158	The Bidder proposes that Indemnity should not be carved out from the limitation of liability. Therefore, Bidder requests that the clause 19.2.4 is revised as follows: “19.2.4 Notwithstanding the foregoing limitations of liability, such limitations of liability shall not apply to (a) Any liability of Contractor stemming from the fraud or willful misconduct of Contractor or Contractor's employees. In addition, Contractor expressly acknowledges and agrees that any liability of Contractor provided for by the proceeds of the insurance maintained pursuant to the Contract including clause no. 6, or from Sub-Contractor's Warranties or Guarantees (which Contractor hereby covenants to diligently pursue and enforce), shall not be counted toward any of the foregoing limitations of liability.	Bid specification prevails
56	General		Please furnish the details of cost involved for construction power and Water.	Shall be provided by KPCL at free of cost.
VOL-I PART-II-SPECIAL CONDITIONS OF CONTRACT				
57	Vol I, Part II, Special condition of contract,83 of 88		Please clarify followings i) LD of non- availability shall be applicable based on redundant equipment provided in the specification only for availability of 95% monthly. ii) If LD levied in capital equipment for non-performance during PG test, that can be revised during O&M period and KPI parameter for O&M shall be reset with mutual discussion and agreed between KPCL and bidder(s).	i) Noted. ii) The final PG test values obtained and accepted will form the base for O&M contract.
58	Vol I, Part II, Special condition of contract,83 of 88		Cumulative Liquidated Damages for non-fulfillment of Guarantee values as mentioned in the relevant clauses of this technical specification are independent of each other and are applicable separately and concurrently subject to total maximum limit of 10% of the total contract value for operation and maintenance. O&M cumulative LD shall subject to total maximum limit of 5% of the total contract value operation and maintenance. Please clarify.	Bid specification prevails.
59	Vol I, Part II, Special condition of contract, pg 84 of 88		O&M cumulative LD shall be sole and exclusive remedy and Limit of Liability(LOL) is 100% of value of contract.	Bid specification prevails.
60	Volume-I Part II Special Conditions Of Contract pg 74 of 88	Data drawings to be furnished by the tenderer with the offer	Layout drawing showing the battery limits and various pipelines shall be prepared During Detail Engineering (DDE)	Noted.

61	Vol.I, Part-II SCC Cl no. 1.02 Sheet no.1/11 pg 78 of 88	SCOPE OF WORK	We understand that insurance during O&M is in the scope of KPCL. Please confirm.	Noted. The insurance during O&M contract for their staff is in the scope of contractor.
62	Vol.I, Part-II SCC Cl no. 1.01 Sheet no.1/11 pg 78 of 88	PERIOD OF OPERATION & MAINTENANCE The successful tenderer shall be responsible for Operation & Maintenance of plant and equipment on 24x7 basis for a period of one year after handing over / issue of Notice To Proceed (NTP) as the case may be. Consumables & chemicals are in the scope of KPCL during O&M period.	We understand that Power during O&M is in the scope of KPCL. Kindly confirm.	Power during O&M is in the scope of KPCL. Refer reply under Sl. No. 42
63	Vol I, Part II, Special condition of contract,83 of 88	1.04.03 LD for non-performance: If the contractor fails to achieve any one or more of the guaranteed values of the parameters indicated in Performance guarantee for 3 days in a month, KPCL will levy penalty at the rate of 1% of total contract value for the O&M subject to maximum of 5% of total contract value for O&M. If such deviation of parameters is observed for a period of continuously 3months, the O&M contract will be liable for termination.	ii) If LD levied in capital equipment for non-performance during PG test, that can be revised during O&M period and KPI parameter for O&M shall be reset with mutual discussion and agreed between KPCL and bidder(s).	The final PG test values obtained and accepted will form the base for O&M contract.
		1.04.04 LD for non-availability: The monthly system availability shall be minimum 95% during the O&M contract period. For every 1% drop in availability below 95% and upto 90% for the reasons attributable to the contractor, 1% of the total contract value for the O&M contract will be levied as a penalty subject to maximum of 5% of total contract value for O&M. If the availability factor is continuously < 90% for 3 months, then the O&M contract is liable for termination. In case of the system availability is less than 90%, the Successful tenderer shall carry out repair/ replacement/ modification of particular equipment/ system at his own cost within a period of 15 days and thereafter, bringing the system availability to the minimum guaranteed level of 95%. The availability of the system shall then be observed for one month after the repair/ replacement/ modification are completed to decide whether or not the stipulated requirement is met during this period. The Successful tenderer in the event of failure to restore shall extend the validity of Contract Performance Bank Guarantee suitably at his own cost till the matter is decided. In case after all such repairs and replacement, the availability of the system is still less than 90%, then the O&M contract is liable for termination.	i) LD of non- availability shall be applicable based on redundant equipment provided in the specification only for availability of 95% monthly.	Noted

64	Vol I, Part II, Special condition of contract,84 of 88	1.05.02 In addition to the above, KPCL shall be free to cancel the contract or a portion thereof and get the balance works executed through other agency or agencies at the risk and cost of the successful tenderer. In the event such action is taken, the successful tenderer shall be liable to pay KPCL for any loss, which the owner may sustain but he will not be entitled to any gain of such action made against default. The manner and method of such contract shall be at the entire discretion of the KPCL whose decision shall be final and binding. This right shall be without breach/without prejudice to the other rights of KPCL to recover damages for breach of contract by the successful tenderer.	O&M cumulative LD shall be sole and exclusive remedy and Limit of Liability(LOL) is 100% of value of contract.	Bid specification prevails.
VOL-III-SCHEDULES				
65	Vol III, Schedules, page 9 of 22		Should the performance values fall below acceptable level, the unit/sub- unit/equipment shall be reject by the KPCL and the successful tenderer shall be liable, Liquidate damage (LD) shall be sole and exclusive remedy only as well as Limit of Liability (LOL) to bidder(s) shall be 100% contract value, and there at the option of the KPCL, either to replace the unit/sub-unit/equipment or to pay compensation in addition to the liquidated damage as per contract or as may be agreed upon is no consequential damage over the LD cap of 10% contract value. Please clarify.	Refer revised Schedule of Guaranteed Parameters - F3 enclosed. It shall be read as "Should the performance values fall below acceptable level, the unit/sub- unit/equipment shall be rejected by KPCL and the successful tenderer shall be liable to replace the unit / sub unit / equipment failing which KPCL reserves the right to get it done from alternative sources at the risk and cost of the bidder".
66	Vol III, Schedules, page 11 of 22		Bidder has to furnish UF & RO projections certified by the OEM with their offer. Power consumption in their projections shall only be indicated by the bidder against power consumption at duty point and same shall be considered for bid evaluation purpose Please clarify following: 1. Whether original equipment manufacturer (OEM) or membrane manufactured certified the RO and UF membrane projection. 2. RO high pressure pump power consumption evolution as per indicated in the RO projection calculation or As per feed water specified tender specification with risk shall be taken by EPC without affecting any KPI of the system.	Refer revised Schedule of Guaranteed Power consumption - F4 enclosed. 1. Membrane manufacturers projections from KPCL preferred makes (Dow, Hydranautics, Koch, GE, CSM, INGE/BASF, LG) for RO and UF membrane shall only be considered. 2. UF feed pump / RO high pressure pump power consumption shall be based on UF / RO projection calculation which inturn is based on feed water parameters specified tender specification. 3. Bidder has to supply the same membrane to KPCL after award of the contract for which projection certificate was furnished during bid evaluation. 4. Membrane projections and Total system shall be designed based on the TDS indicated in the Table-2. (CMB water analysis) and not based on ionic loads.
67	Vol - III - Schedules pg 11 of 22	Guaranteed Power Consumption	Penalty will be levied at Rs. 7,93,439/- per kW differential over and above the total guaranteed power consumed. The penalty on power consumption is hgh. Kindly consider	Bid specification prevails

68	Vol - III - Schedules pg 8 of 22	Overall UF-RO system recovery - Guranteed Values - > 95%.	Kindly reconsider the recovery or shall we consider third stage RO with silica removal system to acheive the same	Overall RO system recovery shall be greater than or equal to 92%. Refer revised Schedule of Guaranteed parameters - F3.
69	Vol.III, Sec: F3, Schedules Pg.8 of 22	Schedule of Guaranteed Parameters - F3 Overall UF-RO system recovery: >=95%	UF system recovery is specified as 95% & RO system recovery specified as 95%. Hence, combined recovery of UF & RO cannot be >95%. Hence, We request Customer to revise this guarantee as Overall ZLD plant recovery.	Refer reply under sl. No. 68.
70	Vol III, Schedules, page 10 of 22	While guaranteeing the auxiliary power consumption the bidder shall necessarily include all continuously working pumps / equipment operating auxiliaries under this package (Intermittent operating equipment's shall not be considered).	Please clarify followings? 1) what is meant by intermittent operation basis? 2) Is there any intermittent operating hours basis? Example: The equipment greater than 1 hour(s) not an operation per day shall be considered as intermittent else considered as considered as continuous operation.	Refer revised Schedule of Guaranteed Power consumption - F4 enclosed. Intermittent operation equipments are excluded for Auxiliary power consumption such as HRSCC Sludge disposal system, UF backwash, PSF backwash, RO CIP, service water pumps, chemical dosing pumps, ventilation, Air conditioning, material handling, illumination etc.
VOL-II - BID DRAWINGS / DOCUMENTS				
71	vol-ii bid drawings & documents Table-2; 26-Oil & Grease pg 8 of 137	Oil & Grease CT Blowdown- 2.5 ppm RO Reject- 3.875 ppm N-Pit Reject- 0.4167 ppm	Oil & Grease is usually not encountered in RO Reject & Kindly recheck Oil & Grease parameter in effluents.	Oil & Grease in effluents are in traces only.
72	Vol II, Bid Drawings/Documents, page 3 of 137		PSF(1W+1S), schematic drawings i) 80m3/hr by pass line to CW make - wall line showed PSF(1W+1S) but there is nowhere mentioned any other than specification about bypass line requirement of PSF and this is mandatory. Please clarify?	It is mandatory to provide PSF(1W+1S) for bypass line also as per the tender specification.
73	Volume-II Bid Drawing Documents pg 3 of 137	Schematic ZLD System KPCL/BID DRAWING/001	Also, Schematic Drawing provided shows Sludge Drying Bed after Centrifuge. Since, the tender mentions Sludge Dewatering system which includes Thickener and Centrifuge, Sludge Drying Beds can be considered as sludge storage yard for further disposal of Sludge. Kindly confirm. Please also provide SDB construction specifications from SPCB, if any, to avoid ground water pollution.	Sludge storage facility of 10m3 shall be provided apart from Sludge drying bed.
74	Volume-II Bid Drawing Documents pg 4 of 137	KPCL/BID DRAWING/002	Kindly provide the area (dimensions) of proposed ZLD area marked in the Plot Plan. Also, please provide the AutoCad copy of the Plot Plan.	Area proposed for ZLD is approx. 6000 Sq m. Marked Plot plan (tentative) is provided.
75	vol-ii bid drawings & documents	Soil Test	1) SBC value not mentioned in attached report.	The approximate value of SBC (only for guidance) are as follows: Depth of foundation below FGL 1 to 2m - 16T/m2, 3m - 30T/m2, 4m-31T/m2. Conducting geotechnical investigation is in the scope of the bidder. This shall be carried out immediately after issue of LOA.

76			2) Please note that the all (42 Nos.) borehole which is located the attached drawing is not in the proposed ZLD Plant area please specify how do we carry out the civil design , Can we go ahead with same bore hole report for bidding .	Refer reply under Sl. No. 75
77			3) CBR value of located area is @4.5 to 10.8 for soaked condition with 2.5mm penetration but its out side from ZLD area , so its not applicable please confirm .	CBR value is given for guidance. Bidder has to ascertain the CBR value.
78	vol-ii bid drawings & documents		Ground LVL (NGL) / Contour drawings not provided please provide the same	Refer Contour drawing enclosed RL 895.500M shall be FGL, AND FFL SHALL BE 500 MM ABOVE FGL
79	vol-ii bid drawings & documents	Salt Drying Bed	Please confirm whether Construction of Salt drying bed is RCC ??	RCC.
VOL-I- PART-III - TECHNICAL SPECIFICATION				
80	vol-i part-iii technical specification, vol-ii bid drawings & documents: Tentative Zero liquid discharge scheme for YCCPP.	As per these document scheme mentioned is : HRSCC + PSF + UF + RO- I + RO-II , Crystallizer	Please note, considering the ZLD requirement with expected overall UF - RO system recovery of ≥ 95%, feed water quality etc. we would like to recommend alternate scheme as "High pH RO based ZLD system". Please confirm whether deviation to tender scheme is acceptable.	High PH-RO based ZLD system is acceptable provided bidder qualifies as per minimum qualification requirements specified for the tender. In this case bidder shall follow standard industrial practices and IS standards for specification of the High PH-RO equipments. WAC shall be in Na form.
81	Volume-I Part III Technical Specification 3.0 pg 21 of 402	Terminal Points and Exclusions	Take over Points for Drinking water, Fire water system, Steam, Instrument Air: Kindly provide tentative distance/length from the proposed ZLD area. We understand that Treated water from CW make-up tank to CW fore-bay is in our scope. Kindly provide tentative distance. (Battery Limit).	The tentative distances of the following take over points from the location of ZLD plant. Drinking water - to be tapped from the nearby point. Fire water - approx. 20m Steam - approx. 600m Instrument air - approx. 500m. CW make-up tank to CW fore-bay 600m.
82	vol-i part-iii technical specification: 3.0 Terminal Points & Exclusions pg. 21 of 402	Terminal Points	Provide battery limit conditions for below mentioned points: - Drinking Water - Fire Water.	refer reply under sl. No. 81
83	vol-i part-iii technical specification pg 57 of 402	4.2.4 FIRE WATER SYSTEM	We need the clarification on Fire pipe line :- pipe line running from underground or from structural rack, also need all road crossing / layout .	refer reply under sl. No. 81
84	Volume-I Part III Technical Specification 2.0 pg 15 of 402	Brief Scope of Work.	Existing Central Monitoring basin (CMB) of capacity 5600 m3. We understand that existing CMB of RCC construction is inside the proposed ZLD area. Please provide the location of CMB to enable us to design piping distance and pump heads.	Approx. distance from CMB to ZLD plant is 200m.
85	vol-i part-iii technical specification: 4.2 Process Description pg. 28 of 402	Primary Treatment comprising of Equalization cum collection tank, Flash Mixer, High Rate Solid Contact Clarifier, sludge drying plant.	Bidder understand that Equalization cum Collection tank is same as Central Monitoring Basin and the same is in KPCL scope. Kindly confirm.	Confirmed.

86	vol-i part-iii technical specification: 9. Reverse Osmosis System - Equipment Specification; Pg. No. 39 of 402	The proposed UF-RO plant shall be housed in a building. The building shall house Self-cleaning strainers, Cartridge filters, High-pressure pumps, UF modules, RO modules, various chemical dosing facilities, Permeate water pumps, chemical cleaning and flushing facilities and CIP system. The Tenderer shall plan the permeate tank outside the RO plant building. The building shall be provided with suitable material handling and ventilation facilities. All liquid chemical dosing systems shall be housed in a dyke area adjacent to UF-RO building. All solid chemicals storage and dosing systems shall be envisaged in a separate chemical house.	Bidder understand that Chemicals associated to RO & UF system will be located within the UF-RO Building. Acid & Alkali dosing systems will be placed adjacent to UF RO Building and in dyked area. Rest of the chemicals will be located in Chemical house.	Bulk chemicals storage, preparation, dosing facility etc. shall be located in chemical house. All other chemical dosing systems shall be placed in dyke area adjacent to UF RO building.
87	vol-i part-iii technical specification: 4.0 Technical Specification & Description of Work Pg. No. 24 of 402	Sludge thickener - 1No	Kindly confirm the requirement of Sludge Thickener, as there is mismatch in the requirement mentioned in "Technical Specification" , "Description of Work" & " List of Pre-Treatment and UF-RO Components".	Sludge thickner (1No.) shall be considered.
88	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF-RO Components. 11. Lime Dosing Pump Pg. No. 43 of 402	Lime Dosing Pumps Type: Diaphragm With Pulsation Dampener, Trough Plate and Calibration pot. MOC: SS 316	Since this is slurry applications and tendency of lime , bidder suggest to provide Centrifugal Pump with recirculation line for Lime dosing application. Also, accessories like Pulsation Dampner, Trough Plate & Calibration Pot will not be applicable for the same.	Bid specification prevails.
89	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF-RO Components. 14. Dolomite Dosing Pump Pg. No. 43 of 402	Dolomite Dosing Pumps Type: Diaphragm With Pulsation Dampener, Trough Plate and Calibration pot. MOC: SS 316	Since this is slurry applications and tendency of lime , bidder suggest to provide Centrifugal Pump with recirculation line for Dolomite dosing application. Also, accessories like Pulsation Dampner, Trough Plate & Calibration Pot will not be applicable for the same.	Bid specification prevails.
90	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF-RO Components. 21. Bulk Acid Unloading/ Transfer Pump Pg. No. 43 of 402	Bulk acid unloading/transfer pumps Type: Horizontal Centrifugal with all necessary accessories. Casing: SS; Impeller: SS	Bidder suggest to provide Acid Unloading/ Transfer Pump with MOC for Casing & Impeller- PP, as SS MOC is not suitable HCl.	Bulk acid unloading/transfer pumps MOC for Casing & Impeller shall be of PP.
91	Volume-I , Part-III - Page: 20 of 124 pg 43 of 402	List of pre-treatment and UF-RO Components: 21.Bulk acid unloading/transfer pumps - Casing - SS, Impeller - SS.	For acid unloading pump Stainless steel material is not compatible. Hence, we propose to provide PP (Non - metallic) Pumps. Please confirm.	Refer reply under Sl. No. 90
92	Volume-I , Part-III - Page: 20 of 124 pg 43 of 402	List of pre-treatment and UF-RO Components: 23.Bulk caustic unloading/transfer pumps - Casing - SS, Impeller - SS.	For caustic unloading pump Stainless steel material is not compatible. Hence, we propose to provide CS or PP (Non - metallic) Pumps. Please confirm.	Bulk caustic unloading/transfer pumps MOC -CS or PP is acceptable.
93	Volume-I , Part-III - Page: 22 of 124 pg 45 of 402	List of pre-treatment and UF-RO Components: 46.Caustic Dosing Pumps - Shaft : SS 316 Blade : SS 316	For caustic dosing Stainless steel material is not compatible. Hence, we propose to provide PP (Non - metallic) Pump. Please confirm.	Caustic Dosing Pumps MOC -PP is acceptable.

94	Volume-I, Part-III - Page: 23 of 124 pg 46 of 402	List of pre-treatment and UF-RO Components: 52.Caustic Dosing Pumps - Shaft : SS 316 Blade : SS 316	For caustic dosing Stainless steel material is not compatible. Hence, we propose to provide PP (Non - metallic) Pump. Please confirm.	Refer reply under Sl. No. 93
95	Volume-I, Part-III - Page: 23 of 124 pg 46 of 402	List of pre-treatment and UF-RO Components: 54.RO - Micron cartridge Filters (RO-MCF) -Body / Housing: SS 316 Cartridge: PP wound	Considering the inlet effluent quality , we recommend to provide FRP Housing with PP wound cartridges instead of SS 316. Please confirm.	Housing MOC of Catridge Filter Unit shall be CSRL.
96	Volume-I, Part-III - Page: 23 of 124 pg 46 of 402	List of pre-treatment and UF-RO Components: 69.RO - Micron cartridge Filters (RO-MCF) -Body / Housing: SS 316 Cartridge: PP wound	Considering the inlet effluent quality , we recommend to provide FRP Housing with PP wound cartridges instead of SS 316. Please confirm.	Refer reply under Sl. No. 95
97	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF-RO Components. -40. Agitators/ Mixer in Hypo Dosing Tank Pg. No. 45 of 402	Agitators/Mixer in Hypo Dosing Tank Type: Propeller type Speed : High Speed Vertical top entry Gear Operated With all required fixing accessories	Since the sodium hypochlorite will be in liquid form with 10 - 12.5 % concentration separate mixer is not required. Please confirm.	Noted.
98	Volume-I, Part-III- Page: 22 of 124 pg 45 of 402	List of pre-treatment and UF-RO Components: 40.Agitators/Mixer in Hypo Dosing Tank - Shaft : SS 316 Blade : SS 316	For Hypo dosing Stainless steel material is not compatible. Hence, we propose to provide PP (Non - metallic) Agitator. Please confirm.	Agitators/Mixer in Hypo Dosing Tank MOC -PP is acceptable.
99	Volume-I, Part-III - Page: 22 of 124 pg 45 of 402	List of pre-treatment and UF-RO Components: 45.Agitators/Mixer in Caustic Dosing Tank - Shaft : SS 316 Blade : SS 316	For caustic dosing Stainless steel material is not compatible. Hence, we propose to provide PP (Non - metallic) Agitator. Please confirm.	Agitators/Mixer in Caustic Dosing Tank MOC -PP is acceptable.
100	Volume-I, Part-III - Page: 22 of 124 pg 45 of 402	List of pre-treatment and UF-RO Components: 51.Agitators/Mixer in Caustic Dosing Tank - Shaft : SS 316 Blade : SS 316	For caustic dosing Stainless steel material is not compatible. Hence, we propose to provide PP (Non - metallic) Agitator. Please confirm.	Refer reply under Sl. No. 99
101	Vol1, Part III, Technical specification, 10. List of Pre-Treatment and UF-RO Components. page 45 of 402		40. Agitator/ Mixer for Hypo dosing system Bidder shall propose 10-12.5% of NaOCl concentration, so that Agitator /Mixer is not required, please clarify?	Noted.
102	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF-RO Components. 68. Cartridge Filter Feed Pumps for RO-stage-II Pg. No. 47 of 402	Cartridge Filter Feed Pumps Type: Horizontal Centrifugal with VFD with all necessary accessories	Bidder suggest to remove VFD for Cartridge Filter feed Pumps of RO-II as RO-II "High Presure Pumps" are provided with VFD.	VFD for Cartridge filter feed pumps not to be considered.
103	vol-i part-iii technical specification: 4.2.1.9 Reverse Osmosis System & RO HP Pump - Reverse Osmosis System Pg. No. 39 of 402 & 10. List of Pre-Treatment and UF-RO Components. 81. RO-CIP-MCF Pg. No. 48 of 402	Dedicated Chemical Cleaning System comprising of a Chemical preparation tank, a Centrifugal Pump in SS 316 Construction and a cartridge filter unit (CSRL) shall be provided. Body / Housing: SS 316 Cartridge: PP wound	Since there is mismatch in the requirement as per clasue no. 4.2.1.9 & clause no.10, Kindly confirm the requirement of Housing MOC of Catridge Filter Unit: CSRL or SS 316.	Housing MOC of Catridge Filter Unit shall be CSRL.

104	Vol1, Part III, Technical specifications, 4.6.2 Cartridge filter, page 69 of 402		Cartridge filter Material of construction: Carbon steel This specification(s) is contradicting Carbon steel verses SS316 of other pages of tender specification, please clarify what is the material of constructions?	Refer reply under sl. No. 103.
105	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF- RO Components. Pg. No. 47 & 48 of 402	67. RO Permeate Transfer Pump; MOC: SS 304 82. RO Permeate Transfer Pump; MOC SS 304 83. Permeate Transfer Pumps from Permeate tank to CW fore - bay	Kindly confirm whether 3 tags or 2 tags are envisaged for RO permeate Transfer Application.	Only Permeate Transfer Pumps (1W+1S) from CW makeup tank (RO Permeate tank) to CW fore bay is Envisaged.
106	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF- RO Components. Pg. No. 46 & 47 of 402 & 4.6.3 Design Criteria 4.6.3 High Pressure Pumps Specification of pumps Pg. No. 69 of 402	55. RO Feed High Pressure Pumps Type: Vertical Centrifugal (multistage) with all necessary accessories and VFD 57. Interstage Booster Pump – I Type: Vertical Centrifugal (multistage) with all necessary accessories. 58. Interstage Boost Pump – II Type: Vertical Centrifugal (multistage) with all necessary accessories. 70. RO Feed High Pressure Pumps Type: Vertical Centrifugal (multistage) with all necessary accessories and VFD 72. Inter stage Boost Pump (if required) Type: Vertical Centrifugal (multistage) with all necessary accessories. 4.6.3. Type: Multistage Horizontal centrifugal, (preferably of ring section casing, diffuser type)	Bidder understand that RO High Pressure Pumps & Inter Stage booster pumps of both horizontal & vertical orientation are acceptable to Owner.	RO High Pressure Pump of Both horizontal & vertical orientation are acceptable.
107	vol-i part-iii technical specification: 10. List of Pre-Treatment and UF- RO Components. -5. HRSCC Pg. No. 42 of 402 & 4.15 Design Criteria for Pre- Treatment Plant -RCC Clariflocculator Pg. No. 110 of 402	5. HRSCC- RCC Structural Turbine: SS 316, Scraper: SS 316, Weir: SS 316, All under water parts: SS 316, Handrail & bridge: MS- FRP, cheq. Plate: FRP coated. The clariflocculator shall also contain overflow weir, peripheral launder for collection of clarified water, sludge raking arms with MS scrapers and squeezes attached to the bladder, sludge drainage pipeline with telescopic arrangement, sludge chamber alongwith necessary instrumentation and protection system.	Kindly confirm the MOC of HRSCC/ Clariflocculator internals to be considered, as List of Pre- Treatment & UF RO component indicate as SS 316 & Design Criteria for Pre-treatment indicate MS.	MOC of HRSCC internals shall be of MS-FRP coated.
108	vol-i part-iii technical specification: 4.2.1 Main Components of the System 4. Pressure Sand Filter pg. 32 of 402 & 4.15 Design Criteria for Pre- Treatment Plant pg. 111 of 402	4.2.1. Valves used in frontal piping for PSF shall be pneumatically operated, diaphragm valve. 4.15. Double flanged butterfly valves with rack and pinion type rotary pneumatic actuators shall be provided for this purpose.	As there is mismatch in the requirements asked in the documents, Kindly confirm the type of Valve to be considered for frontal piping of Pressure Sand Filter.	Bidder shall decide the type of valve (Diaphragm / butterfly) to be provided.

109	vol-i part-iii technical specification: 4.0 Technical Specification & Description of Work Pg 25 of 402 & 4.15 Design Criteria for Pre-Treatment plant Air Blowers pg 114 of 402	Blowers for PSF Backwash - 2 Nos. (1W+1S). Three twin lobe type air blowers (Two working and one reserve) complete with accessories and piping shall be provided by the tenderer for air scouring of the filters. The air blowers shall be of oil free type.	Kindly confirm the requirement of air blower quantity, as there is mismatch in the requirement mentioned in "Technical Specification" , "Description of Work" & " Design Criteria for Pre-Treatment plant Air Blowers". Bidder understand that 2 nos. (1W+1S) blowers are to be provided for PSF air scouring application. Kindly confirm.	Blowers for PSF Backwash - 2 Nos. (1W+1S) shall be considered.
110	vol-i part-iii technical specification: 4.0 Technical Specification & Description of Work Pg 24 of 402 & 4.15 Design Criteria for Pre-Treatment plant Sludge Agitators pg 114 of 24	Sludge sump agitator - 1 No. 2 Nos. agitator assemblies shall be provided for installation in the open topped slurry storage tanks to ensure the following:	Bidder understand that Sludge sump is a single compartment sump and only 1 no. agitator is to be provided. Kindly confirm.	Sludge sump agitator - 1 No. shall be considered.
111	vol-i part-iii technical specification: 11. Zero Liquid Discharge Plant Process Description pg. 50 of 402	The salt drying system shall consist of Pusher type Salt centrifuge to achieve 20% moisture content.	Bidder propose Decanter instead of Pusher Type Salt Centrifuge, as 20% moisture content can be achieved in Decanter.	Bidder shall decide the type of salt drying system (Pusher / Decanter type) to achieve less than or equal to 20% moisture content.
112	vol-i part-iii technical specification: 11. Zero Liquid Discharge Plant Crystallizer pg. 50 of 402	The circulation loop of the crystallizer recirculates the crystallizer slurry and pumped by the VFD centrifugal crystallizer recirculation pump through the shell and tube crystallizer heater.	In the circulation loop, the recirculation flow is almost constant. Hence, bidder suggest to remove VFD requirement of Recirculation Pumps.	Bid specification prevails. VFD is required for Recirculation Pumps as the density and TDS of the brine varies with time, flow has to be regulated accordingly in the circulation loop.
113	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402	Crystallizer Mixer Feed Tank- Duplex SS 2507/ 6%Moly	The expected temperature will be low and chlorides in the feed will be within the tolerance limit of Duplex SS 2205. Hence, bidder suggest Duplex SS 2205 for MOC of Crystallizer Feed Tank.	Depending on the chloride content in the RO reject, bidder shall decide the MOC of crystallizer feed tank. Minimum MOC - Duplex SS 2205.
114	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402	Crystallizer Vapor Body- 6% Moly/ Inconel 625/ C-276	Bidder recommend MOC for Crystallizer Vapor Body as Super Duplex 2507.	Depending on the Chloride content and operating temperature bidder shall decide. Minimum MOC - SS 2507.
115	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402	Tube Sheets- Ti-2/Ti-12 / Ti-16 clad 316L SS / C-276	Bidder suggest additional option of Ti-1 clad 316L SS as MOC of Tube Sheets.	Noted.
116	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402	Centrate Tank Mixer- 6% Moly	Bidder suggest additional option of Super Duplex 2507 as MOC of Centrate Tank Mixer.	Noted.

117	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402	Centrate Pump- Cd4MnCuN	Bidder suggest additional option of A890 Gr5A as MOC of Centrate Pump	Bid specification prevails.
118	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402	Crystallizer Recirculation Pump- Cd4MCuN/ CK3MCuN/ Inconel 625	Bidder suggest additional option of A890 Gr5A as MOC of Recirculation Pump	Bid specification prevails.
119	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402	MVC- 2205 Casing, 2507 Impeller	Bidder recommend Casing of 316SS & Impeller of Duplex 2205 as MOC of MVC.	Bid specification prevails.
120	vol-i part-iii technical specification: 13. Indicative List of Equipment & MOC pg. 55 of 402		Bidder understand that, the equipment list is tentative. However, only those equipment will be provided which will be applicable as per design.	Noted.
121	vol-i part-iii technical specification:		Bidder understand that plant area classification is Non- Hazardous. Kindly confirm.	Non Hazardous.
122	vol-i part-iii technical specification: 4.20 LIST OF MAKES pg. 145 of 402		Bidder suggest additional Makes for equipment supplied. These makes are established and widely accepted in the water treatment industry.	Bidder shall supply the equipments of preferred Makes as far as possible. However vendor approval shall be obtained from KPCL before finalizing the Make (preferred makes or additional makes).
123	Vol1, Part III, Technical specifications,		Civil General requirements Can you please provide detail Fined Floor Level, Finished Ground level, Existing Ground level etc if any?	Refer Contour drawing enclosed RL 895.500M shall be FGL, AND FFL SHALL BE 500 MM ABOVE FGL
124	Vol1, Part III, Technical specifications, 4.6.3 - High pressure pumps Specification of pumps page 69 of 402		Specification of pumps Sufficient to maintain design output at 28 deg.C upto 15 years life cycle of R.O. element RO HPP head shall be selected 28-degree C as low temperature and membrane life shall be 3 year not 15 years. Please clarify.	Bid specification prevails. Design head of RO HPP shall be sufficient to maintain design output at 28 deg.C upto 15 years.
125	8. Vol1, Part III Technical specifications, 4.2.5 - Treated water for Reuse as Make-up. pg 58 of 402.		Treated water TDS is < 800 pm Please clarify following. Is there any specific requirement and reason Treated water for reuse as make up. ZLD plant, page 50 of 402 of combined RO permeate TDS is < 100 ppm guarantee? Please note that bidder can meet the CW make-up reuse water as per tender specification and requirements by providing TDS is < 300 ppm, and thus reduce the overall power consumption ZLD system, please check and clarify.	Raw water which is used for regular CW make up TDS is less than 800ppm. Blended CW make up water tank water should not have TDS more than 830ppm.

126	17. Vol1, Part III, Technical specifications, Process Design Basis. 11. ZLD plant, page 50 of 402	From the RO Crystallizer feed tank, 6m3/Hr of RO reject shall be transferred via Crystallizer feed pump (1W+1S) to Evaporator cum Crystallizer system, where it will further be concentrated to form the mixed salt which shall be dewatered further for disposal to landfill by owner. Please clarify following.	1. As per feed flow of 95 % over all UF and RO recovery, that the ZLD feed flow is 7.3 m3/hr to 7.5 m3/hr. 2. Volume II, drawing, Table 2, CMB combined parameter, based on that bidder can not able meet the 95% of UF and RO over all recovery with current scheme but we can able meet 90-92% current scheme of UF and RO recovery, hence expected total reject shall be 12 m3/hr. KPCL to provide the detail if any recommendations. 3. Bidder can offer alternate scheme to meet the 95% of UF and RO overall recovery with current tender specification, and appropriate scheme shall i) Inter stage lime, soda ash and dolomite chemical of clarification and ultrafiltration. (or) ii) High pH Reverse Osmosis system.	UF recovery not less than 90%, overall RO recovery not less than 92%. The alternate schemes suggested by the bidder is acceptable.
127	Vol1, Part III, Technical specifications, List of Pre-treatment & UF-RO components. RO stage II, page 47 of 402		RO high pressure pump and Inter stage Booster pump material Please note that RO stage II have feed TDS is 10,000 ppm (approx..) with high chloride, Sulphate with pH and given temperature of 28 deg C, so that, material of construct of pump SS316 shall not suitable, instead of bidder shall provide Duplex SS(2205), please clarify.	Duplex SS(2205) shall be considered for RO stage II, high pressure pump and Booster pump (Casing, Impeller, shaft, sleeves, wearing ring, base plate, fasteners etc.).
128	Vol1, Part III, Technical specifications, RO system I, List of Pre-treatment & UF-RO components. page 46 of 402		Interstage Booster pump I &II Bidder to select the inter stage booster pump requirements based on RO design with flux proper distribution, min. flow recommendation of RO design and feed pressure the inter stage RO, so that this shall be decided by bidder. Please clarify?	Noted
129	Technnical Specification - REVERSE OSMOSIS SYSTEM pg 38 of 402	RO Stage Pumps	Interstage Booste pumps requirement is based on the RO projections. Kindly confirm the requirement of inter stage booster pumps.	As per the process requirement bidder shall decide the requirement of inter stage booster pumps.
130	Vol1, Part III, Technical specifications, Terminal points & Exclusions 3.1.2 Electrical pg 22 of 402		3.0 a Tapping Power supply from existing 6.6kV switch gear as per scope mentioned technical specification (Electrical). Clarify whether 6.6kV/415V?	It is proposed to draw supply from two 6.6kV spare feeders. Bidder may refer to reply under sl. No. 199.
131	Vol1, Part III, Technical specifications Section-5.0, Electrical system, pg 148 of 402		5.0 6.6kv switchgear Scope of 6.6kv Switchgear by Bidder? please clarify.	Two spare feeders are provided at main switchgear room for drawing power for ZLD equipments. Bidder shall design a localised HT switchgear for distribution of power in both 6.6kV and 415V levels.

132	Vol1, Part III, Technical specifications 5.4.8- VFD, pg 197 of 402		5.4.8 safety margin of 115% for VFD driven motors Some vendors are not agreeing for safety factor for 115%, exception required. please clarify.	Bid specification prevails
133	Vol1, Part III, Technical specifications 6.15 Cables pg 321 of 402		6.15 Power cables to be supplied shall be 1100v grade, single core having wire armoring of aluminum and multicore cables having galvanized steel wire /stripe armoring with FRLS properties. Steel armoring is the manufacturer regular product, with aluminum armoring delay may happen .	Noted.
134	Volume-I Part III Technical Specification 4.0 pg 24 of 402	Technical Specification and Description of Work	Equipment/ Units mentioned for the description of works include xi.) Sludge Drying Bed.	Yes, Sludge drying bed should be provided in RCC and Brick.
135	Volume-I Part III Technical Specification 4.2- Process description, pg 28 of 402. and 4.15-Design criteria for pre-treatment plant, pg 110 of 402.	Process Description & Design Criteria for Pre-treatment Plant	Tender specifies High Rate Solid Contact Clarifier (HRSCC) as well as RCC Clariflocculator. We understand that Bidder can provide any of the two options. Kindly confirm. Also, please provide the Surface Loading to be considered for HRSCC and Clariflocculator.	Only HRSCC shall be considered.
136	Volume-I Part III Technical Specification 4.20-List of Makes pg 146 of 402	List of Makes	Kindly include the following UF-RO makes, which are renowned, in addition to the provided: 1. UF- Inge/BASF 2. RO- LG	Acceptable.
137	vol-i part-iii technical specification pg 341 of 402.	7.5. REFERENCES, CODES AND STANDARDS-sheet 8 of 69 Steel material testing	We need confirmation from KPCL for any Structural steel / reinforcements steel quality test which is supply from approved vendor list given in tender does not require any 3rd party test .	If material is procured from reputed and approved vendor, Manufactured test certificate shall be furnished.
138	Vol-I Part-III, "Terminal Points & Exclusions" Cl. 3.1.2 Sheet 2 of 3, Pg. 22 / 402	11kV ac construction power supply shall be provided from nearest substation	Kindly provide the distance of the substation from the proposed ZLD location	Approximately 500Meters
139	Vol-I Part-III, "Terminal Points & Exclusions" Cl. 3.1.2, Sheet 2 of 3, Pg. 22 / 402	2nos. 6.6kV 630A feeder shall be provided for use of bidder.	Kindly provide the distance of the 6.6kV switchboard / substation from the proposed ZLD location	Approximately 500Meters
140	Vol-I Part-III, "Terminal Points & Exclusions" Cl. 3.1.2, Sheet 2 of 3, Pg. 22 / 402	2nos. 6.6kV 630A feeder shall be provided for use of bidder.	We understand that existing cable trays & trenches shall be allowed for laying of cables from specified 6.6kV switchboard to the proposed ZLD premises.	Existing trench/Pipe rack may be used wherever feasible.
141	Vol-I Part-III, "Technical Description" Cl. 5.1.3 Sheet 4 of 135, Pg. 151 / 402	Rated output of each CT shall be not less than 15VA.	VA burden for the CT shall be as per actual design requirement. Kindly confirm.	Noted
142	Vol-I Part-III, "Technical Description" Cl. 5.8.1 Sheet 79 of 135, Pg. 226 / 402	2 spare feeders from 220V dc supply for control & protection can be obtained from main MCC room.	Kindly provide the distance of the specified MCC room from the ZLD premises.	Approximately 500Meters
143	Vol-I Part-III, "Technical Description" Cl. 5.8.1 Sheet 79 of 135, Pg. 226 / 402	2 spare feeders from 220V dc supply for control & protection can be obtained from main MCC room.	We understand that existing cable trays & trenches shall be allowed for laying of cables from specified 220V DCDB to the proposed ZLD premises.	Existing trench/Pipe rack may be used wherever feasible.

144	Vol-I Part-III, "Technical Description" Cl. 5.9.3 Sheet 80 of 135, Pg. 227 / 402	Power supply to the hoist shall be tapped from ACDB a shown in the SLD.	SLD / Single Line diagram for any electrical system is not found. Kindly provide the same.	Power supply to hoist shall be derived from Bidder New LT switchgear. SLD enclosed (Electrical)
145	General	Cable Tray supporting system	We understand that In case new cable tray is required for laying of incoming 6.6kV ac & 220V dc cables, existing cable rach / pipe gallery shall be allowed to use. Kindly confirm.	Existing trench/Pipe rack may be used wherever feasible.
146	General	HRSCC	HRSCC shall be provided with local bridge mounted Control panel as per standard industrial practices. LCP shall be comprising of starter feeders for the HRSCC mechanism loads. Common ON, OFF & TRIP status shall be communicated to PLC. Kindly confirm.	Noted.
147	General	Vendor List	Kindly provide the Approved List of Makes for Electrical Items. In absence of Approved List of Makes, we understand that equipment with any reputed make, conforming to relevant IS & having a valid test certificate shall be accepted. Kindly confirm.	Prefered vendor list is enclosed. However vendor approval shall be obtained from KPCL before finalising the make.
148	Volume-I Part III Technical Specification pg 363 of 402.	7.8.9 Pipe and Cable Racks & Pipe sleepers	We understand the bidder is free to decide the type of Pipe support (UG / Pipe Trestle / Pedestal).	It shall be decided during detailed engineering.
149	General Piping	Support Standard	We understand that the bidder is free to select the type of primary pipe support .	It shall be decided during detailed engineering.
150	General Piping	Under-Ground Piping	Kindly provide the existing Underground Piping Layout.	It shall be decided during detailed engineering.
		Existing Pipe route	Kindly provide the existing Piping layout pertaining to battery limit.	
		Under-Ground Piping	Kindly provide the minimum earth cushion required for underground Pipe. Also provide the details of Coating & wrapping required.	
151	General Piping	Pipe MOC & Pipe thickness	We understand the bidder is free to select the Pipe MOC & Pipe thickness as per design requirement.	It shall be decided during detailed engineering.
152	Volume-1 part-111	Instrumentation	Approved makes for PLC, field instruments, cables, on line analyzers has not been given in the tender.	Prefered vendor list is enclosed. However vendor approval shall be obtained from KPCL before finalising the make.
153	Technnnical Specification - REVERSE OSMOSIS SYSTEM pg 39 of 402	Antiscalant Dosing Tank MOC	Based on Pg. No. 39 Antiscalant Dosing MOC - MSRL, and in Pg No.24, FRP. Kindly confirm	Antiscalant dosing tank MOC - FRP
154	Technical Specification - List of Makes pg 146 of 402	Pressure Vessels & Tanks	Kindly consider the Ion Exchange Make?	Pressure Vessels & Tanks of Ion Exchange Make is acceptable.
155	Technical Specification - List of Makes pg 146 of 402	RO Membrane	Ion Exchange is manufacturing the BW and sea water membranes also. And also we supplied to major industries. Kindly confirm shall we consider In Exchange also?	Bid specification prevails
156	Technical Specification - List of Makes pg 146 of 402	UF membrane	Norit - Pent air is also one of the major UF membrane manufacture. Kindly cofirm shall we consider the same	Bid specification prevails

157	Technical Specification - Ultrafiltration Treatment pg 33 of 402.	Type of UF system shall be Pressurised or Sub merged one with membrane MOC of PVDF. Minimum 90% recovery shall be considered for the UF system with a minimum net flux rate of 50LMH @ 28 deg C with 3 year CLIF warrantee and 5 year pro-rata warrantee for UF Membrane	Requesting hollow fibre membrane of MOC - PES Membrane also. And also requesting for the system recovery in the range of 85-90%	Bid specification prevails. UF system recovery shall be greater than or equal to 90%.
158	Vol1, Part III, Technical specifications, UF system, page 44 of 402		UF recovery is 95% The UF recovery is contradicting 90% versus 95% as per tender specification in Volume1, Bidder shall offer min.90% recovery based on feedwater provided in the documents, please clarify.	UF system recovery shall be greater than or equal to 90%.
159	Volume-I , Part-III - Page: 15 of 124 pg 38 of 402	Reverse Osmosis System Pre-treated water after adjustment of pH and chemical conditioning shall be pumped by high pressure pumps (two working and one standby pump for two trains) into reverse osmosis trains (2 working trains with each streams of 50% capacity) with overall minimum RO system recovery of 95% with minimum net flux rate of 18LMH @ 28 deg C.	With reference to the feed effluent quality provided there shall be potential scaling and fouling of the reverse osmosis system. Hence shall be operated with a maximum recovery of 90-95%.Please confirm.	Overall RO system recovery shall be greater than or equal to 92%.
160	Technnical Specification - REVERSE OSMOSIS SYSTEM pg 38 of 402	RO system recovery of 95% with minimum net flux rate of 18LMH @28 deg C.	With the provided scheme of two stage RO System, 95% recovery is not acheivable. If we consider silica as <30 ppm (after silica in the pretreatment, we can acheive the recovery of 88% with the reject silica of 240 ppm, Shall we consider silica removal system (additional HRSCC) and third stage to acheive the recovery?	Overall RO system recovery shall be greater than or equal to 92%.
161	Volume-III , Section-F3 - Page: 8 of 22	Overall UF-RO system recovery ≥ 95%	Considering the conventional reverse osmosis membrane and Ultra Filtration membrane the maximum overall recovery possible shall be 80 - 85%. Hence, a recovery of 95% is not practically not possible. Please confirm.	Overall RO system recovery shall be greater than or equal to 92%.
162	Volume-I , Part-III - Page: 15 of 124, pg 38 of 402	Reverse Osmosis System Micron Cartridge Filter (6 Nos., 2 (1W+1S) for each RO HP pumps) shall be provided to remove fine colloidal suspended impurities, which has escaped from upstream units.	We presume that the number of cartridge filter mentioned in the tender is a typographic error. The number of micron cartridge filter shall be three number 3 Nos (2W+1S). Two numbers will cater to the two working RO system and one number shall be common stand by. Please confirm.	3 Nos micron cartridge filter one each for RO HP pumps.
163	Technnical Specification - REVERSE OSMOSIS SYSTEM pg 38 of 402	Micron Cartridge Filter (6 Nos., 2 (1W+1S) for each RO HP pumps)	As per the PFD it is 2W+1S, Kindly confirm the quantity of MCF, whether it is based on no. RO HPP or based on no. Of trains of trains with one stand by MCF.	3 Nos micron cartridge filter one each for RO HP pumps.
164	Volume-I , Part-III - Page: 16 of 124 pg 39 of 402	Reverse Osmosis System Reject line piping shall be Duplex SS	Duplex stainless steel shall be provided only when the chloride content in the RO reject is more than 2500 ppm. If the chloride is less than 2500 ppm, SS-316 piping shall be provided. Please confirm.	Depending on the chloride content in the RO reject, bidder shall decide the MOC of Reject line piping. Minimum MOC- Duplex SS.
165	Volume-I , Part-III - Page: 28 of 402	3 year CLIF warrantee and 5 year pro-rata warrantee for UF Membrane	Based on our experience with UF membrane manufacturers, we shall provide 2 year CLIF warrantee and 3 year pro-rata warrantee for UF Membrane. Please confirm.	Bid specification prevails.

166	Volume-I , Part-III - Page: 30 of 402	Clarified Water Storage Tank The tank is provided with sufficient retention time and RCC of construction.	Please confirm the retention time to be considered for the design of Clarified water Storage Tank. We propose 30 minutes for clarified water storage tank.	Clarified Water Storage Tank shall be designed for 30 minutes retention time.
167	Volume-I , Part-III - Page: 32 of 402	UF feed tank and UF feed pumps UF feed tank is provided with sufficient retention time and RCC of construction.	Please note that this tanks MOC shall be MS with suitable coating/paint. RCC tanks will influence the SDI value and hence may not be suitable to feed the RO system. Please confirm. We propose retention time of 30 min.	RCC with epoxy coating shall be provided.
168	Volume-I , Part-III - Page: 33 of 402	Type of UF system shall be Pressurized or Submerged one with membrane MOC of PVDF. Minimum 90% recovery shall be considered for the UF system with a minimum net flux rate of 50LMH @ 28 deg C with 3 year CLIF warrantee and 5 year pro-rata warrantee for UF Membrane.	PES UF membranes is also well suitable like PVDF. Even as per the vendor list mentioned in the tender many are having only PES. Please confirm	Bid specification prevails
169	Volume-I , Part-III - Page: 37 of 402	7.RO feed tank and RO feed pumps RO feed tank is provided with sufficient retention time and of RCC construction.	Please confirm the retention time to be considered for the design of RO Feed tank.	Retention time shall be 30min for all tanks except for final RO reject tank which is 500m3 capacity.
170	Volume-I , Part-III - Page: 37 of 402	8.Micron Cartridge Filter (MCF) and RO feed pumps MCF shall trap colloidal particles up to a size of 3 microns. Micron filtration eliminates possibility of regular clogging of the membrane surface and is a standard prerequisite before RO membranes.	With reference to our experience in working with RO membranes, The RO membrane manufacturers recommend to provide a micron cartridge filter with 5 microns rating. Hence, we propose to provide 5 micron cartridge filter instead of 3 micron. Please confirm.	Micron cartridge filter with 5 micron rating is acceptable.
171	Volume-I , Part-III - Page: 40 of 402	RO train shall receive high pressure feed water through the control valve at discharge of each High Pressure pump	Since we are providing variable frequency drive for the High pressure pump, we don't recommend to provide the control valve at the discharge of the High pressure pump. Please confirm.	Bidder shall decide the requirement of control valve in the outlet of RO High pressure pump.
172	Volume-I , Part-III - Page: 48 of 402	82. RO Permeate Transfer Pump	Please confirm the capacity and head of the RO permeate Transfer pump.	Not envisaged.
173	Volume-I , Part-III - Page: 48 of 402	83. Permeate Transfer Pumps from Permeate tank to CW fore-bay	Please confirm the capacity and head of the Permeate Transfer Pumps from Permeate tank to CW fore-bay	Capacity of the pump shall be decided based on the total input to CW makeup tank. The approx. distance from CW tank to CW forebay is 600m.
174	Volume-I , Part-III - Page: 12 of 402	Transfer pumps from Central Monitoring Basin (CMB) Two pumps (1W+1S) are used to transfer the effluent from CMB. 150 m3/hr. is treated in the proposed ZLD plant. The balance 80 m3/hr. is pumped without treatment to CW make up tank (Bypass line).	Please provide us the head of the CMB Transfer pump to be considered for ZLD plant and for the Bypass line respectively.	Head depends on location and height of HRSCC and location of CW makeup tank. The approx. distance from CMB to ZLD plant is 200m.
175		ZLD Schematic	Based on our experience the proposed scheme will not cater the performance guarantee requirement. Hence, we presume that bidder is free to decide the process scheme meeting the functional guarantee requirement. Similarly we also don't anticipate the requirement of Sludge Drying Bed. Please confirm.	Noted. Sludge drying bed of RCC construction is required.
176	Volume-I , Part-III - Page: 11 of 402	In the ZLD system, the RO reject stream is sent to forced circulation Crystallizer cum Evaporator with Mechanical Vapor Recompression (MVR).	We presume that bidder is free to provide Multi effect evaporator (MEE) with either Thermal or Mechanical vapor compressor technology. Please confirm.	Bid specification prevails.

177	Volume-I, Part-III _ Page: 50 of 402	The feed to the Zero Liquid discharge Plant shall be the streams from RO reject from RO plant of the Tertiary treatment system which shall be transferred to Crystallizer feed tank via RO reject storage tank of 500m3 capacity. From the RO Crystallizer feed tank, 6m3/Hr of RO reject shall be transferred via Crystallizer feed pump (1W+1S) to Evaporator cum Crystallizer system, where it will further be concentrated to form the mixed salt which shall be dewatered further for disposal to landfill by owner.	The feed flow to the evaporator is mentioned here considering 95% recovery in the RO system. As per the prescribed procedure of RO membrane vendors, the max recovery will be tried to achieve through optimum design/procedure. Therefore, the feed flow to the ZLD system may vary in line with the max recovery achieved from the optimized RO systems.	Overall RO system recovery shall be greater than or equal to 92% and 6m3/hr Evaporator cum Crystallizer system is envisaged. Remaining RO reject will be stored in the RO reject storage tank of 500m3 capacity. 92% and 6m3/hr. indicated in the bid document is min and max values for RO recovery and Crystallizer capacity respectively. However, KPCL desires to have better RO recovery and lesser crystallizer capacity for reducing capex. in view of this, bidder shall try to design the system to achieve max recovery and least possible RO reject quantity by adopting suitable technologies.
178	Volume-I, Part-III - Page: 59 of 402	4.3.1 PIPING SPECIFICATION Feed pipelines from HRSCC, UF up to RO-1 Suction shall be of CPVC/GRP	Pipe line up to RO High pressure pump suction is of low pressure hence PVC/GRP pipes shall be used up to each RO high pressure pump suction instead of RO feed pump suction.	Feed pipelines from HRSCC upto UF - CPVC. UF to RO-1 HP Suction shall be of CPVC/GRP.
179	Volume-I, Part-III - Page: 334 of 402	GEOTECHNICAL INVESTIGATION REPORT-----PE-DC-409-602-C001	In Many places it is mentioned as Geotechnical Investigation however we are unable to locate this document. Please guide us to locate this document for estimating our civil units.	Geotechnical Investigation is for the other parts of the YCCP plant. For ZLD area seperate investigation along with report shall be provided by the successful bidder. The approximate valuses of SBC only for guidance shall be as follows: Depth from FGL SBC 1 to 2m 16t/m2 3m 30t/m2 4 to 5m 31 t/m2
180	Volume-I, Part-III _ Page: 145 of 402		We propose the following additional vendors as of now however we may also propose the some more reputed vendor during details engineering stage if we become the successful bidder. Evaporator - Mojj industries RO High pressure pump - ITT HRSCC - BGR UF Membrane - Membrane Hitech, INGE Pressure vessel and tanks - BGR Mechanical Vapor Compressor - As per ZLD vendor.	BGR make for HRSCC, pressure vessel and tank is acceptable. All other items shall be as per list of makes indicated in the bid document.
181	Vol.I, Part-III pg 13 of 402	Zero Liquid System Crystallizer RO reject waste from RO reject storage tank shall be fed into vapour compressor through Evaporator cum Crystallizer feed tank. Provisions shall be made to add Sulphuric acid or HCL / Caustic (NaOH), Anti scalant & Antifoam to the feed if required for process aspects. The Crystallizer shall generate crystal form of mixed salt, which shall be further processed through Pusher type salt centrifuge for disposal & dewatering.	There are many other types of ZLD systems such as ATFD, MEE, MED etc. meeting the treated water quality specified in tender. Kindly accept other ZLD technologies also as there is limited vendors for proposed technology which will restrict competition.	Bid specification prevails

182	Vol.I, Part-III Sheet 25 /124 pg 48 of 402	Combined RO recovery from all the stages of RO shall be minimum 95%.	95% recovery is very stringent for effluent treatment plant. We request the combined recovery from all stage of RO may kindly be modified as minimum 90%.	Overall RO system recovery shall be greater than or equal to 92%.
183	Vol.I, Part-III Cl. No. 3.1.2 Sh 2 of 3 pg 22 of 402	Terminal points & exclusions 2.0 Electrical Two nos. of 630A spare feeders in 6.6kv switchgear, one transformer feeder and one motor feeder in section A & B will be provided to the bidder for his further establishing the required switchgear for ZLD system.	1No of 630 A (Trf feeder) will be used for 6.6/0.433 KV Transformer to feede 415 V loads, 1No of 630 A (Motor feeder) will be used for 6.6 KV Motor for process pump. No redundant incomer is envisaged for LTMCC(415 V board). Kindly confirm. In this case, we are not envisaging 6.6 KV switchgear.	If a 6.6kV motor is envisaged in the scope. 1 HT switchgear shall be provided for the ZLD and all loads shall be fed from this switchgear to ensure redundancy.
184	Vol.I, Part-III Cl. No. 3.1.2 Sh 2 of 3 pg 22 of 402	Terminal points & exclusions 2.0 Electrical Two nos. of 630A spare feeders in 6.6kv switchgear, one transformer feeder and one motor feeder in section A & B will be provided to the bidder for his further establishing the required switchgear for ZLD system.	Kindly provide the details of 6.6 KV switchgear incomer of Exisiting board.	Refer enclosure of SLD.
185	Vol1, Part III, Technical specifications, 1.1.2	80 m3/hr.is pumped without treatment to CW make up tank (Bypass line). 150 m3/hr. blended waste water is pumped to a High Rate Solid Contact Clarifier	Can you clarify that where exact location of CW make-up water tank in the layout drawings and co-ordinates? What is the retention time or effective volume of CW water make-up water tank?	CW make-up water tank shall be located adjacent to UF-RO building. The capacity of the tank shall be 100m3.
186	Vol1, Part III, Technical specifications, 1.1.2, High recovery Reverse Osmosis	The UF effluent water from UF permeate tank is then pumped to RO units	What is the retention time or effective volume of UF feed tank or Clarified water storage tank, RO feed tank, RO-1 reject tank, Crystallizer feed tank and other intermediate storage tank except RO-2 reject tank or ZLD feed tank and Backwash water collection tank?	Retention time shall be 30min for all tanks except for final RO reject tank which is 500m3 capacity.
187	Vol1, Part III, Technical specifications,2. Brief scope of wok	xxiii) Statutory Clearances required for the successful establishment and operation of the ZLD Plant, if any.	All the statutory clearances required for the successful establishment and operation of the ZLD Plant by KPCL, please clarify.	Refer reply under sl. No. 17.
188	Vol1, Part III, Technical specifications,2. Brief scope of	xxiv) Facilities to hook up the required data of the ZLD system / water parameters to the pollution control boards or	Hook up details to PCB, can you please specify what type hookup and monitoring system?	Data from analyzers shall be uploaded to SPCB/CPCB through Data Aquasition System DAS/Server.
189	Vol1, Part III, Technical specifications, tertiary treatment	xxiv) pH correction system for CW make up water.	Can we get CW make-up water parameters to decide the pH requirements and other details?	Refer vol-I part-III, clause No. 4.2.5, Technical specification, pg 58 of 402.
190	Vol1, Part III, Technical specifications,4. PSF and filter feed pump, page 31 of 402	Pressure drop across the filter is 0.5 Kg/cm2	This value(s) is contradicting as per this specification of volume 1, technical specification, is stated that 0.8 Kg/m2, however, this shall be decided by bidder, please clarify.	Shall be decided by the bidder.
191	Vol1, Part III, Technical specifications,5. UF feed pump and UF feed tank, page 32 of 402	Requirement of UF feed tank shall be decided by bidder.	Noted, However, Submerged UF option, requirement of PSF or MGF filtration system and UF feed tank shall be decided by bidder, In case of SUF option, HRSCC overflow water is directly fed to SUF, so that, PSF and UF feed are not required, please clarify	Noted.
192	Vol1, Part III, Technical specifications,6. Filtration system,	Type of UF system shall be Pressurized or Sub merged one with membrane MOC of PVDF. Minimum 90% recovery shall	In case of SUF option, UF feed tank, feed pumps, PSF, Blower and Backwash pump are not required,	Noted. However, membrane MOC, recovery, flux rate and warranty clauses shall be as per bid specification.

193	Vol1, Part III, Technical specifications, pressurized UF, page 33 of 402	The hollow fiber shall be of PVDF (Polyvinylidene Fluoride) material, having 0.02 Micron Nominal pore diameter and shall be of reinforced type, and the fibers shall be fixed at both the ends. The flow path configuration shall be outside-in with air scouring facility during the backwash	In case of SUF option, micron rate is 0.04 micron, PVDF, reinforced type, out to in flow path. Please clarify.	Bidder shall decide the pore diameter as per membrane manufacturer standards during detailed engineering. However, recovery and warranty clauses of specified in the bid documents shall be adhered to.
194	Vol1, Part III, Technical specifications, UF CIP system, page 45 of 402	UF- Micron filter for CIP	In case of SUF option, CIP system for SUF not required, and selection of equipment's for SUF by bidder, however, the selection of equipment meets the objective of the tender specifications, please clarify	Noted.

ADDITIONAL POINTS

195	VOLUME-I, PART-I-GCC, SECTION: A1, SCOPE OF ENQUIRY Clause No. 2.0 Pg 3 of 158	TDS of ≤ 800 ppm by transferring it via CW makeup transfer pump to CW fore bay.		This shall be read as "TDS of ≤ 830 ppm by transferring it via CW makeup transfer pump to CW fore bay".
196	VOLUME-I, PART-II-SCC, SECTION: C13, Clause no. 1.05.03, pg 84 of 88.	3) TDS ppm < 800 6) Chloride ppm < 60		This shall be read as: 3) TDS ppm < 830 6) Chloride ppm < 75
197	VOL-I,Part-III, Technical specification, clause No. 1.1.1 Process Description, pg 11 of 402	This treated water of around TDS of ≤ 800 ppm is further pumped to CW fore bay.		This shall be read as "This treated water of around TDS of ≤ 830 ppm is further pumped to CW fore bay".
198	VOL-I,Part-III, Technical specification, Clause no. 4.2.5 , pg No. 58 of 402.	3) TDS ppm < 800 6) Chloride ppm < 60		This shall be read as: 3) TDS ppm < 830 6) Chloride ppm < 75
199	VOL-I,Part-III, Technical specification, Electrical system Clause no.5.0 , pg No. 148 of 402.	Two nos. of 630A spare feeders in 6.6kv switchgear, one transformer feeder and one motor feeder in section A &B will be provided to the bidder for his further establishing the required switchgear for ZLD system. All necessary modification like upgradation of breakers, down comers, relays & related protection components wiring etc to suit the ZLD system are in bidder scope.		This shall be read as "Two nos. of 630A spare feeders in 6.6kv switchgear, one transformer feeder and one motor feeder in section A &B will be provided to the bidder for his further establishing the required switchgear for ZLD system. Supply of two number 630A vacuum circuit breakers, down comers, CTs etc. are in bidder scope. All necessary modification like upgradation of breakers, down comers, relays & related protection components wiring etc to suit the ZLD system are in bidder scope".
200	General conditions of Contract pg 56 of 158.	1.1.23 "CONTRACT PERIOD" shall mean period of Twenty four (24) calendar months commencing from date of issue of Letter of Award comprising Twelve (12) calendar months of completion period or to the extent of valid extension permitted by the OWNER and 12 calendar months of Guarantee Period thereafter during which the 'CONTRACT' shall be executed as agreed between OWNER and BIDDER.		This shall be read as 1.1.23 "CONTRACT PERIOD" shall mean period of Twenty Six (26) calendar months commencing from date of issue of Letter of Award comprising Fourteen (14) calendar months of completion period or to the extent of valid extension permitted by the OWNER and 12 calendar months of Guarantee Period thereafter during which the 'CONTRACT' shall be executed as agreed between OWNER and BIDDER.

201	The revised scope of work			The Brief scope of work is revised as follows “Design, engineering, manufacture, Quality Surveillance, inspection & testing at supplier’s works, packing & forwarding, transportation, supply, delivery F.O.R. YCCPP site, unloading, receipt & storage, handling at site, erection, trial operation, testing, commissioning, conducting performance guarantee tests including painting and handing over of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, integrating ZLD scheme with main power plant including insurance towards transit risk / storage / intra-site transportation and erection including O&M of Plant and Equipment for a period of Five years for 1 x 370MW of Yelahanka Combined Cycle Power Plant of KPCL, Yelahanka, Bengaluru- 560064, in the State of Karnataka, India.
202	Contract performance guarantee Sec-A2, vol-I, Part-I, GCC, Clause No. 18.2			The performance guarantee(Security deposit) will be returned to the contractor on successful performance of main contract i.e after successful completion of O&M period. However, after expiry of guarantee period, the contractor will be given an option to enter into a fresh agreement towards O&M contract and submit SD @10% of the O&M contract value and take back the BG furnished towards main contract.
203	Technical specification			Sludge consistency at the outlet of the Centrifuge/filter press of HRSCC sludge handling system shall be max. 70% water and min. 30% solid.
204	List of Essential spares, Vol-II			Deleted
205	Operation and Maintenance Price Break-up-F15			Added, refer enclosure
206	Schedule of Guaranteed Chemical Consumption-F14.			Added, refer enclosure
207	List of Crystallizer Equipment			Revised, refer enclosure
208	Performance guarantee and Liquidated damages for performance.			Revised, refer enclosure
209	Annexure-7- Criteria for Evaluation and comparison of Bids.			Revised, refer enclosure
210	Annexure-9, Form of Bid			Revised, refer enclosure
211	Annexure-10, Declaration-I & Declaration-II			Revised, refer enclosure
212	Pre-Qualification criteria			Revised, refer enclosure

ENCLOSURE TO PRE-BID QUERIES REPLY

1	Revised Annexure-7- Criteria for Evaluation and comparison of Bids.
2	Revised Annexure-9, Form of Bid
3	Revised Annexure-10, Declaration-I & Declaration-II
4	Revised Payment Schedule
5	Revised List of Statutory clearances
6	Sec-A5- Revised Pre-Qualification criteria
7	Revised Performance guarantee and Liquidated damages for performance.
8	Revised Section C13-Operation and Maintenance of ZLD system
9	List of Crystallizer Equipment
10	Revised Schedule of Prices- F1
11	Revised Schedule of Milestones - F2.
12	Revised Schedule of Guaranteed Parameters-F3.
13	Revised Schedule of Guaranteed Power Consumption-F4.
14	Schedule of Guaranteed Chemical Consumption-F14.
15	Operation and Maintenance Price Break-up-F15
16	Tentative pipe routing to ZLD location
17	SLD of 6.6kV unit Switch Board #1CA, Metering & Protection
18	Vendor list of Electrical & I&C.
19	Contour Drawing

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: A2
		VOLUME-I PART-I-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	INSTRUCTIONS TO BIDDERS ANNEXURES	Sheet 1 of 2

REVISED ANNEXURE – 7
CRITERIA FOR EVALUATION AND COMPARISON OF BIDS:

1.0 The bidders proposal will be evaluated as per the following:

BID EVALUATION

The bidder shall comply with the Zero Liquid Discharge system and equipment parameters and specifications of equipment specified in the specification. No credit will be given during bid evaluation if parameters better than those specified are offered by bidder.

1.1 Price evaluation will be based on the fixed price, Power loading at duty point and cost for guaranteed chemical consumption.

The price for evaluation shall be

- a. the total lump sum FIRM price offered by the bidder for the entire scope of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, including GST and any other taxes, freight and insurance (F.O.R. Destination including all taxes and duties) and O&M for Five year period (as per schedule of prices – schedule- F1 volume III)

and

- b. Loading for Power input at duty point. For bid evaluation of power consumption only the total power input at duty point for all continuously working pumps/equipment indicated in the schedule of Motor / Guaranteed power consumption (Schedule –F-4) (Intermittent operating equipments shall not be considered) will be considered. The lowest quoted Guaranteed power consumption will form the base value for evaluation. An amount of **Rs. 3,96,719/-** for each kW differential in the quoted total Guaranteed power consumption at the duty point will be loaded for **bid evaluation**.

Bidder shall indicate the minimum guaranteed overall pump efficiency and motor efficiency which shall not be subject to any tolerance and the guaranteed power input to motor corresponding to their efficiencies, shall be indicated.

and

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: A2
		VOLUME-I PART-I-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	INSTRUCTIONS TO BIDDERS ANNEXURES	Sheet 2 of 2

- c. Loading for chemical consumption. For bid evaluation the cost of chemical consumption (The sum of the individually calculated cost of each type of chemicals indicated in the schedule F14 (Guaranteed chemical consumption)) for a period of 25 years shall be considered for loading.

The Total Quoted Price of the Bidder will be the offered price including applicable loading for power and chemical consumption indicated at a, b, c above. This shall be called as the **Total Quoted Price** of the Bidder. The lowest of the “**Total Quoted Price**” among the bidders shall be considered as the Lowest offer (L1).

2.0 Penalty Factor

- a) At the time of Performance Guarantee tests, for each kW differential in the actual motor input over the guaranteed motor input at duty point indicated by the bidder in the schedule of performance guarantee (without any further tolerance), penalty will be levied at **Rs. 7,93,439/-** per kW differential over and above the total guaranteed power consumed by all working pumps/equipment as indicated in the schedule of Motor / Guaranteed power consumption (Ref Section-F4). Power consumption by individual pump / equipment will not be compared for this purpose. For penalty purpose, the total power input measured for all working equipments (Sum of all the individually measured values) considered for differential power loading during bid evaluation and measured during the performance guarantee test conducted at YCCPP site, before handing over the system to KPCL will be considered.

Note: The bidder should furnish filled up schedule of Motors / guaranteed power consumption vide Section-F4 without fail. Bid documents without this schedule filled up is liable for rejection.

- b) For penalty purpose, the Chemical consumption actually measured individually over the guaranteed chemical consumption (as per the Schedule F14 of Guaranteed Chemical consumption) during PG test conducted at YCCPP site, before handing over of the system to KPCL will be considered. Penalty will be levied at double the rate per Liters/Kg/Nos differential over and above the guaranteed Chemical consumption calculated for 25 years.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: A2
		VOLUME-I PART-I-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	INSTRUCTIONS TO BIDDERS ANNEXURES	Sheet 1 of 4

ANNEXURE – 9
REVISED FORM OF BID
(To be furnished along with the Bid)

To,
The Chief Engineer (Thermal Designs),
Karnataka Power Corporation Limited.,
No. 22/23, Sudarshan Complex, Second Floor,
Sheshadri Road, BENGALURU - 560 009.

Sir,

We hereby bid for the Zero Liquid Discharge plant for YCCPP-1X370MW in the Schedule subject to the under mentioned conditions of Contract:

1. This bid will holds good for a period of 180 days from the date fixed for opening of Cover-1 of bids.
2. "Design, engineering, manufacture, Quality Surveillance, inspection & testing at supplier's works, packing & forwarding, transportation, supply, delivery F.O.R. YCCPP site, unloading, receipt & storage, handling at site, erection, trial operation, testing, commissioning, conducting performance guarantee tests including painting and handing over of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, integrating ZLD scheme with main power plant including insurance towards transit risk / storage / intra-site transportation and erection including O&M of Plant and Equipment for a period of Five years for 1 x 370MW of Yelahanka Combined Cycle Power Plant of KPCL, Yelahanka, Bengaluru- 560064, in the State of Karnataka, India.
3. We note that withdrawal from this tender within the period referred to in Clause (1) above or failure to provide services offered in the bid, which is accepted by the Chief Engineer (Thermal Designs), KARNATAKA POWER CORPORATION Ltd., after the order is placed will entail the forfeiture of Bank Guarantees and shall also be debarred either permanently or for a fixed period at the discretion of purchaser from participating in any of the purchaser's tenders.
4. Further, we also note that the Chief Engineer (Thermal Designs) KARNATAKA POWER CORPORATION Ltd., does not bind himself to accept the lowest or any bid and reserves the right to consider/reject any or all the bids.

We hereby agree to all the terms and conditions of the bid except those which are specifically commented upon by us. We also note that Chief Engineer (Thermal Designs) reserves the right to place orders for a portion of the items and/or quantities.

Bidders faithfully,

Station:

Dated :

Signature : _____
Full address : _____
With seal : _____

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: A2
		VOLUME-I PART-I-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	INSTRUCTIONS TO BIDDERS ANNEXURES	Sheet 2 of 4

ANNEXURE – 10

REVISED DECLARATION-I

- Name of work:** “Design, engineering, manufacture, Quality Surveillance, inspection & testing at supplier’s works, packing & forwarding, transportation, supply, delivery F.O.R. YCCPP site, unloading, receipt & storage, handling at site, erection, trial operation, testing, commissioning, conducting performance guarantee tests including painting and handing over of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, integrating ZLD scheme with main power plant including insurance towards transit risk / storage / intra-site transportation and erection including O&M of Plant and Equipment for a period of Five years for 1 x 370MW of Yelahanka Combined Cycle Power Plant of KPCL, Yelahanka, Bengaluru- 560064, in the State of Karnataka, India.

I / We have studied the site conditions and read the Bid documents and related matters carefully and diligently and that I/We have submitted the Bid having studied understood and accepted the full implications of the Bid document. The requirements of the BID documents as stated above will be fulfilled by me/us to the satisfaction of the Corporation.

I / We hereby declare that the bid submitted by me / us has no conditions contravening the commercial conditions of the bid.

Name of the BIDDER

Signature with seal

Date:

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: A2
		VOLUME-I PART-I-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	INSTRUCTIONS TO BIDDERS ANNEXURES	Sheet 3 of 4

ANNEXURE - 10

REVISED DECLARATION - II

Memorandum

I/We hereby tender for execution for the KARNATAKA POWER CORPORATION LIMITED, (herein before and herein after referred to as the Corporation) of the work specified in the under mentioned memorandum within the time specified in such memorandum at the rates quoted for each item specified in the Price Bid (memorandum showing the items of work to be carried out) and in accordance in all respects with specifications in writing.

a)	Name of work	“Design, engineering, manufacture, Quality Surveillance, inspection & testing at supplier’s works, packing & forwarding, transportation, supply, delivery F.O.R. YCCPP site, unloading, receipt & storage, handling at site, erection, trial operation, testing, commissioning, conducting performance guarantee tests including painting and handing over of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, integrating ZLD scheme with main power plant including insurance towards transit risk / storage / intra-site transportation and erection including O&M of Plant and Equipment for a period of Five years for 1 x 370MW of Yelahanka Combined Cycle Power Plant of KPCL, Yelahanka, Bengaluru- 560064, in the State of Karnataka, India.
b)	Earnest deposit money	Rs. 70,00,000/- (Seventy lakhs Rupees only)
c)	Contract performance Guarantee	The Successful bidder shall furnish a Contract performance guarantee (CPG) equivalent to 10% (Ten percent) of the contract amount in the form of BG from any scheduled or nationalized bank acceptable to the Corporation in the prescribed format before entering into agreement. In case of consortium, consortium partner shall submit additional SD equivalent to 1% (One percent) of the total contract value directly to KPCL in addition to the SD to be submitted by the lead bidder for the total contract value in the form of BG from any scheduled or nationalized bank acceptable to the Corporation in the prescribed format before entering into agreement.
d)	Completion period	14(Fourteen) months—including monsoon period for design, engineering, manufacture, testing, supply FOR site, erection, testing/trail run and conducting PG test of complete Zero Liquid Discharge Plant & accessories from date of LOA.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: A2
		VOLUME-I PART-I-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	INSTRUCTIONS TO BIDDERS ANNEXURES	Sheet 4 of 4

Should this tender be accepted I/We agree to abide by and fulfill all the terms and provisions of the conditions of the contract annexed hereto and all the terms and provisions contained in the Notice inviting tenders so far as applicable and in default thereof to forfeit and pay to Corporation, the sum of money mentioned in the said conditions.

A sum of **Rs. 70,00,000/-** (Seventy lakhs Rupees only) is paid as Earnest money deposit.

I/We agree that should I/We fail to execute the agreement or to commence the work specified in the above memorandum, Earnest Money shall be forfeited to the Corporation.

I/We hereby distinctly and expressly declare and acknowledge that before the submission of this tender, I/We have carefully followed the instructions, read the relevant Indian Standard Specifications, and I/We have made examination of the contract documents and plans, specifications and quantities and of the locations where such work is to be done and have made myself/ourselves aware of the scope and specifications of the work to be done and availability of the quantities of materials required.

I/We distinctly agree that I/We would hereafter make no claim or demand upon the Corporation based upon or arising out of any alleged misunderstanding or misconceptions or mistake on my/our part of the said covenants, agreements, stipulations, restrictions and conditions.

Any notice required to be served on me/us shall be delivered to me/us personally or forwarded to me/us by post (registered or ordinary) or left on my/our address given in the tender.

I/We fully understand the terms and conditions of the contract to be entered into between me/us and the Corporation and the written contract shall be foundation of the rights of the both the parties.

Name of the BIDDER

Signature with seal

Date:

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION-A4
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOL-I, PART-I- GCC
	GENERAL CONDITIONS OF CONTRACT	Sheet 1 of 2

13.3 Revised Payment schedule:

The terms of payment shall be as follows:

13.3.1 For Supplies from Contractor / Sub-vendor

- i. **10%** of total contract price for supply (excluding GST & Duties/levies/cesses) with interest of SBI -1 year MCLR + 6.15% per year as initial advance (if required by the bidder) along with Letter of Award (LOA) against the Bank Guarantee of the same value and Performance Bank Guarantee of 10% of contract value The bank guarantee furnished towards advance will be released only after complete advance and interest are adjusted / recovered.
- ii. **55%** (65% if advance not taken) of contract price for supply (including GST & Duties/levies/cesses) on pro-rata basis progressively against joint inspection report at site. The interest will be recovered at SBI 1 year MCLR + 6.15% per year on 10% of invoice value (advance paid) from each bill till complete advance is adjusted.
- iii. **25%** of contract price (including GST & Duties/levies/cesses) for supply will be released after completion of supply for each mile stone activity.
- iv. **10%** of contract price (including GST & Duties/levies/cesses) for supply on completion of PG test of the plant.

13.3.2 Erection:

- i. **10%** of total contract price for Erection (including GST & Duties/levies/cesses) with interest of SBI 1 year MCLR + 6.15% per year per year as initial advance (if required by the bidder) along with Letter of Award (LOA) against the Bank Guarantee of the same value and Performance Bank Guarantee of 10% of contract value. The bank guarantee furnished towards advance will be released only after complete advance and interest are adjusted / recovered.
- ii. **55%** (65% if advance not taken) of contract price for Erection (including GST & Duties/levies/cesses) on pro-rata basis progressively against joint inspection report at site. The interest will be recovered @ SBI 1 year MCLR + 6.15% per year on 10% of invoice value (advance paid) from each bill till complete advance is adjusted.
- iii. **25%** of contract price for Erection (including GST & Duties/levies/cesses) will be released after completion of Erection of each mile stone activity.
- iv. **10%** of contract price for Erection (including GST & Duties/levies/cesses) on completion of PG test of the plant.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION-A4
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOL-I, PART-I- GCC
	GENERAL CONDITIONS OF CONTRACT	Sheet 2 of 2

13.3.3 Freight:

- i. **10%** of total contract price for Freight portion (including GST & Duties/levies/cesses) with interest of SBI 1year MCLR + 6.15% (or prevailing rate of KPCL) per year as initial advance (if required by the bidder) along with Letter of Award (LOA) against the Bank Guarantee for an equivalent amount and Performance Bank Guarantee of 10% of contract value. The bank guarantee furnished towards advance will be released only after complete advance and interest are adjusted / recovered.
- ii. **55%** (65% if advance not taken) of contract price for Freight portion (including GST & Duties/levies/cesses) on pro-rata basis progressively against joint inspection report at site. The interest will be recovered @ SBI 1year MCLR + 6.15% (or prevailing rate of KPCL) per year on 10% of invoice value (advance paid) from each bill till complete advance is adjusted.
- iii. **25%** of contract price (including GST & Duties/levies/cesses) for Freight will be released after completion of supply of each mile stone activity.
- iv. **10%** of contract price for Freight portion (including GST & Duties/levies/cesses) on completion of PG test of the plant.

13.3.4 Civil Works:

- i. **10%** of total contract price for civil works (including GST & Duties/levies/cesses) with interest of SBI 1 year MCLR + 6.15% per year as initial advance (if required by the bidder) along with Letter of Award (LOA) against the Bank Guarantee of the same value and Performance Bank Guarantee of 10% of contract value. The bank guarantee furnished towards advance will be released only after complete advance and interest are adjusted / recovered.
- ii. **55%** (65% if advance not taken) of contract price for civil works (including GST & Duties/levies/cesses) on pro-rata basis progressively against joint inspection report at site. The interest will be recovered @ SBI 1 year MCLR + 6.15% per year on 10% of invoice value (advance paid) from each bill till complete advance is adjusted.
- iii. **25%** of contract price for civil works (including GST & Duties/levies/cesses) will be released after completion of Civil works of each mile stone activity.
- iv. **10%** of contract price for civil works (including GST & Duties/levies/cesses) on completion of PG test of the plant.

13.3.5 Deleted

13.3.6 Payment for Start-up & commissioning spares

- i. No separate payment will be made for Start-up & commissioning spares.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION-A4
		VOLUME-1 PART-1-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	GENERAL CONDITIONS OF CONTRACT	Sheet 1 of 2

REVISED LIST OF STATUTORY CLEARANCES

SL. NO.	CLEARANCES	AUTHORITY	RESPONSIBILITY
	<u>STATUTORY CLEARANCES/ APPROVALS (whichever is applicable)</u>		
1.	Approval as per Explosives Act and Rules	Chief Controller of Explosives	Contractor
2.	Approval as per Indian Boiler Regulation	Chief Inspectorate of Boilers	Contractor
3.	Approval as per Indian Electricity Act and Rules for Electrical Installation	Electrical Inspectorate	Contractor
4.	Approval as per Indian Petroleum Act and Petroleum Rules for storage and transport of Petroleum Products	Chief Controller of Explosives	Contractor
5.	Approval as per gas cylinder rules and handling and transport of compressed gases	Chief Controller of Explosives	Contractor
6.	Approval of weigh bridge and weigh scales	Inspector of Weights and Measure	Contractor
7.	a) Collection, storage and disposal of waste	KSPCB	Contractor
8.	b) Site clearances, safe report and safety audit		
9.	Approval of Fire Protection Scheme	(a) Fire Brigade (b) Tariff Advisory Committee	Contractor
10.	Approval of Chief Inspector of Factories of the proposed design and construction of power station and fuel facility	Chief Inspector of Factories of Government of Karnataka	Contractor
11.	Allocation / approval of electric supply for construction power and Contractor's township in colony area	KPTCL	Contractor
12.	Approval of building proposals and layout	Municipal Corporation : Executive Engineer, Building Proposal or concerned authorities	Contractor

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION-A4
		VOLUME-1 PART-1-GCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	GENERAL CONDITIONS OF CONTRACT	Sheet 2 of 2

13.	No Objection Certificate for sewage water treatment and associated plumbing	Municipal Corporation : Executive Engineer, Sewerage and Planning or concern authorities	Contractor
14.	No objection certificate for plant layout with regard to electrical equipment, operational safety	Chief Electrical Inspectorate of Karnataka	Contractor
15.	Consent of the Controller of Explosives to the possession and use of explosives for the purpose of blasting	Home Department of Government of Karnataka	Contractor
16.	Consent under the Factories Act, 1948 relating to firefighting capacities	Inspectorate of Factories	Contractor
17.	Clearance of Lifts	Inspector of Lifts	Contractor
18.	Approvals / clearances for labour / man power like License from labour commissioner for Construction labour, Registration of workers or exemption to be claimed if group insurance taken for some etc.	Concerned Authorities	Contractor
19.	All other clearances	Appropriate Authorities	Contractor

- Notes: 1. For the items which are Owner's responsibility, the Contractor shall furnish all technical / commercial inputs.
2. For the items which are Contractor's responsibilities, Owner shall furnish relevant certificates, as required. However, all costs including fees, miscellaneous expenses and coordination in securing the NOC / Permit / clearance are in the scope of Contractor.



**KARNATAKA POWER CORPORATION LIMITED
YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW)
ZERO LIQUID DISCHARGE PLANT (ZLD)**

SECTION: A5 VOLUME-I
PART- I - GCC

Additional Format to be submitted by Bidders –Revised “Pre Qualifying Criteria”

TYPE of Bid: STAND ALONE / CONSORTIUM

Sl. No	Type of Bidder	Name of the Bidder	QR Ref	Qualifying Experience	Work order Ref with page no in Offer for supporting documents	Completion certificate ref for the referred Work with page no in Offer for supporting documents	The relevant satisfactory performance certificates signed by CE/CEO of respective Thermal Power Station / other major industries / water supply board, on letter head with Corporate Identification Number, certifying the satisfactory performance / relevant Undertakings/ other relevant documents with page no in the offer.	Remarks
	Stand alone Bid (As per 2.0 of QR)		2.0	The intending bidder shall satisfy the following minimum qualifying requirements. The intending bidder should have a) Designed, engineered, manufactured / supplied, Constructed, Erected and Commissioned a waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr. and b) Designed, engineered, manufactured / supplied, erected and commissioned Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr.	ENCLOSED/ NOT ENCLOSED			

				The bidder should have executed the above works combined or individually in any Power Plant/ Industrial Projects/ Water supply Board/Municipal Corporation in preceding Ten years reckoned from the last date for submission of bids and the same shall be satisfactorily and demonstrably performed continuously for a minimum period of One year as on last date for submission of bids. As a proof of the above, the intending /Lead bidder and his consortium partner shall furnish the relevant satisfactory performance certificates, on letter head with Corporate Identification Number, signed by competent authority/CEO of respective Thermal Power Station / other major industries / water supply board etc. certifying the satisfactory performance of the equipment/ system supplied and installed by the bidder in respect of paras Sl.Nos.2 (a) and 2(b) above. The performance certificates mentioning continuous satisfactory performance shall be for a min of 1 Year within the latest period of 5 years only. (i.e. Should cover a minimum one year successful running period between 2014 to 2019).				
				Under takings to be furnished by the bidder. As per Annexure-4-Instruction to bidders	ENCLOSED/ NOT ENCLOSED			
				Scanned copy of BG towards EMD	ENCLOSED/ NOT ENCLOSED			
2	CONSORO-TIUM BID	(The number of partners in consortium including the lead bidder shall not be more than two)						
			2	The intending bidder shall satisfy the following minimum qualifying requirements. The intending bidder should have				
	Lead Bidder	M/s	2a	a) Designed, engineered, manufactured / supplied, Constructed, Erected and Commissioned a waste water pre-treatment plant with RO system of capacity not less than 75 Cum/hr.				

	Consort- ium Bidder	M/s	2b	b) Designed, engineered, manufactured / supplied, erected and commissioned Crystallizer cum Evaporator system & Salt Centrifuge with Mechanical vapour Recompression system (Zero Liquid Discharge plant) of capacity not less than 3 Cum/hr.				
				The bidder should have executed the above works combined or individually in any Power Plant/ Industrial Projects/ Water supply Board/Municipal Corporation in preceding Ten years reckoned from the last date for submission of bids and the same shall be satisfactorily and demonstrably performed continuously for a minimum period of One year as on last date for submission of bids. As a proof of the above, the intending /Lead bidder and his consortium partner shall furnish the relevant satisfactory performance certificates, on letter head with Corporate Identification Number, signed by competent authority/CEO of respective Thermal Power Station / other major industries / water supply board etc. certifying the satisfactory performance of the equipment/ system supplied and installed by the bidder in respect of paras Sl.Nos.2 (a) and 2(b) above. The performance certificates mentioning continuous satisfactory performance shall be for a min of 1 Year within the latest period of 5 years only. (i.e. Should cover a minimum one year successful running period between 2014 to 2019).				
			Undertaking to be furnished by lead/consortium bidder					
		M/s		Undertakings to be furnished by the lead/consortium bidder as per Annexure – 4 by each bidder	ENCLOSED/ NOT ENCLOSED			
				Scanned copy of BG towards EMD	ENCLOSED/ NOT ENCLOSED			
3	Financial Turnover:							
	Standalone Bidder	M/s		The bidder (as per para 2.1) in his name should have in the last five years period i.e. 2013-14 to 2017-18 achieved in at least two financial years a minimum financial turnover of Rs. 140.00 Crore . As a proof, the bidder shall furnish Copies of audited P&L Account	ENCLOSED/ NOT ENCLOSED			

				and audited balance sheet duly certified by the Chartered Accountant to establish annual turnover requirement stipulated above.			
	Lead Bidder	M/s		In case of consortium bid, Lead bidder and consortium partner (as per para 2.2.1 & 2.2.2) in their names should have in the last five years period i.e. 2013-14 to 2017-18 achieved in at least two financial years a minimum financial turnover of Rs.84.00 Crore and Rs. 56.00 Crore respectively. As a proof, the bidders shall furnish Copies of audited P&L Account and audited balance sheet duly certified by the Chartered Accountant to establish annual turnover requirement stipulated above.	ENCLOSED/ NOT ENCLOSED		
	Consortium Bidder	M/s			ENCLOSED/ NOT ENCLOSED		
4	Consortium agreement			Consortium agreement (as per KPCL format) between Lead bidder and consortium bidder/bidders.	ENCLOSED/ NOT ENCLOSED		

Bidder/ Lead Bidder/ Consortium bidders

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C5 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	PERFORMANCE GUARANTEES AND LIQUIDATED DAMAGES FOR PERFORMANCE	Sheet 1 of 2

REVISED PERFORMANCE GUARANTEES AND LIQUIDATED DAMAGES FOR PERFORMANCE:

1.1 General Requirements

- a) The contractor shall guarantee that the equipment offered shall meet the ratings and performance requirements stipulated for various equipment covered in these specifications.
- b) The guaranteed performance parameters furnished in the offer, shall be inclusive of all tolerance values including measurement uncertainties. No other tolerances shall be applicable for.
- c) The contractor shall demonstrate all the guarantees covered herein during performance guarantee /acceptance test as well as integrated operation of all equipment. The various tests which are to be carried out during performance guarantee/ acceptance test are listed in this Sub-section. The guarantee tests shall be conducted by the Contractor at site in presence of OWNER.
- d) All costs associated with the tests shall be included in the price.
- e) In case during tests it is found that the equipment / system has failed to meet the guarantees, the contractor shall carry out all necessary modifications and/or replacements to make the equipment/ system comply with the guaranteed requirements at no extra cost to the Employer within reasonable period agreed with the Purchaser. However, if the contractor is not able to demonstrate the guarantees, even after the above modifications/ replacements within a reasonable period allowed by the Purchaser after the tests have been completed, the Purchaser will have the right to either of the following:

Reject the equipment/system/Plant and recover the payments already made

OR

Accept the equipment/system/Plant after levying liquidated Damages as specified hereunder. The liquidated damages, for shortfall in performance indicated in Clause 1.2 for this sub-section. The liquidated damages shall be pro-rata for the fractional parts of the deficiencies.

1.2 GUARANTEES

The contractor shall guarantee the following:

- 1.2.1 Performance guarantees of Zero Liquid Discharge System as per the revised schedule of guaranteed parameters – F3
- 1.2.2 Guaranteed Power Consumption as per the revised schedule of guaranteed power consumption-F4.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C5
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOLUME-I PART-II-SCC
	PERFORMANCE GUARANTEES AND LIQUIDATED DAMAGES FOR PERFORMANCE	Sheet 2 of 2

1.2.3 Guaranteed Chemical Consumption as per the schedule of guaranteed Chemical consumption-F14.

1.2.4 Noise level shall be less than 85 db A, measured all around the pump and motor set at distance of 1m from the nearest surface of the pump and at a height of 1m from the floor level.

2. **Performance Liquidated Damages**

2.1.1 In the event that the equipments fail to meet the performance guarantees, Contractor will pay to owner Performance Liquidated Damages as indicated in the revised schedule of guaranteed parameters – F3.

2.1.2 **For increase in Guaranteed power consumption of the plant:** Penalty will be levied at **Rs. 7,93,439/-** per kW differential over and above the total guaranteed power consumed.

2.1.3 For increase in Chemical consumption of the plant: Penalty will be levied at double the rate per Liters/Kg/Nos differential over and above the guaranteed Chemical consumption calculated for 25 years.

Note:

- i. The guaranteed power consumption shall be calculated using the criteria specified in revised Schedule F4.
- ii. The guaranteed Chemical consumption shall be calculated using the criteria specified in Schedule F14.
- iii. Contractor's aggregate liability to pay liquidated damages for failure to attain the functional guarantee shall not exceed 10% of the Contract Price as per Clause No 19.2.2 of Section A-4, Vol -I Part-I- GCC.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	OPERATION & MAINTENANCE OF ZLD	Sheet 1 of 11

1.00 REVISED OPERATION & MAINTENANCE OF ZERO LIQUID DISCHARGE PLANT:

1.01 PERIOD OF OPERATION & MAINTENANCE

The successful tenderer shall be responsible for Operation & Maintenance of plant and equipment on 24x7 basis for a period of **Five years** after handing over / issue of Notice to Proceed (NTP) as the case may be. Spares, Speciality chemicals, Consumables are in the scope of bidder during O&M period. However, bulk chemicals shall be in KPCL scope.

After the successful performance of the contract and the completion of guarantee period the successful tenderer shall enter into an agreement for O&M contract and furnish Bank Guarantee from a Nationalized / Scheduled Bank towards O&M contract performance equivalent to 10% of the O&M contract value (including GST) for due and faithful performance of the O&M contract, valid for the entire period of the O&M contract and any extensions thereof.

1.02 SCOPE OF WORK

The successful tenderer shall be responsible for the Operation & Maintenance (O&M) for ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories and shall perform all necessary services in a prudent & efficient manner as listed below:

OPERATION:

1. Local operation of all equipments connected to zero liquid discharge plant (including auxiliary installations, lighting , dewatering pumps, power points etc.), instrumentation & automation systems (including calibration of instruments, measuring systems etc.) and other necessary services (make-up drinking water, Air conditioning and ventilation system, firefighting and other day to day safety) as required.
2. Running inspection of all equipments and related accessories, observation and recording of any abnormalities/defects during operation and maintaining logbook.
3. Monitoring the consumption of all utilities (power & make-up and drinking water) for optimum consumption and efficient operation.
4. Attend to consumer complaint immediately.
5. Co-ordination with KPCL for power etc.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOLUME-I PART-II-SCC
	OPERATION & MAINTENANCE OF ZLD	Sheet 2 of 11

6. Log sheet to be maintained for entering the technical / operating parameters of the system on hourly basis.
7. Log record is to be maintained for the activities carried out during the day and recording the defects noticed / complaints received from the owner. The successful tenderer should attend these complaints immediately and record the rectifications carried out in the same log book. On rectification of defects, the same has to be got inspected and certified by Site-In-charge (Successful tenderer) on a regular basis. All the records/documents are to be submitted to KPCL on daily basis for scrutiny and safe custody.
8. Clearance of minor faults, which arises during the shift, to ensure smooth operation of plant. Any major problem noticed in the shift to be intimated to the site-in-charge Successful tenderer) for mobilization of any extra support needed. Site-in-charge (successful tenderer) will ensure to clear the fault in same shift itself, or in the next shift to be decided after consultation with KPCL. In case of major problem, time frame shall be mutually discussed and agreed.
9. Any co-ordination required with KPCL for arranging shutdown for rectification of any major problem noticed in the shift. In addition to the above the successful tenderer shall submit the Standard Operating Practices (SOP) of all operational activities for waste water collection system, pre-treatment system, tertiary treatment system, dewatering system, ZLD plant and its equipments based on technological suppliers manuals / recommendation before commissioning of the plant and the same shall be evaluated by KPCL.

MAINTENANCE:

1. The scope covers maintenance of all static and rotary equipments used in ZLD Plant and miscellaneous equipments. The scope of successful tenderer is 100 % maintenance of the plant (inside plant battery limits) round the clock (three shifts in a day) including Sundays and all holidays as per the need.
2. The preventive maintenance plants including breakdown repair and maintenance shall be made by the successful tenderer for the entire contract period. Subsequently, monthly schedules shall be Prepared. Maintenance shall be combination of predictive, preventive and condition based.
3. Running maintenance activities like lubrication, oil top up, gland tightening etc.
4. Lubrication schedules indicating quantity of lubrication shall be prepared by the successful tenderer in consultation with KPCL and a fulfillment records shall be kept for further reference.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOLUME-I PART-II-SCC
	OPERATION & MAINTENANCE OF ZLD	
		Sheet 3 of 11

5. Periodical inspection of all the equipments of the plant shall be carried out as per the inspection plan, detailed equipment wise inspection check lists which will be jointly finalized by the successful tenderer and KPCL. All running inspections like daily, weekly, fortnightly, monthly etc. shall be included. The inspection reports are to be submitted daily to the engineer. All defects noticed during inspection are to be rectified immediately to prevent major outages. The check list will be reviewed jointly by the successful tenderer & KPCL and modified as per requirement to ensure the healthiness of the equipment.
6. Condition monitoring jobs to ensure the machines are running in perfect condition and to predict any problems shall have to be carried out by the successful tenderer.
7. The state of art condition monitoring equipments like vibration analyzers, bearing analyzers, shock pulse meters, acoustic based instruments shall be maintained and utilized to observe the health of the equipments, predict the trend, failures, analyze the problems of the equipments etc. The vibrations and temperature of the running equipments shall be maintained within the specified norms of the OEM and records maintained.
8. Maintenance work for all electrical equipment & system, Instrumentation & automation system of ZLD Plant on 24hrs. x 365 days basis. The complete maintenance activities include planning, co-ordination and execution of scheduled routine inspection, preventive, corrective and breakdown maintenance of all electrical equipments and systems including overhauling of HT & LT motors, instrumentation & control system, automation equipments and systems (routine / condition based) under the scope of work.
9. History records for all equipments to be maintained and handed over to KPCL. The records shall contain the information like alignment readings, bearing clearances, gear back lashes, details of assemblies/ subassembly replacements etc.
10. The health of the equipments after contract period shall be same as that of newly commissioned plant except the normal wear out that takes place during operation at the end of the contract period.

In-addition to the above successful tenderer shall submit the Standard Maintenance Practices (SMP) of all maintenance activities based on the equipment supplier's manuals / recommendations, his experience and other standard practices before commissioning of the plant and the same shall be evaluated by KPCL.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	OPERATION & MAINTENANCE OF ZLD	Sheet 5 of 11

REQUIREMENT OF MINIMUM QUALIFICATION FOR MAN POWER

Sl. No.	Position/ Post	Min. qualification	Min. experience
1.	Site in charge	Graduate Engineer (Mech/ Chem/ Civil)	5 years of experience in running treatment plant, pump house and Piping system. Out of which at least 02 years as site in charge. He must have at least 02 years of experience in running treatment plant, pump house and piping system.
2.	Supervisor (Operation)	Graduate/ Diploma Engineer	3 years of experience in running treatment plant, pump house and piping system.
3.	Supervisor (Maintenance-Mechanical)	Graduate/ Diploma Engineer	2 years of experience preferably in ZLD plant & treatment system
4.	Supervisor (Maintenance-Electrical/ Instrumentation)	Graduate/Diploma Engineer	2 years of experience preferably in electrical & Instrumentation field.
5.	Skilled technician	+2 /I.T. I.	2 years of experience in treatment plant, pump house and piping system.
6.	Skilled technician (Elect)	+2 /I.T. I.	2 years in electrical & Instrumentation field
7.	Unskilled helper	-	Around 1 year experience

1.04 LIQUIDATED DAMAGE FOR NON-COMPLIANCE OF GUARANTEED PARAMETERS.

1.04.01 QUALITY OF TREATED WATER

Schedule of guaranteed performance figures for quality

1.04.02 PENALTY FOR NON FULFILLMENT OF GUARANTEED VALUES

In case of non-fulfillment of the performance values LD will be levied on the Successful tenderer. Nonperformance in respect of equipment / system means that the equipment(s) considered individually as well as a system comprising all the equipments fail to meet the performance requirement as indicated in technical specification. That is, shortfall in the performance of individual equipment(s) shall be considered to be shortfall in the performance for the entire system, since it is a turnkey package. In case of non-fulfillment of

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	OPERATION & MAINTENANCE OF ZLD	Sheet 6 of 11

performance values the Successful tenderer will have to bear a Penalty to be levied for the various guarantee parameters shall be as follows:

1.04.03 LD for non-performance: If the contractor fails to achieve any one or more of the guaranteed values of the parameters indicated in Performance guarantee for 3 days in a month, KPCL will levy penalty at the rate of 1% of Annual contract value for the O&M subject to maximum of 5% of Annual contract value for O&M. If such deviation of parameters is observed for a period of continuously 3months, the O&M contract will be liable for termination.

1.04.04 LD for non-availability: The monthly system availability shall be minimum 95% during the O&M contract period. For every 1% drop in availability below 95% and upto 90% for the reasons attributable to the contractor, 1% of the Annual contract value for the O&M contract will be levied as a penalty subject to maximum of 5% of Annual contract value for O&M. If the availability factor is continuously < 90% for 3 months, then the O&M contract is liable for termination.

In case of the system availability is less than 90%, the Successful tenderer shall carry out repair/ replacement/ modification of particular equipment/ system at his own cost within a period of 15 days and thereafter, bringing the system availability to the minimum guaranteed level of 95%. The availability of the system shall then be observed for one month after the repair/ replacement/ modification are completed to decide whether or not the stipulated requirement is met during this period. The Successful tenderer in the event of failure to restore shall extend the validity of Contract Performance Bank Guarantee suitably at his own cost till the matter is decided. In case after all such repairs and replacement, the availability of the system is still less than 90%, then the O&M contract is liable for termination.

$$\text{Monthly Availability in \%} = \frac{((24 \times \text{No of days in a month}) - \text{Scheduled maintenance hours} - \text{breakdown hours})}{((24 \times \text{No of days in a month}) - \text{Scheduled maintenance hours})} \times 100$$

1.05 Cumulative Liquidate Damages per annum for non-fulfillment of Guarantee and non-availability of the system for the operation and maintenance period

Cumulative Liquidated Damages per annum for non-fulfillment of Guarantee values as mentioned in the relevant clauses of this technical specification are independent of each other and are applicable separately and concurrently subject to total maximum limit of 10% of the relevant annual contract value for operation and maintenance.

1.05.01 The owner may, without any prejudice to any other method of recovery, deduct the amount of such damages and LD from any amount payable, due, or which may become due, to the Successful tenderer under the contract. The payment of deductions of such damages

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	OPERATION & MAINTENANCE OF ZLD	Sheet 7 of 11

and penalties shall not relieve the successful tenderer of his obligations to complete the works or from any other of his obligations and liabilities under the contract.

1.05.02 In addition to the above, KPCL shall be free to cancel the contract or a portion thereof and get the balance works executed through other agency or agencies at the risk and cost of the successful tenderer. In the event such action is taken, the successful tenderer shall be liable to pay KPCL for any loss, which the owner may sustain but he will not be entitled to any gain of such action made against default. The manner and method of such contract shall be at the entire discretion of the KPCL whose decision shall be final and binding. This right shall be without breach/without prejudice to the other rights of KPCL to recover damages for breach of contract by the successful tenderer.

1.05.03 The penalty for not maintaining the guaranteed parameters for CW Make-up water shall be as follows:

The final blended water quality in CW make up tank (RO permeate water, Crystallizer distillate and bypass stream of water from CMB) shall be as detailed below:

SL. NO	DESCRIPTION	UNIT	VALUES	Rate of LD
1.	PH		7.0-7.5	If such deviation of parameters is observed frequently, Notice will be served. Further the O&M contract will be liable for termination
2.	TSS	ppm	5.0	
3.	TDS	ppm	< 830	
4.	HARDNESS as CaCO ₃ ,	ppm	< 220	
5.	Silica dissolved	ppm	< 24	
6.	Chloride	ppm	< 75	

1.05.04 AVAILABILITY OF PLANT

Breakdown

If the individual equipment fails to perform or breaks down the standby equipment will be put under operation. The overall system availability is not affected. The equipment shall be attended and restored within a reasonable time to be decided by KPCL. If because of breakdown of certain equipment the system availability is affected and runs at partial output or the complete system is out of operation. In such case if the system under partial breakdown then is to be restored back to in operation at rated capacity within 4 hrs. If there is complete breakdown of the system the same is to be restored back to 50% of rated output within 4 hrs and 100 % of rated output in total 8 hrs.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	OPERATION & MAINTENANCE OF ZLD	Sheet 8 of 11

1.05.05 MANPOWER DEPLOYMENT

The successful tenderer shall deploy manpower as per clause no. 1.03. However the successful tenderer shall ensure that such personnel are on duty at the plant at all times, twenty four (24) hours a day and seven (07) days a week commencing from the date of NTP. If the successful tenderer fails to adhere the man power deployment plan as per clause no.1.03, they shall be liable to pay the penalty as per details mentioned below.

Sl. No.	deployment Manpower	Penalty
1.	Site in-charge & Supervisor/ Shift-in-Charge	Rs (4 times the minimum wages of skilled labour prevailing during the time of contract in Karnataka x no. of days of non-deployment)
2.	Skilled technician	Rs (2 min. wages of skilled labour prevailing during the time of contract in Karnataka x no. of days of non-deployment)
3.	Other work force	Rs (2 min. wages of semi-skilled/ unskilled labour prevailing during the time of contract in Karnataka x no. of days of non-deployment)

1.06 SUPPLY OF SPARES & CONSUMABLES

1.06.01 Supply of all Spares, Speciality chemicals, Consumables required for Five years of operation and maintenance of ZLD Plant are in the scope of bidder. However, bulk chemicals shall be in KPCL scope.

1.07 TRAINING

Successful tenderer shall provide on-job training to KPCL personnel during this One year of operation and maintenance period.

1.08 HANDING OVER THE PLANT AFTER EXPIRY OF TERM

After the expiry of term & extension of term as the case may be, the Successful tenderer shall hand over the plant to KPCL with all guaranteed parameters as achieved during PG test. The Successful tenderer will organize a joint inspection with KPCL and original equipment manufacturers of all the major & critical equipments and a joint inspection report/defect list of the equipments will be prepared in accordance to the norms of manufacturer which will be decided during plant hand over. The Successful tenderer will eliminate all the defects (if any) before expiry of the contract. Otherwise KPCL may proceed to do the work at Successful tenderer risk and expense and deduct such extra expenditure

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		Sheet 9 of 11

from the bills/final bill such amount as may be decided by KPCL. While handing over the plant the Successful tenderer will hand over all technical documents, literature, instruction manual, tools & tackles and all the relevant record documents. All the aforesaid safeguards / rights provided for KPCL will not prejudice its other rights/remedies elsewhere provided herein and/or under law.

1.09 HANDING OVER CERTIFICATE

On completion of term, the Successful tenderer will apply to KPCL for the issue of handing over certificate and the same will be issued within 30 days of the handing over in all respects, after verifying from the documents and tests and satisfying himself that the operation and maintenance has been completed in accordance with details set out in the contract documents.

1.10 TERMS & CONDITIONS

- The objective of the proposed specification is to operate and maintain ZLD Plant along with all auxiliary services in such a way that, there will not be any interruption in the services intended.
- The Successful tenderer will observe all the safety procedures of the Power plant and rules, regulation of State of Karnataka.
- The ZLD plant will be operated and maintained round the clock including Sundays & Holidays. The Successful tenderer will deploy sufficient man power in A, B & C shifts as mentioned in Cl.1.03 to carry out operational and maintenance activities of ZLD Plant. The Successful tenderer will ensure that the plant is never kept un-manned.
- The Successful tenderer will deploy sufficient man power in 'G' shift to carry out maintenance activities of Mechanical, Electrical, and Instrumentation & Automation equipments. However, in case of exigency of work, maintenance activities will have to be carried out beyond 'G' shift hours also. The decision of KPCL is final in this regard.
- The Successful tenderer will deploy qualified and experienced persons in ZLD Plant as detailed in Cl. 1.03 above. Bio data along with proof of experience of site in charge, supervisors and all workmen will be submitted to KPCL for verification/approval. Only accepted persons will be deployed at site. The persons engaged for electrical jobs will be qualified and experienced electricians and have exposure in doing trouble shooting of instrumentation & control system.
- ZLD Plant and connected equipments will be operated strictly as per the instructions provided by the Original Equipment Manufacturer / as per standard operating procedures

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13 VOLUME-I PART-II-SCC
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		Sheet 10 of 11

duly approved by KPCL. Similarly, maintenance of equipments including routine preventive maintenance will be done in accordance with the relevant standard maintenance practices duly approved by KPCL.

- The equipments/units, where standby is available will be operated in a systematic pattern in rotation so as to ensure that all the equipments are available in working condition. If any unit breakdowns / fails to function, the standby unit will be put in operation. The failed equipment/unit will be treated as standby unit and maintenance jobs will be carried out and made available for operation within the allowable time as agreed with KPCL.
 - At the start and end of every shift the shift –in-charge will give status report to the representatives of KPCL. Any major breakdown, power failure etc., should be intimated immediately. The Site-in-charge will meet authorized representative of KPCL to finalize the schedule of jobs for carrying out the maintenance activities and to evaluate the performance of equipment.
 - The Successful tenderer will keep all related tools and tackles including the calibrated testing and measuring instruments required for attending all types of maintenance jobs and day to day works at his own cost. The successful tenderer will ensure calibration of all measuring instruments and to maintain calibration records as per KPCL requirement.
 - In the event of any breakdown, the Successful tenderer will continue the breakdown job without any delay till the equipment is brought in to operation. If necessary, Successful tenderer will arrange and deploy additional manpower to reduce the breakdown period. Also, if the services of any expert are required, the Successful tenderer will arrange the same in the most expeditious manner at his own cost. The Successful tenderer will ensure availability of the services of Original Equipment Manufacturer at his own cost. The Successful tenderer will submit failure analysis report related to the breakdown equipment and action plan for prevention of further breakdown to KPCL. The action plan will be implemented by Successful tenderer after due approval by KPCL.
 - The responsibility of the Successful tenderer is not limited to mere replacement of the spares. The Successful tenderer is also responsible for the testing & commissioning of the replaced parts along with satisfactory performance of the whole system.
 - The successful tenderer will maintain the following records /data books as per KPCL prescribed format.
- _ LOG BOOK: The Successful tenderer will maintain daily log record (job detail register/file) for the work done, spares/consumables used, any breakdown and the applicable penalties levied etc. will be recorded and the same will be got signed by Site in charge or his representatives at the end of the shift/day.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: C13
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOLUME-I PART-II-SCC
	OPERATION & MAINTENANCE OF ZLD	
		Sheet 11 of 11

- _ **EQUIPMENT DATA REGISTER:** The Successful tenderer will maintain all relevant information about each equipment and systems. Equipment data sheet will contain information like description of the equipment, supplier's name, reference of spares drawings, assembly drawings, maintenance manuals etc.
- _ **EQUIPMENT HISTORY BOOK:** The Successful tenderer will maintain equipment history record of each and every equipment and system. This is a record of all spares, overhauls, modifications, replacement done on equipment and spares used for these purposes.
- _ **BREAKDOWN REPORT BOOK:** The Successful tenderer will maintain breakdown report for keeping a record of breakdown, its analysis and recommendations.
- _ **ATTENDANCE REGISTER:** Shift wise attendance register for the personnel engaged is to be maintained and got it signed by the Site in charge or his representative at the end of the shift/day. The attendance sheet shall be furnished to KPCL.
- _ The reports / records prepared will be in soft form and will be sent to all concerned decided by Site in charge / his representatives. One hard copy will be submitted to Site in charge / his representatives.

The Successful tenderer will ensure the ZLD plant and connected equipments are always available and maintained at guaranteed parameters.

KPCL reserves the right to terminate the contract without assigning any reasons with a Notice period of two months.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	VOLUME-I
		PART-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	TECHNICAL SPECIFICATION	Sheet 1 of 2

ZERO LIQUID DISCHARGE PLANT

13. REVISED LIST OF CRYSTALLIZER EQUIPMENT

The list of equipments for zero liquid discharge plant shall be as below. Any other equipments / facilities not listed below but required for the completion for the ZLD plant is in the scope of the Tenderer. Quantities and list of equipments shall be finalized during detail engineering.

Stages indicated for evaporators / Crystallizer is tentative it may vary depending upon the functional requirement / OEM recommendation / which shall be decided after finalization of supplier and during detailed engineering stage.

EQUIPMENT ITEM	MATERIAL
Crystallizer Feed Tank	Coated Concrete
Crystallizer Feed Tank Mixer	Minimum MOC - Duplex SS 2205.
Crystallizer Feed Pump & Motor	Cd4MCuN
Crystallizer Feed Preheater Plates	Ti Gr.1 / 6% Moly/Ti. Gr.11
Crystallizer Vapour Body	Minimum MOC - SS 2507.
Mist Eliminators	Dup 2507/ 6% Moly
Crystallizer Heat Exchanger:	
Tubes	Ti-2/Ti-12 / Ti-16
Tube sheets	Ti-1/Ti-2/Ti-12/ Ti-16 clad 316L SS /C-276
Shell	316L SS
Crystallizer Recirculation Ducts	2507/ 6% Moly
Vapour Ducts	SS 316L
Vapour Duct Expansion Joints	SS 316L
Centrifuge	6% Moly / 2507
Centrate Tank Mixer	Minimum MOC - SS 2507.
Centrate Tank	Coated RCC
Centrate Pump	Cd4MCuN
Crystallizer Process Condensate Pump & Motor	316 SS
Crystallizer Condensate Tank	316L SS
Crystallizer Condensate transfer Pump	316SS
Crystallizer Recirculation Pump	Cd4MCuN / CK3McuN / Inconel 625

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	VOLUME-I
		PART-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	TECHNICAL SPECIFICATION	Sheet 2 of 2

Mechanical Vapour Compressor	Centrifugal Fan, 2205 Casing, 2507 Impeller with IGV Or Rotary lobe PD Blower with silencers, Cast iron with Ni-Resist lobes, 316L SS silencers
Surface Condenser	SS316L tubes, heads, shell
Deaerator	6% Moly
Dosing tanks	FRP
Sulfuric Acid Pump	A-20/PTFE
Hydrochloric Acid Pump	PP/PTFE/ H-alloy C
Antifoam Pump	PVC/PP
High Capacity Antifoam Pump	PVC/PP
Antiscalant Pump	PVC/PP
Caustic Pump	316 SS
Crystallizer dump tank / Boil out tank	Coated RCC
Crystallizer dump transfer pump	Duplex SS
<i>Note: 1.Mechanical Vapour compressor shall be provided with acoustic enclosure to restrict the noise level to 70 db at 1mt distance.</i> <i>2. Above list of equipment are tentative in nature. May subject to change as per the functional requirement, same shall be decided during detailed engineering.</i>	

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F1 VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	PRICE SCHEDULES	Sheet 1 of 3

REVISED SCHEDULE OF PRICES –F1

“Design, engineering, manufacture, Quality Surveillance, inspection & testing at supplier’s works, packing & forwarding, transportation, supply, delivery F.O.R YCCPP site,unloading, receipt & storage, handling at site, erection, trial operation, testing, commissioning, conducting performance guarantee tests including painting and handing over of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, integrating ZLD scheme with existing BHEL supplied main Power plant along with O&M of Plant and Equipment for a period of Five years including insurance towards transit risk / storage / intra-site transportation and erection for 1 x 370MW of Yelahanka Combined Cycle Power Plant of KPCL, Yelahanka, Bengaluru. 560064, in the State of Karnataka, India.

SL. NO	DESCRIPTION AS PER SPECIFICATION	PRICE IN Rs.
1.0	<u>LUMPSUM PRICE FOR SUPPLY :</u> Lump sum firm price for “Design, engineering, manufacture, Quality Surveillance, inspection & testing at supplier’s works, packing & forwarding, transportation, supply, delivery F.O.R YCCPP site, of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression, forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, integrating with existing BHEL supplied main power plant including insurance towards transit risk excluding Custom Duty / IGST / GST & any other taxes which are applicable for such contracts in the State of Karnataka as on the date of submission of price bid.	
1.1	Custom Duty on Imported Equipment’s (if applicable)	
1.2	IGST along with HSN code (if applicable)	
1.3	GST along with HSN code	
2.0	<u>LUMPSUM PRICE FOR ERECTION:</u> Lump sum and firm price for “ unloading, receipt & storage, handling at site, Erection, trial operation, testing, commissioning, conducting performance guarantee tests including painting and handing over of ZLD Plant comprising of waste water pre-treatment plant with RO system and Crystallizer system with Mechanical vapour Recompression forced circulation crystallizers and accessories with all civil, structural, mechanical, electrical, control & instrumentation works, & integrating ZLD scheme with existing BHEL supplied main power	

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F1 VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	PRICE SCHEDULES	Sheet 2 of 3

	plant including insurance towards storage / intra-site transportation and erection excluding GST & any other taxes which are applicable for such contracts in the State of Karnataka as on the date of submission of price bid and Cess (on erection part).	
2.1	GST along with SAC code.	
2.2	Marine cum erection insurance on lump sum and firm price basis including GST.	
3.0	<u>LUMP SUM PRICE FOR CIVIL WORKS:</u> Lumpsum firm price for Civil Works including, supplies such as cement, reinforcement steel, structural steel, all construction materials, all foundation bolts etc. required for subject work including Design, Engineering and Construction of entire Civil works excluding GST and any other taxes.	
3.1	GST along with SAC Code	
4.0	<u>LUMP SUM PRICE FOR FREIGHT:</u> Lumpsum firm price for Freight from Ex Manufacturer works / vendor works to F.O.R YCCPP site excluding GST and any other taxes.	
4.1	GST along with HSN Code	
5.0	<u>LUMP SUM PRICE FOR O&M:</u> Lumpsum firm price of O&M for a period of Five years from the date of takeover inclusive of spares, consumables and speciality chemicals.	
5.1	GST along with SAC Code	
	<u>LUMP SUM PRICE FOR Others, if any</u>	
	Total price	

- Note: The bidder has to submit Price allocation schedule matching the Sl No. 1 to 5 above indicating Custom Duty, IGST and GST for all applicable items and the rates considered for KPCL approval.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F1 VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	PRICE SCHEDULES	Sheet 3 of 3

A. The rates of GST any other taxes that is applicable for such contracts in the State of Karnataka as on date of the submission of the price bid and their percentage rates considered in the above Lump sum firm prices shall be clearly indicated.

a)	GST on own manufactured items	
	I)	%
	II)	%
	III)	%
b)	GST on bought out items	%
	i)	%
	II)	%
	III)	%
c)	GST on Exempted items.	
	I)	
	II)	
	III)	
d)	Custom duty on imported equipment.	%
e)	IGST for imported equipment.	%
f)	GST for Services	%
g)	Any other taxes/duties/levies considered.	%

B. GST or any other tax exemption benefit shall be passed on to KPCL.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY

DESIGNATION_____

DATE _____

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F2 VOLUME-III
		Sheet 1 of 3
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	

REVISED SCHEDULE OF MILESTONES-F2

Milestone activities are as listed herein below:

SL.No.	Milestone activities
1	Completion of Effluent transfer pump system [from CMB to flash mixer & RO permeate tank (By-pass line)]
2	Completion of HRSCC system.
3	Completion of UF System (from PSF to UF water collection tank).
4	Completion of RO System (from RO feed pumps to RO permeate Storage tank and RO reject collection Tank).
5	Completion of ZLD Auxiliary systems (like De-aerator, Condenser, Distillate tank, Plate heat exchangers, Drawal of steam from the main Power plant etc.)
6	Completion of Evaporator cum Crystallizer System (like RO reject transfer pumps, Mechanical Vapour Compressor, Crystallizer, Re-circulation pump and Pusher type salt centrifuge etc.)
7	Completion of Extension of services from main power Plant (like Power supply, Fire hydrant system & Fire detection & alarm system, Instrument air, Potable water from the main plant network, Integration of the ZLD plant with the Main Power plant etc.)
8	Completion of other Auxiliary Systems. (like Air Conditioning, Ventilation, Material handling system, Illumination, Inter connecting Roads and other auxiliary systems required for the successful implementation of ZLD plant etc.)
9	Completion of HRSCC sludge handling system (like Sludge Sump and Sludge handling system, Centrifuge etc.)
10	Successful Completion of Performance guarantee test (for entire Zero Liquid Discharge Plant.)
NOTE:	Broad billing break-up and Detailed billing break-up (BBU) for Supply, Erection and commissioning and Civil works under the various heads indicated against Sl. No. 1 to 9 shall be furnished for customer approval before raising the invoice for payment.

NOTE:

- a) **Completion period is 14 months including monsoon** for the entire scope of work as specified elsewhere from the date of issue of LOA.

Bidder shall complete the commissioning of 50% RO capacity system (75m³/hr.) within 8 months from the date of LOA and 100% RO capacity system within 10 months and complete entire scope of work within 14 months.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F2 VOLUME-III
Notification no : KPCL/2018-19/PS/WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 2 of 3

However, KPCL desires that the bidder has to complete 50% RO capacity system in 6 months and 100% RO capacity system in 8 months.

- b) In the event of delay beyond completion period on account of reasons not attributable to the contractor, KPCL will review the progress and the completion period may be considered for shifting to the extent of the delays that are not attributable to the contractor.
- c) The Liquidated damages payable by the Contractor to the Owner for delay in Supply and Erection including achieving Performance acceptance after the Completion Date of the Plant (14 months) shall be at the rate of **Half (0.5) percent of total contract value per week** or part thereof of delay.
- d) Incentive for the early completion:

If the bidder successfully completes the Commissioning of 50% RO capacity system in less than 8 months KPCL will give an incentive @ 5% of the contract value (Basic lumpsum price for supply, erection and civil works as per Schedule-F1) per month on prorata basis (calculated in days).

If the bidder successfully completes the Commissioning of 100% RO capacity system in less than 10 months KPCL will give an incentive @ 5% of the contract value (Basic lumpsum price for supply, erection and civil works as per Schedule-F1) per month on prorata basis (calculated in days).

e) Limitation of Liability

Under no circumstances that the Contractor's aggregate liability for:

- (a) Cumulative liquidated damages for delay
- and/or**
- (b) Cumulative Liquidated Damages for failure to achieve the Performance Guarantees shall not exceed **10%** of the Contract Price.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY

DESIGNATION _____

COMPANY _____

 KARNATAKA POWER CORPORATION LTD. (OFFICE OF CHIEF ENGINEER) (BANGALORE-560001)	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F2 VOLUME-III
Notification no : KPCL/2018- 19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 3 of 3

DATE _____

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F3 VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 1 of 1

REVISED SCHEDULE OF GUARANTEED PARAMETERS - F3

To be submitted along with Technical Bid (Cover-I)

The Bidder shall prove the performance guarantee in respect of the following. Any variation of values stated below during the performance test will be taken into account for acceptance/ rejection of equipments/systems.

Sl. No.	Parameters	Guaranteed Values	Acceptable limit with LD	Rate of LD
1	Overall RO system recovery	≥ 92%	91%	For <92 % upto 91% recovery:- 5 % LD For <91% recovery:- Plant will be Rejected.
2	RO permeate	TDS < 100 ppm	110	TDS > 100 < 105 ppm:- 1 % LD TDS > 105 < 110 ppm:- 2 % LD TDS > 110 ppm - Plant will be Rejected
3	Distillate Purity (Non-volatile TDS)	TDS < 100 ppm	No tolerance in treated water quality is acceptable.	TDS > 100ppm Plant will be Rejected
4	Moisture content (MC) in final product (Reject)	≤ 20% by weight	22%	For >20% upto 21% MC: – 1 % LD For >21 % upto 22% MC: – 2 % LD For >22% - Plant will be Rejected.

NOTE:

1. The bidder has to prove the guaranteed values for the ZLD plant comprising of waste water pre-treatment plant with RO system and Crystallizer system as indicated above, for KPCL to take over.
2. No credit/benefits will be given during bid evaluation, if parameters higher than those specified in Technical specification are offered by the bidder.
3. If, even with two repetitive tests, the performance values are not reached for reasons within the successful tenderer's responsibility, the successful tenderer shall undertake at his own cost such modification or replacement as are considered necessary to obtain the performance guarantee values and the responsibility to demonstrate performance guarantee shall continue to remain with the successful tenderer till so established.
4. Should the performance values fall below acceptable level, the unit/sub-unit/equipment shall be reject by the KPCL and the successful tenderer shall be

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F3
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOLUME-III
	SCHEDULES	Sheet 2 of 1

liable, to replace the unit/sub unit/equipment failing which KPCL reserves the right to get it done from alternative sources at the risk and cost of the bidder.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY

DESIGNATION _____

DATE _____

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F4
		VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 1 of 3

REVISED SCHEDULE OF GUARANTEED POWER CONSUMPTION – F4

To be submitted along with Technical Bid (Cover-I)

The Bidder shall indicate herein the guaranteed power consumption at duty point. Without this schedule duly filled-in, the bid is deemed to be incomplete and is liable to be rejected.

Sl. No.	Equipment	Quantity (Working + Standby)			Guaranteed motor input at duty point in KW(Working Equipment)	
		Total	Working	Standby	Per equipment	Total of working equipment
1	While guaranteeing the auxiliary power consumption the bidder shall necessarily include all continuously working pumps / equipment operating auxiliaries under this package (Intermittent operating equipments shall not be considered). Intermittent operation equipments excluded for Auxiliary power consumption such as HRSCC Sludge disposal system, UF backwash, PSF backwash, RO CIP, service water pumps, chemical dosing pumps, ventilation, Air conditioning, material handling, illumination etc.					
a						
b						
c						
d						
e						
.						
.						
.						
.						
2	Total Auxiliary power requirement					

 KARNATAKA POWER CORPORATION LTD OFFICE OF CHIEF ENGINEER (THERMAL REGION)	KARNATAKA POWER CORPORATION LIMITED	SECTION: F4
	YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 2 of 3

NOTE:

Bidder shall note that while guaranteeing the auxiliary power consumption the bidder shall necessarily include all continuously working pumps/equipment operating auxiliaries under this package (Intermittent operating equipments shall not be considered) and same shall be considered for loading purpose during tender evaluation and for levying of penalty during performance guarantee test in case of excess power consumption more than the guaranteed motor input at duty point as indicated by the bidder under column **“Guaranteed motor input at duty point in kW”** above. Power consumed by individual equipment will not be compared for this purpose.

Loading for Power input at duty point. For bid evaluation of power consumption only the total power input at duty point (as per the above table) for all continuously working pumps/equipment indicated in the schedule of Motor / Guaranteed power consumption (Schedule –F-4) (Intermittent operating equipments shall not be considered) will be considered. The lowest quoted Guaranteed power consumption will form the base value for evaluation. An amount of **Rs. 3,96,719/-** for each kW differential in the quoted total Guaranteed power consumption at the duty point will be loaded for **bid evaluation**.

For penalty purpose, the total auxiliary power requirement actually measured (as per the above table) during PG test conducted at YCCPP site, before handing over of the system to KPCL will be considered. Penalty will be levied at **Rs. 7,93,439/-** per kW differential over and above the total guaranteed power consumed.

Bidder has to furnish UF & RO projections certified by the Membrane manufacturer with their offer. Power consumption in their projections shall only be indicated by the bidder against power consumption at duty point and same shall be considered for bid evaluation purpose.

Membrane manufacturer’s projections from KPCL preferred makes (Dow, Hydranautics, Koch, GE, CSM, INGE/BASF, LG) for RO and UF membrane shall only be considered.

UF feed pump / RO high pressure pump power consumption shall be based on UF / RO projection calculation which in turn is based on feed water parameters specified tender specification.

Bidder has to supply the same membrane to KPCL after award of the contract for which projection certificate was furnished during bid evaluation.

Membrane projections and Total system shall be designed based on the TDS indicated in the Table-2. (CMB water analysis) and not based on ionic loads.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F4
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOLUME-III
	SCHEDULES	
		Sheet 3 of 3

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY

DESIGNATION _____

DATE _____

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F14 VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 1 of 3

SCHEDULE OF GUARANTEED CHEMICAL CONSUMPTION – F14

To be submitted along with Technical Bid (Cover-I)

The Bidder shall indicate herein the guaranteed Chemical consumption. Without this schedule duly filled-in, the bid is deemed to be incomplete and is liable to be rejected.

Sl. No.	System / Chemicals	Chemical Concentration	Unit	Price/ unit (Rs.)	Guaranteed Qty/ Day (24hrs. running)	Total Price (Rs.)	Remarks
	Pre-treatment						
1.	Hypo dosing (NaOCl) (if any)	10%	Kg	7			
2.	Coagulant (FeCl ₃)	40%	Kg	8.0			
3.	Polyelectrolyte	100%	Kg	295			
4.	Lime (Ca(OH) ₂)	93%	Kg	15			
5.	Dolomite lime (if any)	23%	Kg	9			
6.	Soda Ash (Na ₂ CO ₃)	98%	Kg	23			
7.	Acid (H ₂ SO ₄)	98%	Kg	9			
8.	Acid HCL	33%	Kg	2			
	Sludge dewatering system						
9.	Dewatering Polyelectrolyte for Centrifuge / Filter press	100%	Kg	256			
10.	Polyelectrolyte for feed on Thickener	100%	Kg	295			
	RO system						
11.	Antiscalant	100%	Kg	330			
12.	SBS	95%	Kg	34			
13.	Acid (H ₂ SO ₄)	98%	Kg	9			
14.	Acid (H ₂ SO ₄) for RO permeate pH correction	98%	Kg	9			
15.	Caustic (NaOH) (if any)	48%	Kg	47			
16.	Acid HCL	33%	Kg	2			
17.	SMBS	100%	Kg	40			
	ZLD system						
18.	Acid (H ₂ SO ₄)	98%	Kg	9			
19.	Antiscalant	100%	Kg	225			
20.	Antifoam	100%	Kg	365			

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F14
		VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 2 of 3

21.	Caustic (NaOH) (if any)	48%	Kg	47			
22.	Acid HCL	33%	Kg	2			
23.	Oxygen Scavenger	38%	Kg	169			
	UF CIP chemicals						
24.	Hypo for UF cleaning	10%	Kg	7			
25.	SBS for UF cleaning	95%	Kg	34			
26.	Citric acid for UF cleaning	100%	Kg	60			
27.	Caustic (NaOH)	48%	Kg	47			
	RO CIP chemicals						
28.	High PH RO cleaning	100%	Kg	200			
29.	Low PH RO cleaning	100%	Kg	200			
30.	Biocide (if any)	100%	Kg	500			
31.	Any other Chemicals						
32.	Total value						

NOTE:

Bidder shall note that while guaranteeing the Chemical consumption, the bidder shall necessarily include all Chemicals required under this package and same shall be considered for loading purpose during tender evaluation and for levying of penalty during performance guarantee test in case of excess Chemical consumption more than the guaranteed Chemical consumption as indicated by the bidder under column “**Guaranteed Qty.**” above, each Chemicals consumed for the system will be considered for this purpose.

If the bidders suggests any other chemicals required for the completion for the system under Sl. No. 31, the maximum unit Cost indicated among the bidders will be loaded to those bidders for evaluation.

Loading for Chemical consumption: For bid evaluation, the quantity of each Chemical consumed (as per the above table) for complete ZLD Plant shall be considered. The grand total value arrived under sl. No. 32 will be loaded for the bid evaluation for a period of 25years. Bidder should quote quantity for the given concentration of chemical only.

For penalty purpose, the Chemical consumption actually measured (as per the above table) individually during PG test conducted at YCCPP site, before handing over of the system to KPCL will be considered. Penalty will be levied at double the rate per Liters/Kg/Nos differential over and above the guaranteed Chemical consumption calculated for 25 years.

If successful bidder uses the chemical concentration other than mentioned in the above table during PG test, Price for such chemical shall be brought to the concentration mentioned in the table by pro-rata basis.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F14
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019		VOLUME-III
	SCHEDULES	
		Sheet 3 of 3

If any of the Chemical is not applicable for the system, bidder shall mention “**Not Applicable**” in the remark column.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY DESIGNATION _____

DATE _____

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION:F15
		VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 1 of 1

OPERATION & MAINTENANCE PRICE BREAK-UP-F15

(Bidder to fill-in and submit along with Bid)

Sl.No	Description	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1	Lumpsum firm price for Operation & Maintenance of plant and equipment on 24x7 basis for a period of Five years after handing over / issue of Notice To Proceed (NTP) inclusive of GST.					
2	Lumpsum firm price for spares & consumables inclusive of GST.					
3	Lumpsum firm price for Speciality chemicals inclusive of GST.					
4	Lumpsum firm price for Man power inclusive of GST.					
5	Lumpsum firm price for any other items inclusive of GST.					
6	Total Price					
7	Grand Total Price (sum of 1 st , 2 nd , 3 rd , 4 th and 5 th Year indicated under sl. No.6)					

Note:

- 1.0 The grand total Price indicated shall match with Price schedule-F1, Sl. No. 5.0 & 5.1. If there is any difference between the Prices indicated in Price schedule-F1 and Operation & Maintenance Price Break-Up-F15, Total Price indicated in Price schedule-F1 Sl. No. 5.0 & 5.1 towards O&M Cost prevails.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY

DESIGNATION _____

COMPANY _____

DATE _____

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

DRAWING NO.
PE-DG-409-505-E001

1

2

3

4

5

6

7

NO COMMENTS

SINGLE LINE DIAGRAM OF 6.6 KV UNIT SWITCH BOARD #1CA METERING AND PROTECTION

FICHTNER Consulting Engineers (India)
Private Limited

VENDOR DOCUMENT REVIEW STATUS

- ☒ Approved: Drawing Approved for submission, Database distribution ready.
- ☐ Approved: Drawing Approved for submission, Proposed submittal, Design Modification / Change order / Revision / Comments not received for review / Modification.
- ☐ Approved: Drawing for Approval, Forwarding request.
- ☐ Approved: Forwarding request for review, not proceeding with comments and return for revision.
- ☐ Approved: Drawing not for approval, only for information.
- ☐ Approved: Drawing forwarded to the drawing in model.

This is a record of approval in the general compliance with the Contract documents. It does not constitute a final approval of the design or construction. The Vendor / Contractor is responsible for compliance with the contract documents. Approval of documents does not release the Vendor / Contractor of his responsibility, in compliance of the contract documents, and it does not constitute a release of the contract documents. It is the responsibility of the Vendor / Contractor to ensure compliance with the contract documents.

File No: PE-DG-409-505-E001 dated 07.12.2016


K. Muthuramalingam (P.E. - EIT)
Encl: MS

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	JOB NO.	
02	21.11.16	AKD	MS	PD	01	26.09.16	AKD	MS	PD	409	
Revised in line with revision of CT/VT Calculation.					Revised in line with customer comments received on rev.00 dated 24.09.16					STATUS	CONTRACT
										DISTRIBUTION	
										TO	
										NO.	



KARNATAKA POWER CORPORATION LIMITED

FICHTNER
CONSULTANTFICHTNER CONSULTING ENGINEERS (INDIA)
PVT. LIMITED

PROJECT YELAHANKA CCPP (1X370 MW)

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDATITLE SINGLE LINE DIAGRAM OF 6.6KV UNIT
SWITCH BOARD #1CA
METERING AND PROTECTION

DEPT CODE	DRN	NAME AKD	SIGN	DATE
E	DSGN	AKD		
	CHD	MS		
	APPD	PD		

DRAWING NO.
PE-DG-409-505-E001
SHEET 01 OF 11 REV. 02COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

PE-DG-409-505-E001
DRAWING NO.**LEGEND**

49 TRFR. WINDING TEMP. INDICATOR
 49Q TRFR. OIL TEMP. INDICATOR
 52CS BREAKER CONTROL SWITCH
 63 TRFR. BUCCHOLZ RELAY
 PR TRFR. PRESSURE RELIEF VALVE (PRV)
 63Q TRFR. OIL LEVEL INDICATOR

SRSS SWGR./REMOTE CONTROL
 SELECTOR SWITCH
 DDCMIS DISTRIBUTED DIGITAL CONTROL
 MONITORING & INFORMATION SYSTEM

GRP GENERATOR RELAY PANEL
 (NO) NORMALLY OPEN
 (NC) NORMALLY CLOSED

ONAN : OIL FILLED TRANSFORMER
 WITH NATURAL COOLING

 VACUUM CIRCUIT BREAKER

 FUSE

 CURRENT TRANSFORMER (CT)

 CORE BALANCE CT (CBCT)

 TRANSFORMER

 EARTHING

 DRAW OUT

 TRANSDUCER

 CABLE TERMINATION

 ISOLATED PHASE
 BUS DUCT CONNECTION

 SEGREGATED PHASE
 BUS DUCT CONNECTION

Rct CT RESISTANCE

 PLANNED CHANGEOVER FACILITY
 WITH MOMENTARY PARALLELING

 SURGE SUPPRESSOR (ZnO TYPE)

 DIGITAL MULTI FUNCTION METER

 AMMETER

 VOLT METER

 VOLTMETER SELECTOR SWITCH

 AMMETER SELECTOR SWITCH

 INDICATION LAMP(LED CLUSTER TYPE)

 MOTOR

GCP GENERATOR CONTROL PANEL

 DENOTES SYNCHRONISING CHECK FACILITY
 ACROSS THE CIRCUIT BREAKER.

 ONLY TWO OUT OF THREE CAN BE CLOSED
 (ELECTRICAL INTERLOCK)

 AUTO CHANGEOVER FACILITY WITH SLOW CHANGEOVER AS BACKUP

Vk KNEE VOLTAGE

Ie EXCITATION CURRENT

INDICATIONS

R,Y,B 'RED', 'YELLOW', 'BLUE' - PHASE SUPPLY 'ON'

R1 'RED' - BKR. 'ON'

G 'GREEN' - BKR. 'OFF'

A 'AMBER' - BREAKER AUTO TRIP

B1 'BLUE' - BKR. SPRING CHARGED

W1 'WHITE' - TRIP CIRCUIT HEALTHY

W2 'WHITE' - LOCKOUT RELAY HEALTHY

W3 'AMBER' - BREAKER IN SERVICE POSITION

W4 'AMBER' - BREAKER IN TEST POSITION

COPY RIGHT AND CONFIDENTIAL
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
 It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD
------	------	------	-----	------	------	------	------	-----	------	------	------	------	-----	------



BHARAT HEAVY ELECTRICALS LTD.
 POWER SECTOR
 PROJECT ENGINEERING MANAGEMENT
 NOIDA

YELAHANKA CCPP
 (1X370MW)

TITLE SINGLE LINE DIAGRAM OF 6.6kV UNIT
 SWITCH BOARD # 1CA
 METERING AND PROTECTION

DRAWING NO.
 PE-DG-409-505-E001
 SHEET 02 OF 11 REV. 02

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

DRAWING NO.
PE-DG-409-505-E001

1

2

3

4

5

6

7

REFERENCE DRAWINGS

1. ELECTRICAL SINGLE LINE DIAGRAM FOR A.C AUXILIARY POWER DISTRIBUTION
DRG.NO. PE-DG-409-565-E001.
2. CT/VT CALCULATION FOR 6.6 KV STATION SWBD (METERING AND PROTECTION)
DRG. NO. PE-DC-409-E006, REV-0

NOTES

1. ALL INSTRUMENTS & RELAYS ARE MOUNTED IN 6.6KV SWITCHGEAR UNLESS OTHERWISE SPECIFIED.
2. NUMBERS SHOWN ON THE RIGHT SIDE OF VARIOUS DEVICES INDICATE QUANTITY OF THE DEVICE.
3. EXACT MAKES, TYPE & COMBINATION OF RELAYS SHALL BE INDICATED AFTER FINALISATION OF THE SAME BY BHEL BHOPAL.
4. AUXILIARY RELAYS / TIMERS etc. SHALL BE PROVIDED AS PER FINAL SCHEME REQUIREMENTS. ALL RELAYS (EXCEPT LOCKOUT RELAY '86') CONTACTS SHALL BE SELF RESET TYPE WITH LED INDICATION. THE CONTACTS OF LOCKOUT RELAY '86' SHALL BE HAND RESET TYPE.
5. THE INTERPOSING RELAYS (K11 & K12) FOR CLOSE AND TRIP COMMAND FROM REMOTE TO ALL 6.6KV CBs SHALL BE PROVIDED IN 6.6KV SWITCHGEAR.
6. EQUIPMENT RATINGS INDICATED ARE AT AN AMBIENT OF 50° C.
7. THE NUMBER WITHIN '()' SHOWN BESIDE THE VARIOUS FEEDERS IN THE SLD DENOTES PANEL SEQUENCE No. TENTATIVE WHEN VIEWED FROM THE FRONT FROM LEFT TO RIGHT.
8. BUSDUCTS ARE ENVISAGED TO BE SUITABLE FOR TOP ENTRIES, WHEREAS CABLE FOR BOTTOM ENTRIES.
9. FOR EACH 6.6KV SWITCHBOARD, TWO NUMBER 415V, 3 Ph., 4 WIRE FEEDERS OF ADEQUATE RATING SHALL BE PROVIDED FOR PANEL LIGHTING/SPACE HEATING AND MOTOR SPACE HEATING REQUIREMENT. MANUAL CHANGEOVER FACILITIES FOR THE SAME SHALL BE PROVIDED AT THE 6.6KV SWITCHBOARD.
10. THE 6.6KV SWITCH BOARDS SHALL HAVE PROVISION FOR BUS-BAR EXTENTION ON EITHER SIDE FOR FUTURE EXPANSION.
11. FOR EACH 6.6KV SWITCH BOARD TWO NOS. OF 220V DC FEEDERS SHALL BE PROVIDED. NECESSARY CONTACTOR CHANGEOVER ARRANGEMENT FOR THE SAME TO BE MADE AT THE 6.6KV SWITCH BOARD.
12. CABLE LUGS AND GLANDS FOR POWER & CONTROL CABLES SHALL BE SUPPLIED WITH THE SWITCHGEAR BY BHEL-BHOPAL.
13. CBCT SHALL BE SELECTED BASED ON PRIMARY CURRENT RATING OF MINIMUM 10A. OTHER CBCT DETAILS SHALL BE SHOWN IN BHEL-BHOPAL DRG.
14. ALL INCOMER AND TRANSFORMER FEEDERS SHALL BE PROVIDED DIGITAL MFM METER TO READ VOLTAGE, CURRENT, FREQUENCY, POWER FACTOR, POWER AND ENERGY. ALL OUTGOING MOTOR FEEDERS SHALL HAVE ANALOG AMMETER TO READ CURRENT. ANALOG METERS SHALL BE TAUT BAND TYPE OF ACCURACY 0.5

15. INDICATIONS SHALL BE PROVIDED BY CLUSTER TYPE LEDs.

16. ALL NUMERICAL RELAYS SHALL HAVE COMMUNICATION ON TWO PORTS. LOCAL FRONT PORT RS-232 FOR COMMUNICATION TO LAPTOP FOR RETRIEVING DATA FROM NUMERICAL RELAY & UPLOADING SETTINGS AND SECOND PORT ON IEC-61850 TO COMMUNICATE WITH DATA CONCENTRATOR THROUGH LAN & EARTHNET SWITCHES. THE NUMERICAL REALS SHALL BE NETWORKED THROUGH DATA CONCENTRATOR TO HMI & INTEGRATED TO DDCMIS FOR DIAGNOSTICS & STATUS MONITORING.

17. THE AUXILIARY SUPPLY FOR TRANSDUCER & RELAYS SHALL BE 220V DC WITH +10% TO -15% VARIATION

18. PANEL SEQUENCE SHALL & PHASE SEQUENCE SHALL BE AS PER LAYOUT
DRAWING NO.: PE-DG-409-100-E004.

19. ALL NUMERICAL RELAYS SHALL BE SUITABLY LOOPED WITHIN SWITCHGEAR BY BHEL-BHOPAL.

20. ALL THE FEEDERS SHALL BE REMOTE CONTROLLED FROM DDCMIS, SWITCHGEAR SCADA & FROM LOCAL CONSOLE OF THE NUMERICAL RELAYS.

21. FOR REF PROTECTION, RELAY SHOULD HAVE SENSITIVE ELEMENT AND ALSO RHEOSTAT RANGE SHOULD BE 0-4000 OHM.

22. THE AUXILIARY SUPPLY FOR TRANSDUCERS & RELAYS SHALL BE 220V DC WITH +10% TO -15% VARIATION.

23. MFM WITH ACCURACY 0.2 ARE ENVISAGED FOR ALL FEEDERS WITH RS485 PORT.

24. CABLE ARMOUR SHALL BE GROUNDED BEFORE CBCT, WHENEVER IT IS MOUNTED IN INSIDE SWITCHGEAR.

25. CT SHALL HAVE FAULT LEVEL OF 40 KA FOR 1 SECOND.

26. REMOTE CONTROL OF ALL BREAKERS OF UNIT SWITCHBOARD 1CA IS PROVIDED IN DDCMIS. FOLLOWING BREAKERS OF UNIT SWITCHBOARD 1CA SHALL BE CONTROLLED FROM ECP ALSO:

a) INCOMING & BUSCOUPLER BREAKERS OF UNIT SWITCHBOARD.

27. AUTO CHANGEOVER:

FAST BUS CHANGEOVER FOR 6.6KV UNIT SWITCHGEAR FOR INCOMER TO BUSCOUPLER IN THE EVENT OF FAILURE OF ONE INCOMER. SLOW CHANGEOVER IS PROVIDED AS BACKUP TO FAST CHANGEOVER LOGIC FOR FASTBUS TRANSFER & SLOW CHANGEOVER SHALL BE REALISED IN BTS PANEL.

COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

TITLE SINGLE LINE DIAGRAM OF 6.6KV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTION

YELAHANKA CCPP
(1X370MW)

DRAWING NO.
PE-DG-409-505-E001
SHEET 3 OF 11 REV. 02

CUSTOMER'S DRAWING NO.

COPY RIGHT AND CONFIDENTIAL

The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
it must not be used directly or indirectly in any way detrimental to the interest of the company.

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD

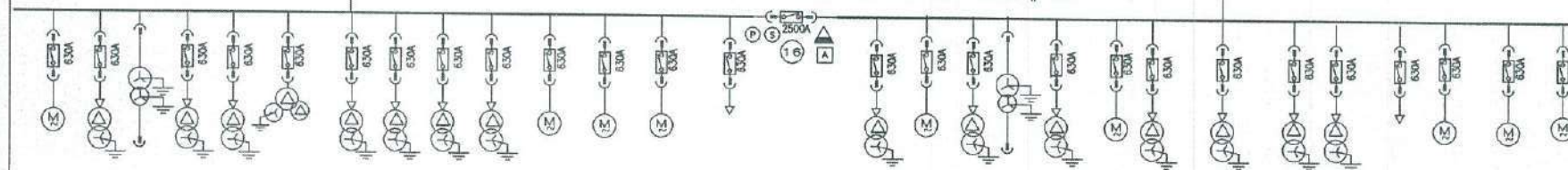
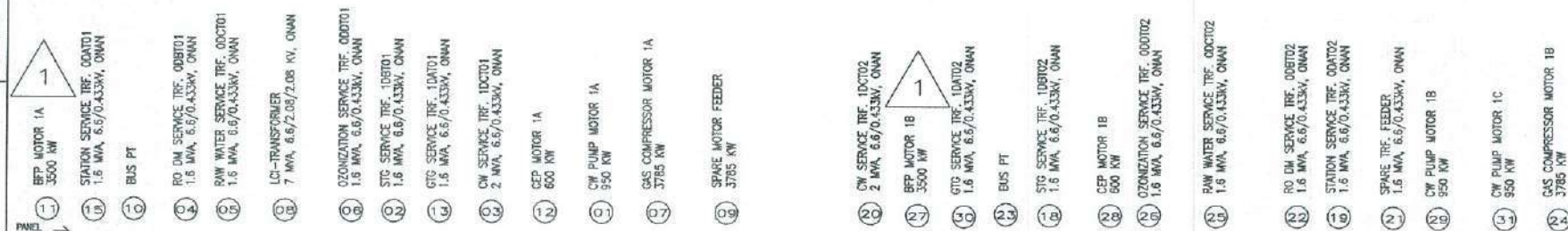


BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

TITLE SINGLE LINE DIAGRAM OF 6.6kV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTION

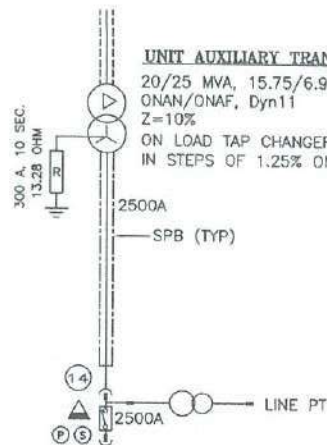
YELAHANKA CCPP
(1X370MW)

DRAWING NO.
PE-DG-409-505-E001
SHEET 4 OF 11
REV. 02



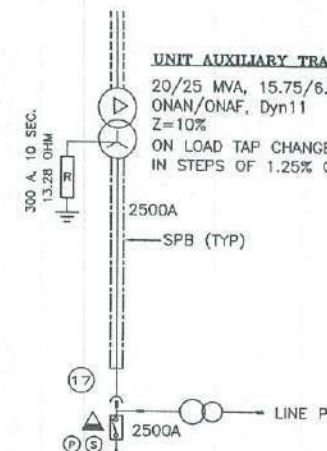
UNIT AUXILIARY TRANSFORMER # 1

20/25 MVA, 15.75/6.9kV
ONAN/ONAF, Dyn11
Z=10%
ON LOAD TAP CHANGER -10% TO +10%
IN STEPS OF 1.25% ON HV SIDE



UNIT AUXILIARY TRANSFORMER # 2

20/25 MVA, 15.75/6.9kV
ONAN/ONAF, Dyn11
Z=10%
ON LOAD TAP CHANGER -10% TO +10%
IN STEPS OF 1.25% ON HV SIDE



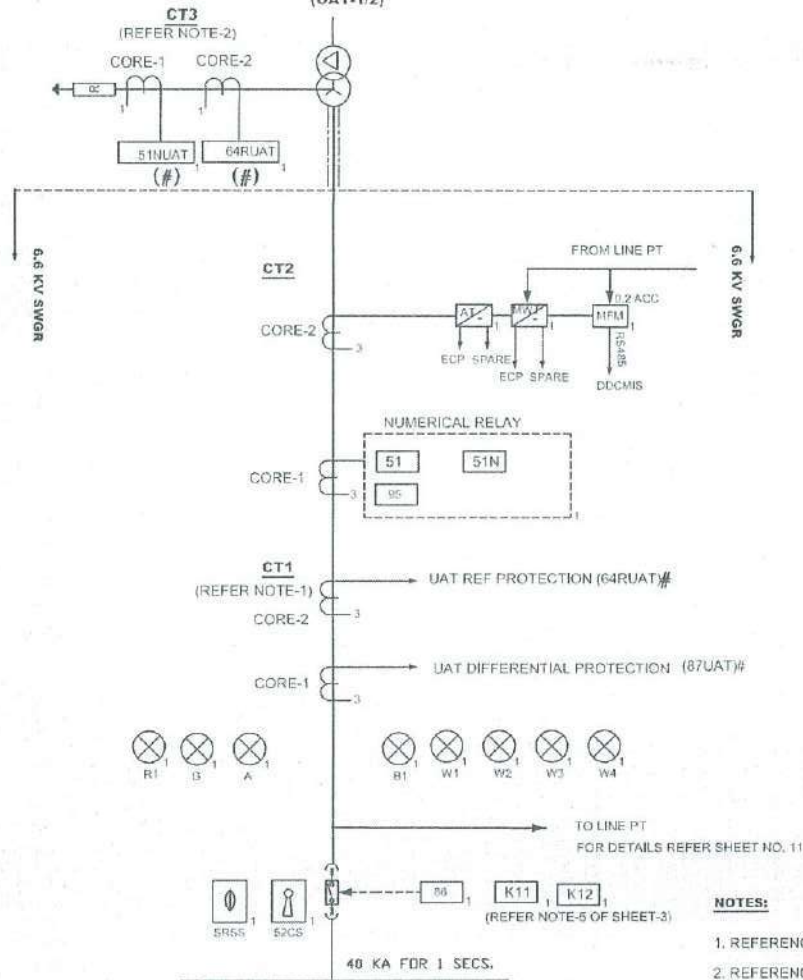
DRAWING NO.
PE-DG-409-505-E001

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

DRAWING NO.
PE-DG-409-505-E001UNIT AUX. TRANSFORMER
(UAT-1/2)

6.6kV UNIT SWITCH BOARD # 1CA

: LOCATED AT GRP (GENERATOR RELAY PANEL)

RELAY DETAILS

RELAY CODE	DESCRIPTION	TYPE	MAKE
51N	STANDBY IDMT EARTH FAULT PROTECTION	NUMERICAL	APPROVED MAKE
51	IDMT OVERCURRENT PROTECTION (3-PHASE)		
95	C.B. TRIP COIL SUPERVISION RELAY		
86	LOCKOUT RELAY	VAJHM23/EQVT.	AREVA/EQVT APP. MAKE
K11, K12	INTERPOSING RELAYS	RE302	JYOTI/EQVT APP. MAKE

CT DETAILS

APPLICABLE FEEDER	CT NO.	CORE NO.	CT RATIO	ACC. CLASS	BURDEN	VK $\geq$	Ie $\leq$
1CA INCOMER	CT1	1	2500/1 A	PS		40Rct + 50V	30 mA at VK/2
		2	2500/1 A			20Rct + 50V	30 mA at VK/2
	CT2	1	2500/1 A	5P20	10 VA	-	-
		2	2500/1 A	0.5 S	10 VA	-	-
	CT3	1	300/1 A	5P20	15VA	-	-
		2	2500/1 A	PS		20Rct + 50V	30 mA at VK/2

TRANSDUCER DETAILS

APPLICABLE SWBD.	DEVICE NO.	RANGE	OUTPUT	NO. OF OUTPUT	ACC. CLASS
1CA	AT	0-2500 A	4-20 mA	2	0.5
	MWT	0-25 MW	4-20 mA	2	0.5

NOTES:

- REFERENCE DRAWING NO: PE-DG-409-510-E001 FOR GENERATOR CIRCUIT BREAKER & METERING CT DETAILS SAME AS CT-14
- REFERENCE DRAWING NO: PE-DG-409-510-E001 FOR GENERATOR CIRCUIT BREAKER & METERING CT DETAILS SAME AS BCTN-13

INCOMER FROM UAT

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDATITLE SINGLE LINE DIAGRAM OF 6.6kV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTIONYELAHANKA CCPP
(1X370MW)DRAWING NO.
PE-DG-409-505-E001

SHEET 5 OF 11 REV. 02

COPY RIGHT AND CONFIDENTIAL
The Information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

DRAWING NO.
PE-DG-409-505-E001

1

2

3

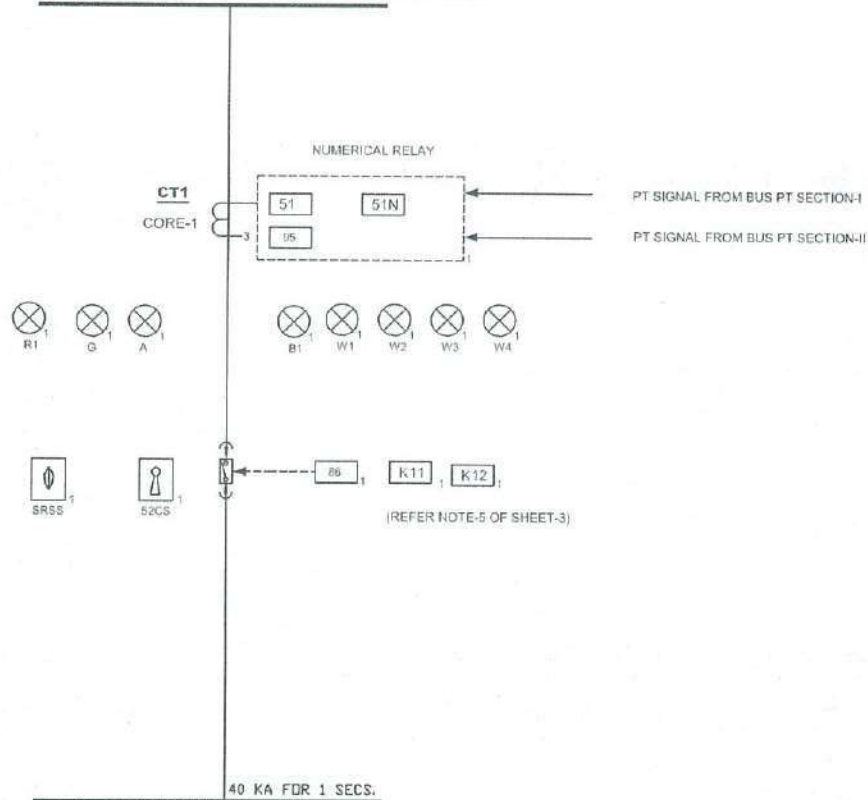
4

5

6

7

6.6kV UNIT SWITCH BOARD # 1CA SEC-A 40 KA FOR 1 SECS.



RELAY DETAILS

RELAY CODE	DESCRIPTION	TYPE	MAKE
51N	STANDBY IDMT EARTH FAULT PROTECTION	NUMERICAL	APPROVED MAKE
51	IDMT OVERCURRENT PROTECTION (3-PHASE)		
95	C.B. TRIP COIL SUPERVISION RELAY		
86	LOCKOUT RELAY	VAJHM32/EQVT.	AREVA/ APPROVED MAKE
K11, K12	INTERPOSING RELAYS	RE302	JYOTI/APPROVED MAKE

CT DETAILS

APPLICABLE FEEDER	CT NO.	CORE NO.	CT RATIO	ACC. CLASS	BURDEN
1CA B/C	CT1	1	2500/1 A	5P20	10 VA

6.6kV UNIT SWITCH BOARD # 1CA SEC-B

40 KA FOR 1 SECS.

BUS COUPLER AT 6.6kV UNIT SWBD.-1CA

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD
------	------	------	-----	------	------	------	------	-----	------	------	------	------	-----	------



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

YELAHANKA CAPP
(1X370MW)

TITLE

SINGLE LINE DIAGRAM OF 6.6kV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTION

DRAWING NO.

PE-DG-409-505-E001

SHEET 6 OF 11

REV. 02

COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

64R

DRAWING NO.
PE-DG-409-505-E001

1

2

3

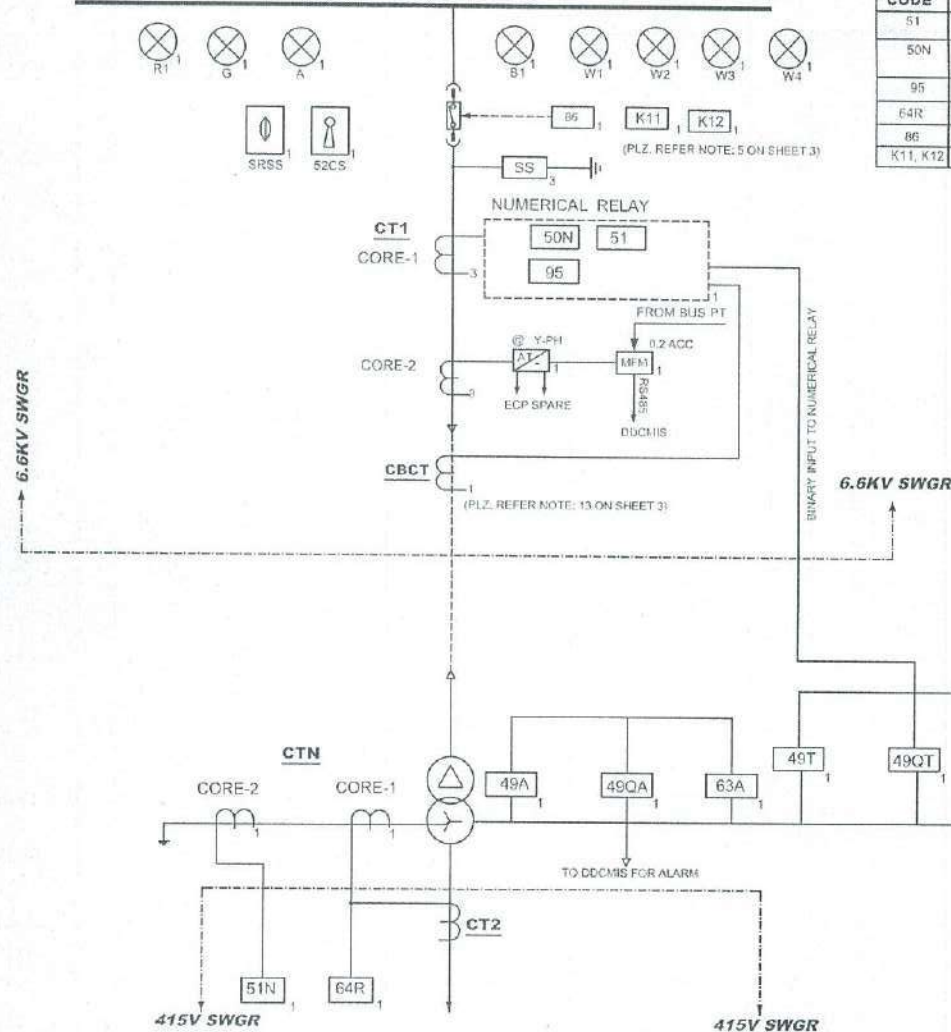
4

5

6

7

6.6KV UNIT SWITCHBOARD # 1CA 40 KA FOR 1 SECS.



RELAY DETAILS

RELAY CODE	DESCRIPTION	TYPE	MAKE
51	IDMT OVER CURRENT PROTECTION (3-PHASE)	NUMERICAL RELAY	APPROVED MAKE
50N	SENSITIVE EARTH FAULT PROTECTION		
95	CB TRIP COIL SUPERVISION RELAY		
64R	RESTRICTED EARTH FAULT PROTECTION RELAY	NUMERICAL RELAY	APPROVED MAKE
86	LOCKOUT RELAY	VAJHM23/EQVT.	AREVA/ APPROVED MAKE
K11, K12	INTERPOSING RELAY	RE302	JYOTI/ APPROVED MAKE

CT DETAILS

* APPLICABLE FEEDER	CT NO.	CORE NO.	CT RATIO	ACC. CLASS	BURDEN (V _k , I _{sc} , R _{ct})	POWER CABLE
00AT01/00AT02 1600 KVA (6.6KV/433V) Z=8%	CT1	1	200/1 A	5P20	10 VA	3CX150 XLPE, AL, ARMoured
		2	200/1 A	0.5 S	10 VA	
	CTN	1	2500/1 A	PS	V _k > 30R _{ct} +50V I _{sc} < 30 mA at V _k /2	2
		2	2500/1 A	5P20	10 VA	
1DCT01/1DCT02 2000 KVA (6.6KV/433V) Z=8%	CT1	1	200/1 A	5P20	10 VA	3CX150 XLPE, AL, ARMoured
		2	200/1 A	0.5 S	10 VA	
	CTN	1	3200/1 A	PS	V _k > 30R _{ct} +50V I _{sc} < 30 mA at V _k /2	2
		2	3200/1 A	5P20	10 VA	
	CT2	1	3200/1 A	5P20	10 VA	

TRANSDUCER DETAILS

APPLICABLE TRANSFORMER	DEVICE NO.	RANGE	OUTPUT	NO. OF OUTPUT	ACC. CLASS
1600 KVA 00AT01/00AT02	AT	0-200 A	4-20 mA	2	0.5
2000 KVA 1DCT01/1DCT02	AT	0-200 A	4-20 mA	2	0.5

NOTE

- * FOR PARAMETERS OF REMAINING 1.6 MVA AUXILIARY TRANSFORMERS PLEASE REFER CT/VT CALCULATION ANNEXURE-A
 * APPLICABLE FOR AUXILIARY TRANSFORMER FOR GTG ONLY

TYPICAL OUTGOING TRANSFORMER FEEDER

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

TITLE SINGLE LINE DIAGRAM OF 6.6KV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTION

YELAHANKA CAPP
(1X370MW)

DRAWING NO.
PE-DG-409-505-E001
SHEET 7 OF 11 REV. 02

COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

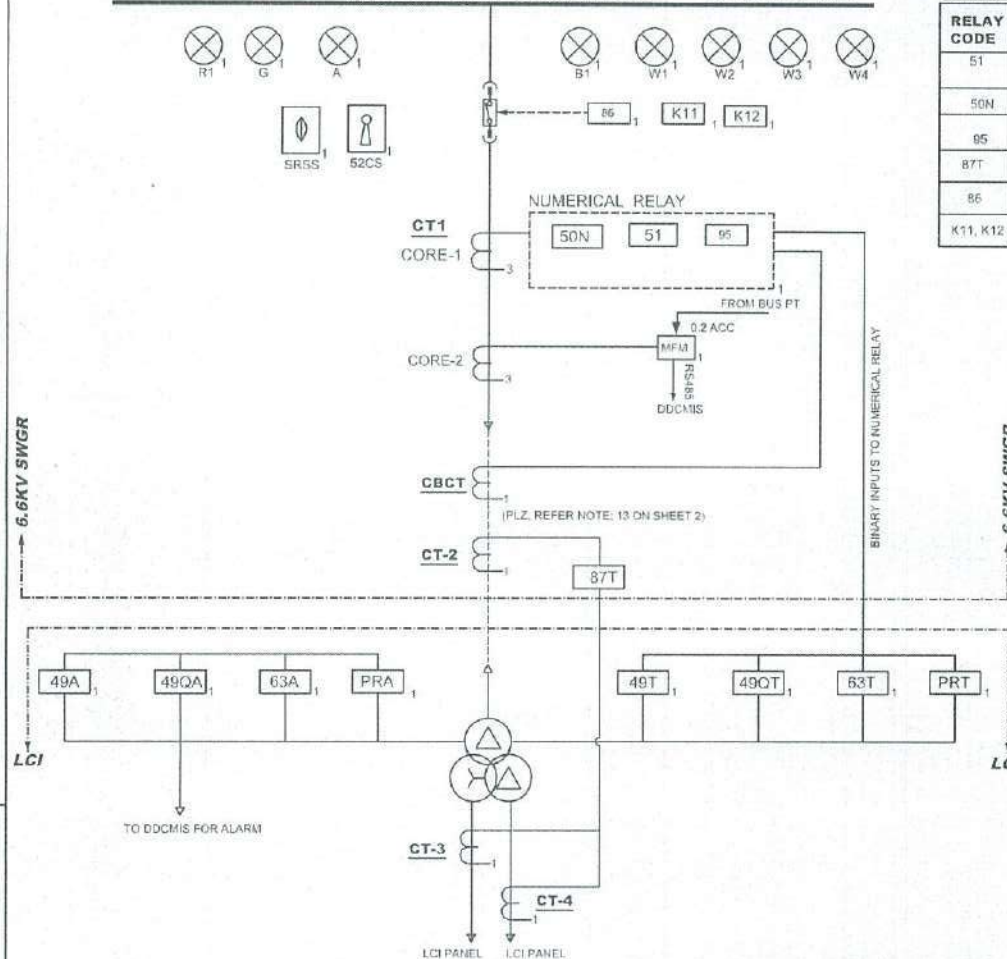
CUSTOMER'S DRAWING NO.

PE-DG-409-505-E001
DRAWING NO.

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

6.6KV UNIT SWITCHBOARD # 1CA 40 KA FOR 1 SECS.



RELAY DETAILS

RELAY CODE	DESCRIPTION	TYPE	MAKE
51	IDMT OVER CURRENT PROTECTION (3-PHASE)	NUMERICAL	APPROVED MAKE
50N	SENSITIVE EARTH FAULT PROTECTION		
95	CB TRIP COIL SUPERVISION RELAY	NUMERICAL	APPROVED MAKE
87T	TRFR. DIFFERENTIAL PROTECTION RELAY		
86	LOCKOUT RELAY	VAJHM23/EQVT.	AREVA/APPROVED MAKE
K11, K12	INTERPOSING RELAY	RE302	JYOT/APPROVED MAKE

CT DETAILS

APPLICABLE FEEDER	CT NO.	CORE NO.	CT RATIO	ACC. CLASS	BURDEN (V _k , I _e , R _{ct})	POWER CABLE
LCI TRANSFORMER 7000KVA (6.6/2.08/2.08 KV)	CT1	1	800/1 A	5P20	10 VA	3X3-1C-400 (3 RUNS PER PHASE)
		2	800/1 A	0.5 S	10 VA	
	CT2	1	800/1 A	PS	V _k ≥ 40 R _{ct} +50V I _e ≤ 30 mA at V _k /2	
	CT3	1	2500/1 A	PS	V _k ≥ 40 R _{ct} +50V I _e ≤ 30 mA at V _k /2	
	CT4	1	2500/1 A	PS	V _k ≥ 40 R _{ct} +50V I _e ≤ 30 mA at V _k /2	

TRANSDUCER DETAILS

APPLICABLE TRANSFORMER	DEVICE NO.	RANGE	OUTPUT	NO. OF OUTPUT	ACC. CLASS
LCI	AT	0-800 A	4-20 mA	2	0.5

OUTGOING FEEDER FOR LC1 TRANSFORMER

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD
------	------	------	-----	------	------	------	------	-----	------	------	------	------	-----	------

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA
TITLE SINGLE LINE DIAGRAM OF 6.6KV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTION

YELAHANKA CCPP
(1X370MW)

DRAWING NO.
PE-DG-409-505-E001
SHEET 8 OF 11
REV. 02

COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.

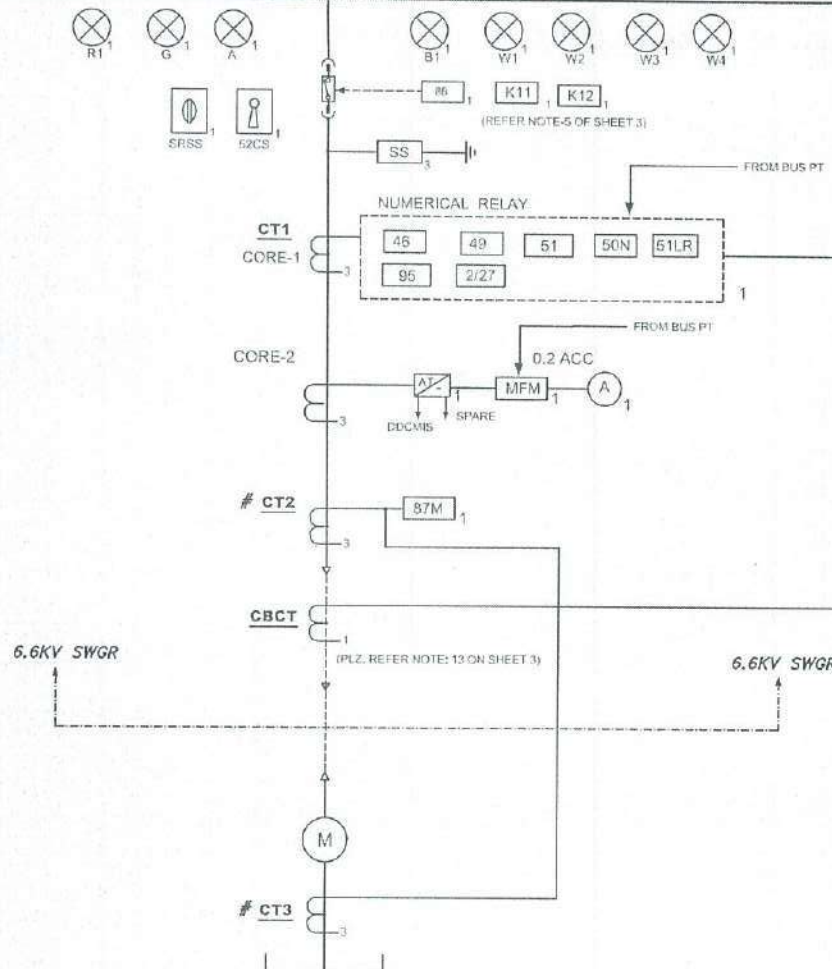
FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

DRAWING NO.
PE-DG-409-505-E001

6.6KV UNIT SWITCHBOARD # 1CA

40 KA FOR 1 SECS.



- CT3 SHALL BE SUPPLIED LOOSE BY MV SWITCHGEAR SUPPLIER TO BE MOUNTED IN NEUTRAL TERMINAL BOX OF MOTOR BY MOTOR SUPPLIER. NECESSARY CO-ORDINATION WITH MOTOR MANUFACTURER TO BE DONE BY SWITCHGEAR MANUFACTURER.
- # APPLICABLE TO MOTOR FEEDERS 1000 KW AND ABOVE

RELAY DETAILS

DEVICE NO.	DESCRIPTION	TYPE	MAKE
45	NEGATIVE SEQUENCE PROTECTION	NUMERICAL	APPROVED MAKE
49	THERMAL OIL PROTECTION (HOT & COLD)		
51	UNIT OVER CURRENT PROTECTION		
51N	SENSITIVE EARTH FAULT PROTECTION		
51LR	LOCKED MOTOR PROTECTION		
95	C.B. TRIP COIL SUPERVISION RELAY		
2/27	TIME DELAYED UNDER VOLTAGE PROTECTION	VARIABLE	APPROVED MAKE
50	LOCKOUT RELAY		
87M	DIFFERENTIAL PROTECTION	NUMERICAL	APPROVED MAKE
K11, K12	INTERPOSING RELAY	PLK2	APPROVED MAKE

CT DETAILS

APPLICABLE FEEDER	CT NO.	CORE NO.	CT RATIO	ACC. CLASS	BURDEN VK/VA	POWER CABLE
BFP MOTOR (1500KW)	CT1	1	400/1A	5P20	10 VA	3X10-903
	CT2	2	400/1A	0.5S	10 VA	
	CT3	3	400/1A	0.5S	10 VA	
GAS COMPRESSOR MOTOR (1785 KW)	CT1	1	400/1A	5P20	10 VA	3X10-100
	CT2	2	400/1A	0.5S	10 VA	
	CT3	3	400/1A	0.5S	10 VA	
CEP MOTOR (800 KW)	CT1	1	75/1A	5P20	10 VA	3X10-150
	CT2	2	75/1A	0.5S	10 VA	
CW PUMP MOTOR (550 KW)	CT1	1	150/1A	5P20	10 VA	3X10-150
	CT2	2	150/1A	0.5S	10 VA	

TRANSDUCER DETAILS

APPLICABLE FEEDER	DEVICE NO.	RANGE	OUTPUT	NO. OF OUTPUT	ACCURACY CLASS
BFP MOTOR (1500KW)	AT	0-400-2000A	4-10-20 mA	2	0.5
GAS COMPRESSOR MOTOR (1785 KW)	AT	0-400-2000A	4-10-20 mA	2	0.5
CEP MOTOR (800 KW)	AT	0-75-400A	4-10-20 mA	2	0.5
CW PUMP MOTOR (550 KW)	AT	0-150-800A	4-10-20 mA	2	0.5

AMMETER DETAILS

APPLICABLE FEEDER	DEVICE NO.	RANGE	ACCURACY CLASS
BFP MOTOR (1500KW)	A	0-400-2000A	0.5
GAS COMPRESSOR MOTOR (1785 KW)	A	0-400-2000A	0.5
CEP MOTOR (800 KW)	A	0-75-400A	0.5
CW PUMP MOTOR (550 KW)	A	0-150-800A	0.5

1

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD
------	------	------	-----	------	------	------	------	-----	------	------	------	------	-----	------



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

YELAHANKA CCPP
(1X370MW)

TITLE SINGLE LINE DIAGRAM OF 6.6KV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTION

DRAWING NO.
PE-DG-409-505-E001
SHEET 9 OF 11
REV. 02

COPY RIGHT AND CONFIDENTIAL
The information on this document is the property of Bharat Heavy Electricals Limited
It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

DRAWING NO. PE-DG-409-505-E001

1

2

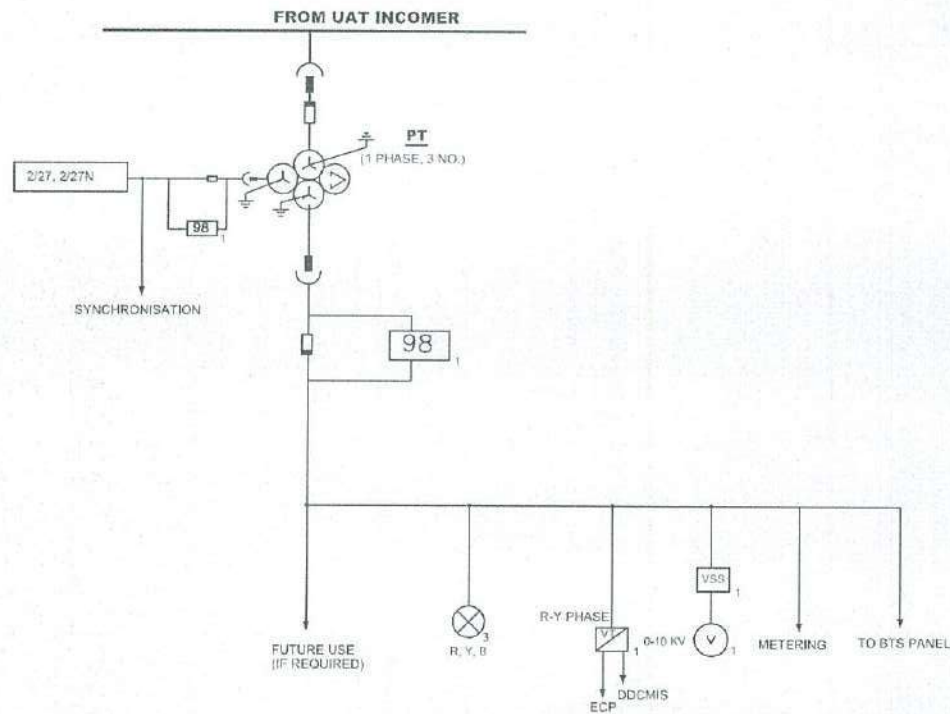
3

4

5

6

7



RELAY DETAILS

RELAY CODE	DESCRIPTION	TYPE	MAKE
98	FUSE FAILURE RELAY	VAPM31	AREVA / APPROVED MAKE
2/27	TIME DELAYED UNDER VOLTAGE PROTECTION	NUMERICAL	APPROVED MAKE
2/27N	TIME DELAYED NO VOLTAGE PROTECTION		

PT DETAILS

APPLICABLE FEEDER	VOLTMETER RANGE	PT RATIO	ACC. CLASS	BURDEN	REMARKS
LINE PT	0-10 KV	$\frac{6.6KV}{\sqrt{3}} / \frac{110V}{\sqrt{3}}$ $\frac{110V}{\sqrt{3}} / \frac{110V}{\sqrt{3}}$	0.2/(3PY (3P)/(3P))	50VA/50VA/50VA	LINE PT (1-PH, 3 NOS.)

TRANSDUCER DETAILS

APPLICABLE FEEDER	DEVICE NO.	RANGE	OUTPUT	NO. OF OUTPUT	ACCURACY CLASS
LINE PT	VT	0-10 K V	4-20 mA	2	0.5

INCOMER LINE-PT

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD

TITLE

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

SINGLE LINE DIAGRAM OF 6.6kV UNIT
SWITCH BOARD # 1CA
METERING AND PROTECTION

YELAHANKA CCPP
(1X370MW)

DRAWING NO.

PE-DG-409-505-E001

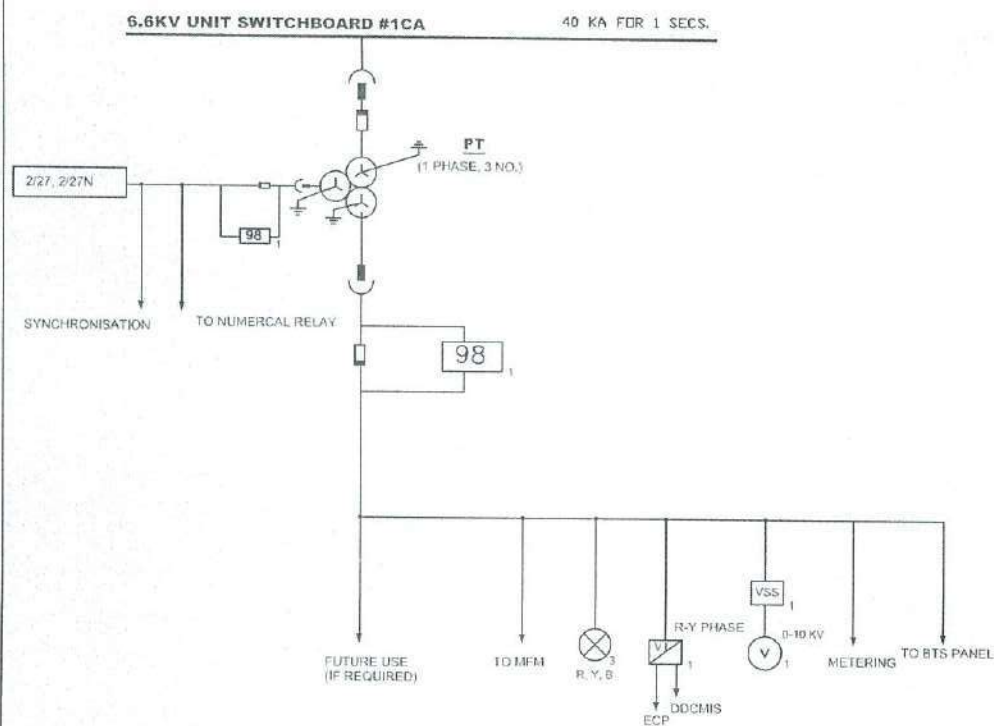
SHEET 10 OF 11

REV. 02

COPY RIGHT AND CONFIDENTIAL

The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
It must not be used directly or indirectly in any way detrimental to the interest of the company.

CUSTOMER'S DRAWING NO.



NOTE: DC FAIL INDICATING LAMPS SHOWN ABOVE IS APPLICABLE FOR ONE COMPLETE BOARD.

RELAY DETAILS

RELAY CODE	DESCRIPTION	TYPE	MAKE
27	TIME DELAYED UNDER VOLTAGE PROTECTION	NUMERICAL	APPROVED MAKE
27N	TIME DELAYED NO VOLTAGE PROTECTION		
98	FUSE FAILURE RELAY	VAPM31 / EQVT	AREVA / APPROVED MAKE

PT DETAILS

APPLICABLE FEEDER	VOLTMETER RANGE	PT RATIO	ACC. CLASS	BURDEN	REMARKS
BUS PT SEC-1 & SEC-2	0-10 KV	$\frac{6.6KV}{\sqrt{3}} \bigg/ \frac{110V}{\sqrt{3}}$ $\bigg/ \frac{110V}{\sqrt{3}}$	0.2(3PY (3P)	50VA/60VA	LINE PT (1-PH, 3 NOS.)

TRANSDUCER DETAILS

APPLICABLE FEEDER	DEVICE NO.	RANGE	OUTPUT	NO. OF OUTPUT	ACCURACY CLASS
BUS PT	VT	0-10 K V	4-20 mA	2	0.5

BUS-PT

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD
------	------	------	-----	------	------	------	------	-----	------	------	------	------	-----	------

	BHARAT HEAVY ELECTRICALS LTD. POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA
TITLE	SINGLE LINE DIAGRAM OF 6.6kV UNIT SWITCH BOARD # 1CA METERING AND PROTECTION

YELAHANKA CAPP (1X370MW)	
DRAWING NO. PE-DG-409-505-E001	
SHEET 11 OF 11	REV. 02

KPCL APPROVED SUB -VRENDOR LIST- ANNEXURE-A

S.No.	Package Name	S.NO	Vendor Name	Approval Status [Approved / Not Approved]	REMARKS, if any
C&I					
1	CONTROL VALVE	1	DRESSER VALVE INDIA PVT. LTD	APPROVED	
		2	EMERSON PROCESS MANAGEMENT CHENNAI LIMITED	APPROVED	
		3	FORBES MARSHALL ARCA PVT.LTD.	APPROVED	
		4	INSTRUMENTATION LTD.	APPROVED	
		5	KOSO INDIA PRIVATE LIMITED,	APPROVED	
		6	METSO SINGAPORE PTE. LTD.	APPROVED	
		7	MIL CONTROLS LTD.	APPROVED	
		8	PARCOL S.p.A	APPROVED	
		9	VALVITALIA S.P.A. ,	APPROVED	
		10	WALDEMAR PRUSS ARMATURENFABRIK GMBH	APPROVED	
2	FLOW ELEMENT- ORIFICE	1	INSTRUMENTATION ENGINEERS PVT LTD	APPROVED	
		2	INSTRUMENTATION LTD.	APPROVED	
		3	MICRO PRECISION PRODUCTS PVT. LTD.	APPROVED	
3	FLOW ELEMENT- NOZZLE	1	INSTRUMENTATION LTD.	APPROVED	
		2	MICRO PRECISION PRODUCTS PVT. LTD.	APPROVED	
		3	MINCO (INDIA) FLOW ELEMENTS PVT. LTD.	APPROVED	
4	ROTAMETER	1	FLOWTECH INSTRUMENTS SERVICES	APPROVED	
		2	EUREKA INDUSTRIAL EQUIPMENTS PVT.LTD.	APPROVED	
		3	FLOW STAR ENGINEERING PVT. LTD.,	APPROVED	
		4	INSTRUMENTATION ENGINEERS PVT LTD	APPROVED	
		5	SCIENTIFIC DEVICES (BOMBAY) PVT LTD,	APPROVED	
5	ANUBAR (DELTA TUBE)	1	SWITZER INSTRUMENT LTD.	APPROVED	
		2	STAR-MECH CONTROLS (I) PVT.LTD.	APPROVED	
		3	MICRO PRECISION PRODUCTS PVT. LTD.	APPROVED	
		4	TM TECNOMATIC SPA	APPROVED	
ELECTRICAL					
6	OIL FILLED SERVICE TRANSFORMERS	1	EMCO LIMITED	APPROVED	
		2	ESENNAR TRANSFORMERS (P) LTD.	APPROVED	
		3	KANO HAR ELECTRICALS LTD.	APPROVED	
		4	SCHNEIDER ELECTRIC INFRASTRUCTURE LIMITED	APPROVED	
		5	SOUTHERN POWER EQUIPMENT COMPANY PVT. LTD.	APPROVED	
		6	TRANSFORMERS and RECTIFIERS (INDIA) LTD.	APPROVED	
		7	TESLA TRANSFORMERS LTD.,	APPROVED	
		8	UNIVERSAL POWER TRANSFORMERS PVT. LTD.,	APPROVED	



S.No.	Package Name	S.NO	Vendor Name	Approval Status [Approved / Not Approved]	REMARKS, if any
		9	VOLTAMP TRANSFORMERS LTD.	APPROVED	
7	NEUTRAL GROUNDING RESISTOR	1	AMPCONTROL EQUIPMENTS PVT. LTD.	APPROVED	
		2	LACHHMAN ELECTRONICS	APPROVED	
		3	RESITECH ELECTRICALS PVT.LTD.	APPROVED	
		4	RSI SWITCHGEAR PVT. LTD.	APPROVED	
		5	S.R.NARKHEDE ENGG.PVT.LTD.	APPROVED	
8	ABOVE GROUND EARTHING MATERIAL	1	INDIA ELECTRICALS SYNDICATE	APPROVED	
		2	INDMARK FORMTECH PVT LTD	APPROVED	
		3	INDUSTRIAL PERFORATION (I) PVT.LTD.	APPROVED	
		4	PASSIVE INFRA PROJECTS PVT. LTD.	APPROVED	
		5	PATNY SYSTEMS (P) LTD	APPROVED	
		6	PREMIER POWER PRODUCTS (CAL) PVT. LTD.	APPROVED	
		7	RABI ENGINEERING WORKS PVT. LTD.	APPROVED	
		8	RAJASTHAN METAL SMELTING CO	APPROVED	
		9	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	APPROVED	
		10	RUKMANI ELECTRICAL & COMPONENTS PVT LTD	APPROVED	
		11	SARAL INDUSTRIES	APPROVED	
		12	UNITECH FABRICATORS and ENGINEERS PVT LTD	APPROVED	
9	DC LEAD ACID BATTERIES	1	EXIDE INDUSTRIES LTD	APPROVED	
		2	HBL POWER SYSTEMS LTD	APPROVED	
		3	HOPPECKE BATTERIEN GMBH & CO.KG,	APPROVED	
10	DC BATTERY CHARGER	1	AMARA RAJA POWER SYSTEMS LIMITED	APPROVED	
		2	CHHABI ELECTRICALS PVT.LTD.	APPROVED	
		3	CHLORIDE POWER SYSTEMS & SOLUTIONS LIMITED	APPROVED	
		4	DUBAS ENGG PVT LTD	APPROVED	
		5	HBL POWER SYSTEMS LTD	APPROVED	
		6	JEMA ENERGY	APPROVED	
		7	MASS-TECH CONTROLS PVT.LTD.	APPROVED	
		8	STATCON POWER CONTROLS LTD	APPROVED	
		1	APAR INDUSTRIES LIMITED,	APPROVED	
		2	CABLE CORPORATION OF INDIA LTD.	APPROVED	
		3	CRYSTAL CABLE INDUSTRIES LTD.	APPROVED	
		4	DIAMOND POWER INFRASTRUCTURE LTD	APPROVED	
		5	GEMSCAB INDUSTRIES LTD.	APPROVED	
		6	HAVELLS INDIA LIMITED	APPROVED	

S.No.	Package Name	S.NO	Vendor Name	Approval Status [Approved / Not Approved]	REMARKS, if any
11	HT XLPE CABLES	7	KEC INTERNATIONAL LIMITED	APPROVED	
		8	KEI INDUSTRIES LTD.	APPROVED	
		11	POLYCAB WIRES PVT. LTD.	APPROVED	
		12	RAVIN CABLES LIMITED	APPROVED	
		13	SRIRAM CABLES PVT. LTD.	APPROVED	
		14	STERLITE TECHNOLOGIES LTD	APPROVED	
		16	TORRENT CABLES LTD.	APPROVED	
		17	UNIVERSAL CABLES LTD.	APPROVED	
12	LT XLPE POWER CABLE	1	APAR INDUSTRIES LIMITED,	APPROVED	
		2	CORDS CABLE INDUSTRIES LTD.	APPROVED	
		3	CRYSTAL CABLE INDUSTRIES LTD.	APPROVED	
		4	DIAMOND POWER INFRASTRUCTURE LTD	APPROVED	
		5	GEMSCAB INDUSTRIES LTD.	APPROVED	
		6	GOVIND CABLE INDUSTRIES,	APPROVED	
		7	GUPTA POWER INFRASTRUCTURE LIMITED,	APPROVED	
		8	HAVELLS INDIA LTD.	APPROVED	
		9	KEC INTERNATIONAL LIMITED	APPROVED	
		10	KEI INDUSTRIES LTD.	APPROVED	
		11	MANSFIELD CABLES COMPANY LTD.	APPROVED	
		12	PARAMOUNT COMMUNICATIONS LTD.	APPROVED	
		13	POLYCAB WIRES PVT. LTD.	APPROVED	
		14	RAVIN CABLES LIMITED	APPROVED	
		15	SCOT INNOVATION WIRES AND CABLES PVT. LTD.	APPROVED	
		16	SPECIAL CABLES PVT. LTD.	APPROVED	
		17	SRIRAM CABLES PVT. LTD.	APPROVED	
		18	SUYOG ELECTRICALS LTD.	APPROVED	
		19	THERMO CABLES LTD.	APPROVED	
		20	TIRUPATI PLASTOMATICS PVT LTD	APPROVED	
		1	ADVANCE CABLE TECHNOLOGIES (P) LTD.	APPROVED	
		2	APAR INDUSTRIES LIMITED,	APPROVED	
		3	CMI LTD.	APPROVED	
		4	CORDS CABLE INDUSTRIES LTD.	APPROVED	
		5	CRYSTAL CABLE INDUSTRIES LTD.	APPROVED	
		6	DELTON CABLES LTD.	APPROVED	
		7	DIAMOND POWER INFRASTRUCTURE LTD	APPROVED	
		8	ELKAY TELELINKS LTD.	APPROVED	

S.No.	Package Name	S.NO	Vendor Name	Approval Status [Approved / Not Approved]	REMARKS, if any
13	LT PVC CONTROL CABLE	9	GEMSCAB INDUSTRIES LTD.	APPROVED	
		10	GOVIND CABLE INDUSTRIES	APPROVED	
		11	GUPTA POWER INFRASTRUCTURE LIMITED,	APPROVED	
		12	HAVELLS INDIA LIMITED	APPROVED	
		13	INCOM CABLES (P) LTD.,	APPROVED	
		14	KEC INTERNATIONAL LIMITED	APPROVED	
		15	KEI INDUSTRIES LTD.	APPROVED	
		16	MANSFIELD CABLES COMPANY LTD.	APPROVED	
		17	PARAMOUNT COMMUNICATIONS LTD.	APPROVED	
		18	POLYCAB WIRES PVT. LTD.	APPROVED	
		19	RAVIN CABLES LIMITED	APPROVED	
		20	SAM CABLES & CONDUCTORS (P) LTD.,	APPROVED	
		21	SCOT INNOVATION WIRES AND CABLES PVT. LTD.	APPROVED	
		22	SPECIAL CABLES PVT. LTD.	APPROVED	
		23	SPM POWER & TELECOM PVT. LTD,	APPROVED	
		24	SUYOG ELECTRICALS LTD.	APPROVED	
		25	SRIRAM CABLES PVT LTD	APPROVED	
		26	THERMO CABLES LTD.	APPROVED	
		27	TIRUPATI PLASTOMATICS PVT LTD	APPROVED	
		28	UNIVERSAL CABLES LTD.	APPROVED	
14	SCREENED CONTROL CABLES	1	CMI LTD.	APPROVED	
		2	CORDS CABLE INDUSTRIES LTD.	APPROVED	
		3	DELTON CABLES LTD.	APPROVED	
		4	ELKAY TELELINKS LTD.	APPROVED	
		5	KEI INDUSTRIES LTD.	APPROVED	
		6	PARAMOUNT COMMUNICATIONS LTD.	APPROVED	
		7	POLYCAB WIRES PVT. LTD.	APPROVED	
		8	T C COMMUNICATION PVT. LTD.	APPROVED	
		9	THERMO CABLES LTD.	APPROVED	
		1	EROS METAL WORKS (P) LTD.	APPROVED	
		2	INDIA ELECTRICALS SYNDICATE	APPROVED	
		3	INDIANA GRATINGS PVT. LTD.	APPROVED	
		4	INDMARK FORMTECH PVT LTD	APPROVED	
		5	INDUSTRIAL PERFORATION (I) PVT.LTD.	APPROVED	
		6	MAHESHWARI ELECTRICAL MFRS. PVT. LTD.	APPROVED	
		7	NAMDHARI INDUSTRIAL TRADERS PVT LTD	APPROVED	
		8	PARMAR METALS PVT.LTD.	APPROVED	

101 B&G

S.No.	Package Name	S.NO	Vendor Name	Approval Status [Approved / Not Approved]	REMARKS, if any
15	CABLE TRAYS & ACC.	9	PASSIVE INFRA PROJECTS PVT. LTD.	APPROVED	
		10	PATNY SYSTEMS (P) LTD	APPROVED	
		11	PENTAX FERRO INCORPORATE	APPROVED	
		12	PREMIER POWER PRODUCTS (CAL) PVT. LTD.	APPROVED	
		13	RABI ENGINEERING WORKS PVT. LTD.	APPROVED	
		14	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	APPROVED	
		15	RUKMANI ELECTRICAL & COMPONENTS PVT LTD	APPROVED	
		16	SARAL INDUSTRIES	APPROVED	
		17	UNITECH FABRICATORS and ENGINEERS PVT LTD	APPROVED	
		18	VINFAB ENGINEERS INDIA PVT LTD	APPROVED	
16	CABLE TRAY SUPPORT SYSTEM - WELDED TYPE	1	INDUSTRIAL PERFORATION (I) PVT.LTD.	APPROVED	
		2	INDMARK FORMTECH PVT LTD	APPROVED	
		3	PASSIVE INFRA PROJECTS PVT. LTD.	APPROVED	
		4	PATNY SYSTEMS (P) LTD	APPROVED	
		5	PREMIER POWER PRODUCTS (CAL) PVT. LTD.	APPROVED	
		6	RABI ENGINEERING WORKS PVT. LTD.	APPROVED	
		7	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.	APPROVED	
		8	RUKMANI ELECTRICAL & COMPONENTS PVT LTD	APPROVED	
		9	SARAL INDUSTRIES	APPROVED	
		10	UNITECH FABRICATORS and ENGINEERS PVT LTD	APPROVED	
17	TREFOIL CLAMPS	1	AJMERA INDUSTRIAL & ENGINEERING WORKS	APPROVED	
		2	ELECTROMAC INDUSTRIES	APPROVED	
		3	SUMIP COMPOSITES PVT.LTD.	APPROVED	
		4	MOULDED FIBREGLASS PRODUCTS	APPROVED	
18	CABLE TERMINATION & JOINTING KITS	1	HARI CONSOLIDATED PVT.LTD.,NEW DELHI	APPROVED	
		2	3M ELECTRO AND COMMUNICATION INDIA P. LTD	APPROVED	
		3	RAYCHEM RPG PRIVATE LIMITED	APPROVED	
		4	YAMUNA CABLE ACCESSORIES PVT LTD	APPROVED	
19	STATION LIGHTING SYSTEM	1	AVAIDS TECHNOVATORS PVT. LTD.	APPROVED	
		2	BAJAJ ELECTRICALS LTD.	APPROVED	
		3	MIKA ENGINEERS,	APPROVED	
		4	PHILIPS ELECTRONICS INDIA LTD	APPROVED	
		5	TECHNO ELECTRIC and ENGG. CO. LTD.	APPROVED	
		1	MULTI KILFIRE PVT LTD	APPROVED	

S.No.	Package Name	S.NO	Vendor Name	Approval Status [Approved / Not Approved]	REMARKS, if any
20	FIRE SEALING SYSTEM	2	VIJAY SYSTEMS ENGINEERS PVT LTD	APPROVED	
		3	SIGNUM FIRE PROTECTION (INDIA) PVT LTD	APPROVED	
		4	HILTI INDIA PRIVATE LIMITED	APPROVED	
		5	LLOYD INSULATIONS (INDIA) LIMITED	APPROVED	
		1	JINDAL STEEL AND POWER LTD	APPROVED	
21	MS ROD FOR BELOW GROUND EARTHING	2	RASHTRIYA ISPAT NIGAM LIMITED	APPROVED	
		3	STEEL AUTHORITY OF INDIA LTD.	APPROVED	
		1	APPLIED TECHNO PRODUCTS PVT. LTD.,	APPROVED	
22	ELECTRICAL LAB EQUIPMENT	2	HIOKI E.E. CORPORATION	APPROVED	
		3	JOST'S ENGG. CO. LTD.	APPROVED	
		4	PCI LIMITED	APPROVED	
		5	SCIENTIFIC MES-TECHNIK PVT.LTD.	APPROVED	
		6	TECHNOLOGY PRODUCTS	APPROVED	
		7	THE MOTWANE MANUFACTURING CO.PVT.LTD.	APPROVED	
		8	TTL TECHNOLOGIES PVT. LTD.	APPROVED	
23	GENERATOR CIRCUIT BREAKER	1	ABB SWITZERLAND LTD.,	APPROVED	
		2	ALSTOM GRID SAS	APPROVED	
24	PA SYSTEM	1	AISHAN TECHNOLOGIES INDIA PVT LTD	APPROVED	
		2	LARAON ENGINEERS AND CONSULTANTS PVT. LTD.	APPROVED	
		3	CHASHMITA ENGINEERS PVT. LTD.	APPROVED	
		4	BYTE COMMUNICATIONS PVT.LTD.	APPROVED	
		5	POWER SYSTEMS	APPROVED	
		6	HI-TECH AUDIO SYSTEMS PVT. LTD	APPROVED	
		7	INDUSTRONIC INDUSTRIE-ELECTRONIC GMBH & CO. KG	APPROVED	

PACKAGE: ELECTRICAL

Sl No	ITEM	Approved Supplier	Place
1	TRANSDUCERS	SOUTHERN TRANSDUCERS,	CHENNAI
		PYROTECH ELECTRONICS PVT LTD.,	
		RISHABH INSTRUMENTS PVT LTD.,	
		MASIBUS AUTOMATION AND INSTRUMENTS (P) LTD.,	
		INDO SWEDISH TRANSDUCERS	
		AUTOMATIC ELECTRIC LIMITED (AEL)	
		ELSTER METERING PVT LTD.,	MUMBAI
		MECO INSTRUMENT PRIVATE LIMITED	
2	ALARM ANNUNCIATORS	PROCON INSTRUMENTATION (P) LTD.,	
		ALAN INSTRUMENTATION PVT. LTD.,	
		JVS ELECTRONICS PVT. LTD.,	
		MINILEC INDIA PVT LTD.,	
		ACCORD ELECTRO-TECHNICS PVT. LTD.,	
3	CONTROL /SELECTOR SWITCHES	L & T (SALZER)	
		RELIABLE ELECTRONIC COMPONENTS PVT. LTD.,	
		SWITRON DEVICES	
		KAYCEE INDUSTRIES LIMITED	MUMBAI
4	DISCREPANCY SWITCH	ASEA BROWN BOVERI LIMITED	
		CONTROL DYNAMICS	
5	DISTURBANCE RECORDERS	ALSTOM T & D INDIA LIMITED	
		ASEA BROWN BOVERI LIMITED	
		QUALITROL HATHWAY	
6	ENERGY METER	SCHNEIDER ELECTRIC	
		SECURE METERS	
		SIEMENS LTD.,	
7	INDICATING METERS	SELEC CONTROLS PVT LTD.,	
		PYROTECH ELECTRONICS PVT LTD.,	
		MECO INSTRUMENTS PVT. LTD.,	
		RISHABH INSTRUMENTS PVT LTD.,	
8	NUMERICAL RELAY/ BAY CONTROL UNIT	ASEA BROWN BOVERI LTD.,	VADODARA
		ASEA BROWN BOVERI LTD.,	BENGALURU
		SCHNEIDER ELECTRIC INFRASTRUCTURE LIMITED	

PACKAGE: ELECTRICAL

8	NUMERICAL RELAY/ BAY CONTROL UNIT	ALSTOM	CHENNAI
		GE INDIA INDUSTRIAL PVT LTD.,	
		SIEMENS LTD.,	
		SCHWEITZER ENGINEERING LAB PVT LTD (SEL)	
9	OTHER SMALL ITEMS NOT COVERED ABOVE LIKE TERMINAL BLOCKS, WIRES AND LUGS ETC.,	BHEL REGISTERED REPUTED VENDORS.	
10	RECORDERS	EUROTHERM DEL INDIA LTD.,	
		CHINO CORPORATION INDIA PRIVATE LIMITED	
		ADEPT FLUIDYNE (P) LIMITED	
		YOKOGAWA INDIA LIMITED	
11	RELAY TEST KITS	OMICRON	USA
		MEGGER	UK
12	STATIC / ELECTROMECHANICAL PROTECTION / AUXILIARY / TRIPPING RELAYS FOR GPP	ALSTOM	CHENNAI
		ASEA BROWN BOVERI LIMITED	, VADODARA
		ASEA BROWN BOVERI LIMITED	, BANGALORE

PACKAGE: ELECTRICAL

1 No	ITEM	Approved Supplier	Place
1	(INDOOR) CT / PT UP TO 11 KV, ✓ CBCT, AUX. CT / PT (ICT) FOR GPP	PRAGATHI ELECTRICALS PVT. LIMITED SILKAANS ELECT. MFG. CO. PVT. LIMITED	
2	BUS TRANSFER SCHEME PANEL (NUMERICAL)	ABB LIMITED	VADODARA
3	EM RELAYS / AUXILIARY RELAYS	ASEA BROWN BOVERI LTD., SIEMENS ALSTOM T & D INDIA LIMITED ASEA BROWN BOVERI LTD.,	VADODARA MUMBAI BANGALORE
4	ENERGY METER	LARSEN & TURBO LIMITED (L & T) RISHABH INDUSTRIAL (L & T) SIEMENS LTD.,	
5	INSTRUMENTS	MECO INSTRUMENTS PVT LTD., SELEC CONTROLS PVT LTD., PYROTECH ELECTRONICS PVT LTD., AUTOMATIC ELECTRIC LTD., RISHABH	
6	MULTIFUNCTION METER	RISHABH SECURE METERS (SEMS) SIEMENS LTD.,	
7	NUMERICAL RELAY	ASEA BROWN BOVERI LIMITED ASEA BROWN BOVERI LIMITED ALSTOM T & D INDIA LTD SCHNEIDER ELECTRIC INFRASTRUCTURE LIMITED, (SEIL) SIEMENS LIMITED SCHWEITZER ENGINEERING LAB. PVT. LIMITED (SEL) GE INDIA INDUSTRIAL PRIVATE LIMITED	VADODARA BANGALORE
8	SURGE SUPPRESSORS (ZNO TYPE)	RAYCHEM	
9	SURGE SUPPRESSORS (ZNO TYPE)	ORLUM ELECTRICAL INDUSTRIES (P) LIMITED ELPRO	
10	VACUUM INTERRUPTER FOR 36 KV ✓ 25 KA, 12 KV 40 KA, 7.2 KV 44 KA, 25 KV 25 KA (PVTB)	BHARAT ELECTRONICS LTD	
11	VACUUM INTERRUPTER UP TO 12 ✓ KV & UP TO 26.3 KV	BHARAT ELECTRONICS LTD.,	

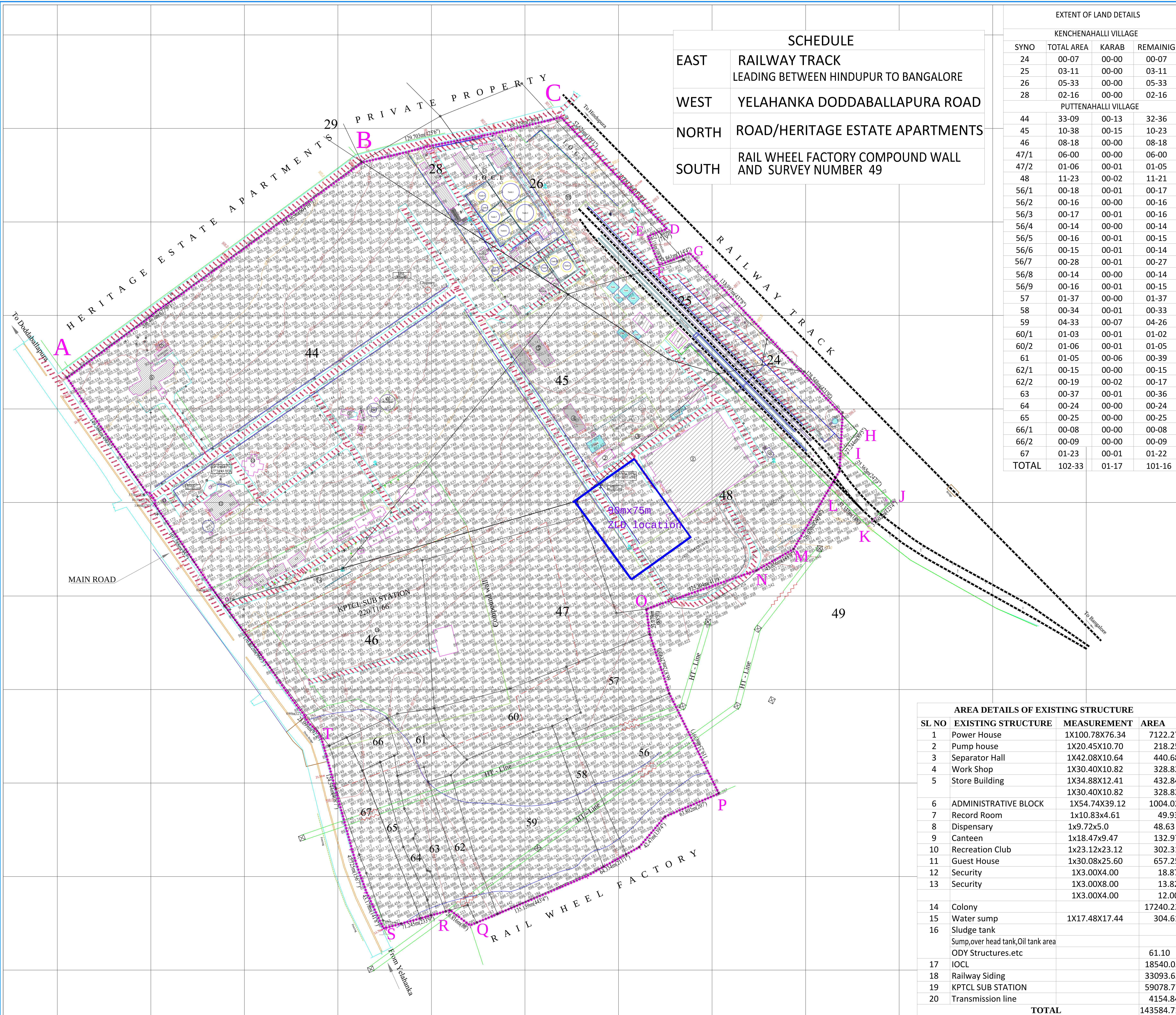
12 VACUUM INTERRUPTER, 12 KV 50, EATON CORPORATION ✓
KA, 36 KV 40 KA, 36 KV 31.5
KA, 25 KV 25 KA (PVTB)

SL.NO	Item	PREFERRED MAKES
1	PLC	ALLEN BRADLEY
		SCHNEIDER ELECTRIC INDIA PVT LTD
		HONEYWELL AUTOMATION
		GE- FANUC
		SIEMENS INDIA LTD
2	Analyzers	ABB LTD
		FORBES MARSHALL PVT LTD
		ROSEMOUNT ANALYTICAL LTD
		ENDRESS+HAUSER INDIA PVT LTD
		EMERSON PROCESS MANAGEMENT LTD
3	Level Gauge	LEVCON INSTRUMENTS PVT LTD,KOLKATA
		SBEM PRIVATE LIMITED,PUNE
		SIGMA INSTRUMENTS
		COMPANY,BHANDUP(WEST),MAHARASTRA.
		V.AUTOMAT & INSTRUMENTS PVT LTD,NEW DELHI.
		D.K.INSTRUMENTS PVT. LTD, KOLKATA
4	Level Switch	CHEMTROLS SAMIL (INDIA) PVT. LTD.,POWAI , MUMBAI
		LEVELSTATE SYSTEMS LTD
		SOLARTRON TRANSDUCER U.K
		RAMAN INSTRUMENTS PVT. LTD,MUMBAI (SYSTEM INTEGRATOR of SOLARTRON TRANSDUCER (U.K)
		HI-TECH SYSTEMS & SERVICES LTD,KOLKATA (SYSTEM INTEGRATOR OF LEVELSTATE SYSTEMS LTD
		LEVCON INSTRUMENTS PVT LTD,KOLKATA
		SBEM PRIVATE LIMITED,PUNE
		V.AUTOMAT & INSTRUMENTS PVT LTD,NEW DELHI.
		D.K.INSTRUMENTS PVT. LTD, KOLKATA
		LEVCON INSTRUMENTS PVT LTD,KOLKATA
		SBEM PRIVATE LIMITED,PUNE
		SIGMA INSTRUMENTS

		V.AUTOMAT & INSTRUMENTS PVT LTD,NEW DELHI.
		D.K.INSTRUMENTS PVT. LTD, KOLKATA
		CHEMTROLS SAMIL (INDIA) PVT. LTD.,POWAI , MUMBAI
		LEVCON INSTRUMENTS PVT LTD,KOLKATA
		SBEM PRIVATE LIMITED,PUNE
		SIGMA INSTRUMENTS COMPANY,BHANDUP(WEST),MAHARASTRA.
		V.AUTOMAT & INSTRUMENTS PVT LTD,NEW DELHI.
		D.K.INSTRUMENTS PVT. LTD, KOLKATA
		CHEMTROLS SAMIL (INDIA) PVT. LTD.,POWAI , MUMBAI
5	Pressure & Differential Pressure Gauges	A.N.INSTRUMENTS PVT LTD,CHENNAI
		GOA THERMOSTATIC INSTRUMENTS,GOA
		H.GURU INSTRUMENTS(SOUTH INDIA)PVT LTD,BANGALORE
		MANOMETER (INDIA) PVT. LTD,MUMBAI
		FORBES MARSHALL(HYD) LTD,HYDERABAD
		WALCHANDNAGAR INDUSTRIES LTD,DHARWAD,KARNATAKA.
		WIKA INSTRUMENTS INDIA PVT. LTD,PUNE
		BAUMER TECHNOLOGIES INDIA LTD,MUMBAI/VAPI
6	Pressure & Differential Pressure Switch	SWITZER PROCESS INSTRUMENTS PVT. LTD,CHENNAI.
		TRAFAG CONTROLS INDIA PVT. LTD,GURGOAN,HARYANA.
		BAUMER TECHNOLOGIES INDIA LTD,MUMBAI/VAPI
7	Electronic Transmitter - Pr. / Diff. Pr.	M/s ABB, GERMANY/ BANGALORE
		M/s EMERSON PROCESS , USA / NAVI MUMBAI (formerly FISHER ROSEMOUNT- USA)
		M/s HONEYWELL,USA/PUNE
		M/s YOKOGAWA, JAPAN / BANGALORE
		M/s ENDRESS + HAUSER(I) AUTOMATION,INDIA
		M/s SIEMENS LTD,INDIA
8	Level Transmitter	M/s ABB
		M/s Emerson Process Management
		M/s ENDRESS+HAUSER, GERMANY/INDIA
		M/s EMERSON PROCESS , USA / NAVI MUMBAI (formerly FISHER ROSEMOUNT- USA)
		M/s ENDRESS+HAUSER, GERMANY / INDIA
		M/s ABB, GERMANY/FARIDABAD
		M/s HONEYWELL,USA/INDIA

		M/s P&F,INDIA
		M/s MAGNETROL,BELGIUM
9	Temperature Elements	DETRIV INSTRUMENTATION AND ELECTRONICS LTD,MUMBAI.
		PYRO ELECTRIC INSTRUMENTS GOA PVT.LTD,GOA.
		TEMPSENS INSTRUMENTS (I) PVT LTD,UDAIPUR,RAJASTHAN.
		GAUGES BOURDON (INDIA) PVT. LTD,MUMBAI.
		INDUSTRIAL INSTRUMENTATION,KOLKATA
		EXOTHERM INSTRUMENTS ,MUMBAI.
		TOSHNIWALA INDUSTRIES PVT LTD,AJMEER,RAJASTHAN
		TECHNO INSTRUMENTS,GANDHINAGAR,GUJARAT.
		BAUMER TECHNOLOGIES INDIA LTD,MUMBAI/VAPI
		OKAZAKI MANUFACTURING COMPANY,JAPAN.
		GOA INSTRUMENTS INDUSTRIES PRIVATE LTD,GOA.
		THERMAL INSTRUMENT INDIA PVT. LTD,MUMBAI.
10	Temperature Gauges	A.N.INSTRUMENTS PVT LTD,CHENNAI
		GAUGES BOURDON (INDIA) PVT. LTD,MUMBAI.
		GOA THERMOSTATIC INSTRUMENTS,GOA
		H.GURU INSTRUMENTS(SOUTH INDIA)PVT,BANGALORE
		FORBES MARSHALL(HYD) LTD, HYDERABAD
		WIKI INSTRUMENTS INDIA PVT. LTD,PUNE
		GOA INSTRUMENTS INDUSTRIES PRIVATE LTD,GOA.
		THERMAL INSTRUMENT INDIA PVT. LTD,MUMBAI.
		BAUMER TECHNOLOGIES INDIA LTD,MUMBAI/VAPI
		M/s ADVANCE CABLES TECHNOLOGIES, BANGALORE
		M/S APAR INDUSTRIES, BANGALORE
		M/s SUYOG ELECTRICALS LTD. ALKAPURI, BARODA
		M/S GEMSCAB INDUSTRIES LTD, BHIWADI
		M/S KEC INTERNATIONAL LTD, BANGALORE
		M/S SPECIAL CABLES LTD, NEW DELHI
		M/S CORDS CABLES, RAJASTHAN
		M/S DELTON CABLES,FARIDABAD
		M/S GOYOLINE FIBRES ,MUMBAI
		M/S ELKAY TELELINKS LTD FARIDABAD, HARYANA

11	CABLES	M/S KEI INDUSTRIES LTD ,CHENNAI
		M/S T C COMMUNICATION PVT. LTD, NEW DELHI
		M/S MANSFIELD CABLES COMPANY LTD. NOIDA, U.P.
		M/S GUPTA POWER INFRASTRUCTURE LTD. BHUBANESWAR
		M/S PARAMOUNT CABLES,ALWAR
		M/S POLYCAB,DAMAN
		M/S THERMO CABLES, HYDERABAD
		M/S CMI Ltd, FARIDABAD
		M/S GOVIND CABLE INDUSTRIES, GHAZIABAD
		M/S TORRENT CABLES, NADIAD
		M/S SPM POWER & TELECOM PVT LTD, HYDERABAD
		M/S RAVIN CABLES, PUNE



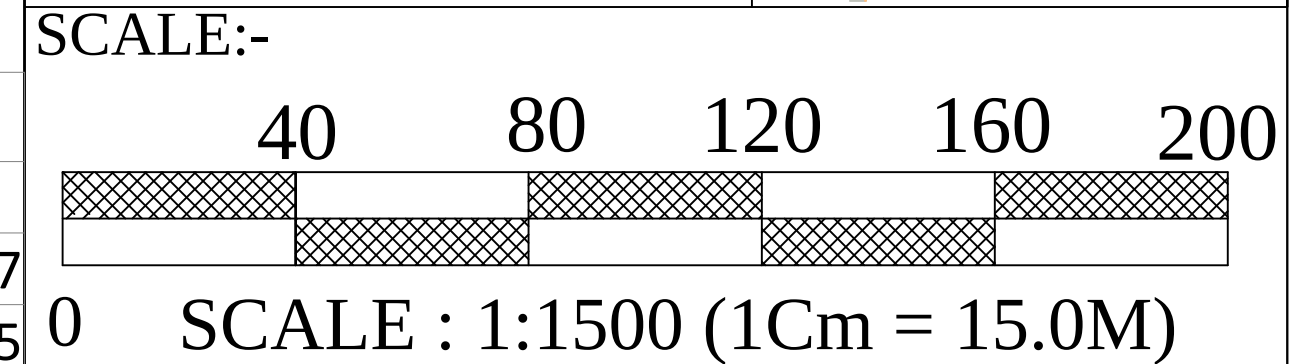
SCHEDULE	
EAST	RAILWAY TRACK LEADING BETWEEN HINDUPUR TO BANGALORE
WEST	YELAHANKA DODDABALLAPURA ROAD
NORTH	ROAD/HERITAGE ESTATE APARTMENTS
SOUTH	RAIL WHEEL FACTORY COMPOUND WALL AND SURVEY NUMBER 49

EXTENT OF LAND DETAILS			
KENCHENAHALLI VILLAGE			
SYNO	TOTAL AREA	KARAB	REMAINIG
24	00-07	00-00	00-07
25	03-11	00-00	03-11
26	05-33	00-00	05-33
28	02-16	00-00	02-16
PUTTENAHALLI VILLAGE			
44	33-09	00-13	32-36
45	10-38	00-15	10-23
46	08-18	00-00	08-18
47/1	06-00	00-00	06-00
47/2	01-06	00-01	01-05
48	11-23	00-02	11-21
56/1	00-18	00-01	00-17
56/2	00-16	00-00	00-16
56/3	00-17	00-01	00-16
56/4	00-14	00-00	00-14
56/5	00-16	00-01	00-15
56/6	00-15	00-01	00-14
56/7	00-28	00-01	00-27
56/8	00-14	00-00	00-14
56/9	00-16	00-01	00-15
57	01-37	00-00	01-37
58	00-34	00-01	00-33
59	04-33	00-07	04-26
60/1	01-03	00-01	01-02
60/2	01-06	00-01	01-05
61	01-05	00-06	00-39
62/1	00-15	00-00	00-15
62/2	00-19	00-02	00-17
63	00-37	00-01	00-36
64	00-24	00-00	00-24
65	00-25	00-00	00-25
66/1	00-08	00-00	00-08
66/2	00-09	00-00	00-09
67	01-23	00-01	01-22
TOTAL	102-33	01-17	101-16

POINTS		
A	13° 7'3.73"N	77°34'40.26"E
B	13° 7'8.75"N	77°34'52.18"E
C	13° 7'8.77"N	77°34'59.46"E
D	13° 7'4.17"N	77°35'2.27"E
E	13° 7'4.06"N	77°35'1.52"E
F	13° 7'3.07"N	77°35'1.68"E
G	13° 7'3.17"N	77°35'2.87"E
H	13° 6'55.84"N	77°35'7.23"E
I	13° 6'55.29"N	77°35'6.55"E
J	13° 6'53.20"N	77°35'7.85"E
K	13° 6'52.59"N	77°35'6.84"E
L	13° 6'54.41"N	77°35'5.66"E
M	13° 6'52.47"N	77°35'3.95"E
N	13° 6'52.02"N	77°35'2.52"E
O	13° 6'51.52"N	77°34'58.44"E
P	13° 6'44.74"N	77°34'59.46"E
Q	13° 6'42.10"N	77°34'49.95"E
R	13° 6'42.76"N	77°34'49.63"E
S	13° 6'42.67"N	77°34'47.07"E
T	13° 6'49.43"N	77°34'46.38"E

Notes:-
1.All Dimension & levels are in metres
2.A Bench mark has been established on the pillar in front of guest house and near power house as shown and assigning it to a +MSL 897.295 and 903.103 arbitrarily
3.Spot levels have been taken at 10m interval and 0.5m contours

Fence	---
Railway Stone,Boundary	---+---
Borewell,Electric pole	---+---
Teek ,Asphalt Road	---+---



TITLE:-
Topographical Survey of
DG PLANT PREMISES

AREA:-
Area =416114.55 Sqmt / 4479057.0 Sqft
Acres=102 Guntas=33

CLIENT:-
KARNATAKA POWER COOPERATION LIMITED
Puttenahalli, Bangalore,

CONSULTANTS:-

CIVIL CRAFT
SURVEY ENGINEERING AND MAPPING CONSULTANTS
#637,46th 'A' Cross,3rd Block,
Rajasingar, Bangalore-560 010
Ph:-080 23507176 Mob:-9591381871
Email:-civilcraft.ban@gmail.com

AREA DETAILS OF EXISTING STRUCTURE			
SL NO	EXISTING STRUCTURE	MEASUREMENT	AREA
1	Power House	1X100.78X76.34	7122.27
2	Pump house	1X20.45X10.70	218.25
3	Separator Hall	1X42.08X10.64	440.68
4	Work Shop	1X30.40X10.82	328.82
5	Store Building	1X34.88X12.41	432.84
		1X30.40X10.82	328.82
6	ADMINISTRATIVE BLOCK	1X54.74X39.12	1004.02
7	Record Room	1x10.83x4.61	49.93
8	Dispensary	1x9.72x5.0	48.63
9	Canteen	1x18.47x9.47	132.97
10	Recreation Club	1x23.12x23.12	302.31
11	Guest House	1x30.08x25.60	657.25
12	Security	1X3.00X4.00	18.87
13	Security	1X3.00X8.00	13.82
		1X3.00X4.00	12.00
14	Colony		17240.23
15	Water sump	1X17.48X17.44	304.61
16	Sludge tank		
	Sump,over head tank,Oil tank area		
	ODY Structures.etc		61.10
17	IOCL		18540.05
18	Railway Siding		33093.63
19	KPTCL SUB STATION		59078.77
20	Transmission line		4154.84
TOTAL			143584.71

1X370MW YELAHANKA COMBINED CYCLE POWER PLANT - ZERO LIQUID DISCHARGE PLANT					
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019					
PRE BID MEETING HELD ON 22.03.2019					
REPLIES TO PRE BID QUERIES					
SI No.	Cl. Ref.	Tender Description	Bidder's Query	Reply to Pre-Bid queries	Amended As
21	Cl refer - Section A2 Volume 1 Part I GCC Sheet 10/11, pg 14 of 158.	Tender Description - IMPLEMENTATION PERIOD: The implementation period is stipulated as 12 (Twelve) months	Bidders query - Please note, the implementation period of 12 months is very less considering the quantum of work involved. However we would like to have implementation period shall 18-19 months from LOA (Design, engineering, Supply, install, commissioning and PG test)	Completion period is 14 months. Refer revised Schedule of Milestone-F2 enclosed.	Completion period is 14 months from date of LOA. Refer Re-Revised Schedule of Milestone-F2.
27	Vol -I, PartI, GCC, page 38 of 158		Instruction to bidder Annexures, Bid evaluations Please clarify that if any chemical evaluation as part of bid evaluation to make bidder L1 basis.	Chemical evaluation is also a part of Bid Evaluation. Refer Schedule of Guaranteed Chemical Consumption - F14 enclosed.	Chemical evaluation is also a part of Bid Evaluation (Bidder shall indicate guaranteed quantities of chemicals required for full load operation). Refer Schedule of Guaranteed Chemical Consumption - F14 enclosed.
66	Vol III, Schedules, page 11 of 22		Bidder has to furnish UF & RO projections certified by the OEM with their offer. Power consumption in their projections shall only be indicated by the bidder against power consumption at duty point and same shall be considered for bid evaluation purpose Please clarify following: 1. Whether original equipment manufacturer (OEM) or membrane manufactured certified the RO and UF membrane projection. 2. RO high pressure pump power consumption evolution as per indicated in the RO projection calculation or As per feed water specified tender specification with risk shall be taken by EPC without affecting any KPI of the system.	Refer revised Schedule of Guaranteed Power consumption - F4 enclosed. 1. Membrane manufacturers projections from KPCL preferred makes (Dow, Hydranautics, Koch, GE, CSM, INGE/BASF, LG) for RO and UF membrane shall only be considered. 2. UF feed pump / RO high pressure pump power consumption shall be based on UF / RO projection calculation which inturn is based on feed water parameters specified tender specification. 3. Bidder has to supply the same membrane to KPCL after award of the contract for which projection certificate was furnished during bid evaluation. 4. Membrane projections and Total system shall be designed based on the TDS indicated in the Table-2. (CMB water analysis) and not based on ionic loads.	Refer revised Schedule of Guaranteed Power consumption - F4 enclosed. 1. Membrane manufacturers projections from KPCL preferred makes (Dow, Hydranautics, Koch, GE, CSM, INGE/BASF, LG) for RO and UF membrane shall only be considered. 2. UF feed pump / RO high pressure pump power consumption shall be based on UF / RO projection calculation which inturn is based on feed water parameters specified tender specification. 3. Bidder has to supply the same membrane to KPCL after award of the contract for which projection certificate was furnished during bid evaluation. 4. Membrane projections and Total system design shall be based on the TDS indicated in the Table-2. (CMB water analysis) and not based on ionic loads. 5. Zeroth to Fifth year projection for UF membrane and Zeroth to third year projection for RO membrane shall be submitted by bidder during bid submission. 6. The zeroth year projection of UF/RO shall be considered for bid evaluation. 7. For design of UF system 5th year projection shall be considered by the bidder. 8. For design of RO system 3rd year projection shall be considered by the bidder.
73	Volume-II Bid Drawing Documents pg 3 of 137	Schematic ZLD System KPCL/BID DRAWING/001	Also, Schematic Drawing provided shows Sludge Drying Bed after Centrifuge. Since, the tender mentions Sludge Dewatering system which includes Thickener and Centrifuge, Sludge Drying Beds can be considered as sludge storage yard for further disposal of Sludge. Kindly confirm. Please also provide SDB construction specifications from SPCB, if any, to avoid ground water pollution.	Sludge storage facility of 10m3 shall be provided apart from Sludge drying bed.	Sludge storage facility of 10m3 shall be provided apart from Sludge drying bed. The sludge drying bed shall be of 1 day capacity.

175		ZLD Schematic	Based on our experience the proposed scheme will not cater the performance guarantee requirement. Hence, we presume that bidder is free to decide the process scheme meeting the functional guarantee requirement. Similarly we also don't anticipate the requirement of Sludge Drying Bed. Please confirm.	Noted. Sludge drying bed of RCC construction is required.	Noted. Sludge drying bed of RCC construction is required. The sludge drying bed shall be of 1 day capacity.
213	Schedule - Operation and Maintenance Price Break-up-F15				Revised Operation and Maintenance Price Break-up-F15 is enclosed.
214	Civil construction (buildings)				The bidder can adopt either structural steel construction or RCC construction and roof shall be of RCC / Truss system.
215	All process / non-process buildings.				The bidder can adopt either Pre-engineered buildings steel construction or conventional steel construction conforming to relevant BIS codes.
216	Vol -I, PartI, GCC, pg 144 of 158	19.2.2 Limitation of Liability Under no circumstances that the Contractor's aggregate liability for: (a) Cumulative liquidated damages for delay (calculated as per clause no. 11.1.2 above), and/or (b) Cumulative Liquidated Damages for failure to achieve the Performance Guarantees (calculated as per clause no. 11.2.2 above), and/or (c) Cumulative Penalty for Additional power consumption over the guaranteed power consumption (calculated as per clause no. 11.2.2 above), shall not exceed 10% of the Contract Price.			19.2.2 Limitation of Liability Under no circumstances that the Contractor's aggregate liability for: (a) Cumulative liquidated damages for delay (calculated as per clause no. 11.1.2), and/or (b) Cumulative Liquidated Damages for failure to achieve the Performance Guarantees (calculated as per clause no. 11.2.2), shall exceed 10% of the Contract Price. Further, the penalty towards guaranteed power consumption and guaranteed chemical consumption shall be at actuals over and above the Liquidated Damages .
217		50% and 100% RO system definitions for incentive purpose.			Refer enclosure (Scope of work for 50% & 100% RO system).

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F2 VOLUME-III
Notification no : KPCL/2018-19/PS/WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 1 of 3

RE-REVISED SCHEDULE OF MILESTONES-F2

Milestone activities are as listed herein below:

SL.No.	Milestone activities
1	Completion of Effluent transfer pump system [from CMB to flash mixer & RO permeate tank (By-pass line)]
2	Completion of HRSCC system.
3	Completion of UF System (from PSF to UF water collection tank).
4	Completion of RO System (from RO feed pumps to RO permeate Storage tank and RO reject collection Tank).
5	Completion of ZLD Auxiliary systems (like De-aerator, Condenser, Distillate tank, Plate heat exchangers, Drawal of steam from the main Power plant etc.)
6	Completion of Evaporator cum Crystallizer System (like RO reject transfer pumps, Mechanical Vapour Compressor, Crystallizer, Re-circulation pump and Pusher type salt centrifuge etc.)
7	Completion of Extension of services from main power Plant (like Power supply, Fire hydrant system & Fire detection & alarm system, Instrument air, Potable water from the main plant network, Integration of the ZLD plant with the Main Power plant etc.)
8	Completion of other Auxiliary Systems. (like Air Conditioning, Ventilation, Material handling system, Illumination, Inter connecting Roads and other auxiliary systems required for the successful implementation of ZLD plant etc.)
9	Completion of HRSCC sludge handling system (like Sludge Sump and Sludge handling system, Centrifuge etc.)
10	Successful Completion of Performance guarantee test (for entire Zero Liquid Discharge Plant.)
NOTE:	Broad billing break-up and Detailed billing break-up (BBU) for Supply, Erection and commissioning and Civil works under the various heads indicated against Sl. No. 1 to 9 shall be furnished for customer approval before raising the invoice for payment.

NOTE:

- a) **Completion period is 14 months including monsoon** for the entire scope of work as specified elsewhere from the date of issue of LOA.

Bidder shall complete the commissioning of 50% RO capacity system (75m³/hr.) within 8 months from the date of LOA and 100% RO capacity system within 10 months and complete entire scope of work within 14 months.

However, KPCL desires that the bidder has to complete 50% RO capacity system in 6 months and 100% RO capacity system in 8 months.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION: F2 VOLUME-III
Notification no : KPCL/2018-19/PS/WORK_INDENT8374 Dtd: 27/02/2019		Sheet 2 of 3

- b) In the event of delay beyond completion period on account of reasons not attributable to the contractor, KPCL will review the progress and the completion period may be considered for shifting to the extent of the delays that are not attributable to the contractor.
- c) The Liquidated damages payable by the Contractor to the Owner for delay in Supply and Erection including achieving Performance acceptance after the Completion Date of the Plant (14 months) shall be at the rate of **Half (0.5) percent of total contract value per week** or part thereof of delay.

d) **Incentive for the early completion:**

50% RO capacity system: If the bidder successfully completes the commissioning of 50% RO capacity system in less than 8 months, he will be entitled for an incentive **@ 3.0% per month** of the Basic contract price (Basic lump sum price for supply, erection and civil works as per Schedule-F1) for early completion period. For part of the month incentive will be given **@ 0.1%** per day of early completion period.

100% RO capacity system: If the bidder successfully completes the Commissioning of 100% RO capacity system in less than 10 months, he will be entitled for an incentive **@ 3.0% per month** of the Basic contract price (Basic lump sum price for supply, erection and civil works as per Schedule-F1) for early completion period. For part of the month incentive will be given **@ 0.1%** per day of early completion period.

Limitation of incentive: The cumulative incentive shall not exceed 10% of the Basic Contract price (Basic lump sum price for supply, erection and civil works as per Schedule-F1).

e) **Limitation of Liability**

Under no circumstances that the Contractor's aggregate liability for:

- (a) Cumulative liquidated damages for delay

and/or

- (b) Cumulative Liquidated Damages for failure to achieve the Performance Guarantees

shall exceed **10%** of the Contract Price.

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT		SECTION: F2 VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES		Sheet 3 of 3

f) Penalty

Penalty towards guaranteed power consumption and guaranteed chemical consumption shall be at actuals over and above the Liquidated Damages.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY

DESIGNATION _____

COMPANY _____

DATE _____

	KARNATAKA POWER CORPORATION LIMITED YELAHANKA COMBINED CYCLE POWER PLANT (1X370MW) ZERO LIQUID DISCHARGE PLANT	SECTION:F15
		VOLUME-III
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019	SCHEDULES	Sheet 1 of 1

REVISED OPERATION & MAINTENANCE PRICE BREAK-UP-F15

(Bidder to fill-in and submit along with Bid)

Sl.No	Description	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1.	Lumpsum firm price for spares & consumables inclusive of GST.					
2.	Lumpsum firm price for Speciality chemicals inclusive of GST.					
3.	Lumpsum firm price for Man power inclusive of GST.					
4.	Lumpsum firm price for any other items inclusive of GST.					
5.	Lumpsum firm price for Operation & Maintenance of plant and equipment on 24x7 basis after taking over / issue of Notice To Proceed (NTP) inclusive of GST (Sum of 1+2+3+4).					
6.	Lumpsum firm price for Operation & Maintenance for a period of Five years inclusive of GST (Sum of 1 st , 2 nd , 3 rd , 4 th and 5 th year indicated under Sl. No. 5).					

Note:

1.0 The Lumpsum firm Price indicated under SL. No. 6 shall match with Price schedule-F1, Sl. No. 5.0 & 5.1. If there is any discrepancy between the Prices indicated in Price schedule-F1 and Operation & Maintenance Price Break-Up-F15, Lumpsum firm Price indicated in Price schedule-F1, Sl. No. 5.0 & 5.1 towards O&M Cost prevails.

SIGNATURE _____

NAME _____

SEAL OF THE COMPANY

DESIGNATION _____

COMPANY _____

DATE _____

Scope of work for 50% RO system and 100% RO system completion

Sl.No.	Scope of work	50% RO	100% RO
1	CMB water transfer pumps.	1W	1W+1S
2	PSF in bypass stream.	1W	1W+1S
3	Flash mixer tank.	1 No.	1 No.
4	HRSCC.	1 No.	1 No.
5	Pre-treatment chemical dosage system.	Complete system for 50% capacity.	Complete system for 100% capacity.
6	Sludge handling system including thickener,filter press / centrifuge, pumps,dosing systems and other accessories.	Complete system for 50% capacity.	Complete system for 100% capacity.
7	Clarified water storage tank.	1 No.	1No.
8	Filter feed pumps.	1W	1W+1S
9	Pressure sand filter.	1W	1W+1S
10	UF feed tank.	1 No.	1 No.
11	UF feed pumps.	1W	2W+1S
12	Back wash system.	Complete system for 50% capacity.	Complete system for 100% capacity.
a.	PSF back wash system with accessories.		
b.	UF back wash system with accessories.		
c.	Common back wash collection tank.		
d.	Back wash water transfer pumps.		
13	Self cleaning strainers.	1W	2W+1S
14	UF system trains.	1*50%	2*50%
15	UF permeate transfer pumps.	1W	1W+1S
16	RO feed tank.	1No.	1No.
17	Ro feed pump (for each stage).	1W	2W+1S
18	Cartridge filters for RO feed.(for each stage)	1W	2W+1S
19	RO HP Pumps.(for each stage)	1W	2W+1S
20	RO system trains.	1*50%	2*50%
21	Inter stage booster pumps (if applicable)	1W	2W+1S
22	RO-1 reject tank.	1No.	1No.
23	RO-2 reject tank.	1 No.	1 No.
24	CW make-up tank	1 No.	1 No.
25	CW make-up tank water transfer pumps	1W	1W+1S
26	Chemical dosing system for RO, CIP syatem,CIP tank,dosing pumps and other accessories.	Complete system for 50% capacity.	Complete system for 100% capacity.

NOTE: Components indicated against the 50% UF-RO and 100% UF- RO system shall be completed w.r.t pipings,mechanical,electrical,civil,instrumentation and controls and associated accessories in all respects for declaration of completion of work. However,the scope of work shall be freezed after LOA depending on system design offered by the successful bidder.

1X370MW YELAHANKA COMBINED CYCLE POWER PLANT - ZERO LIQUID DISCHARGE PLANT					
Notification no : KPCL/2018-19/PS /WORK_INDENT8374 Dtd: 27/02/2019					
PRE BID MEETING HELD ON 22.03.2019					
AMENDMENT TO PRE BID QUERIES - REPLY					
SI No.	Cl. Ref.	Tender Description	Bidders' Query	Reply to Pre-Bid queries	Amended As
42	Volume-1 Part-2 ..SCC pg 85 of 88	Page no 8/11 1.06.01- Supply of all chemicals and Consumables required for one year of operation of ZLD is in KPCL scope	Please confirm whether equipment spares like bearings of Motor/Pumps/UF/RO Skid ports shall be provided along with consumables like Grease/Belts/oil and chemicals.	All Bidders to quote for 5 years of O&M of ZLD plant. Spares, consumables, speciality chemicals is in the scope of the bidder. Whereas bulk chemicals and power supply is in the scope of KPCL.	All Bidders to quote for 5 years of O&M of ZLD plant. Spares, consumables, speciality chemicals is in the scope of the bidder. Whereas bulk chemicals and power supply is in the scope of KPCL. O&M shall be extendable for another Five (5) years on mutually agreed terms and conditions based on factors like Price indexes, Consumption pattern of Spares & Chemical, Man power requirement etc.