

GLOBAL TENDER NOTICE

For

60 TPD HCL Synthesis Unit

With

Steam Co-generation



THE TRAVANCORE-COCHIN CHEMICALS LIMITED

UDYOGAMANDAL.P.O.

KOCHI – 683 501

KERALA – INDIA

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THE TRAVANCORE - COCHIN CHEMICALS LIMITED
(A Government Company)
Udyogamandal P.O, Kochi-683501, Kerala

NOTICE INVITING TENDER (NIT)

TENDER REFERENCE NO: PROJ/60TPD HCL/2018(R1)

- i. Tenders are invited for the know-how, basic engineering, detail Engineering, supply, erection and commissioning using the latest state-of-the-art technology for a 60 TPD HCL Synthesis unit which can generate minimum 24 TPD saturated steam by replacing one of the existing 30 TPD HCL Synthesis Units in our Chlor-alkali Plant.

NB: Tenderers are advised to get acquainted with the building/space/ systems etc. of the existing HCl plant to ensure the feasibility of installing 60tpd HCl Synthesis unit with steam co generation in the designated space within the specified timeframe.

- ii. Dispatch of bid document : 04.07.2018
- iii. Cost of the bid document : Rs.1000.00 (non-refundable)
- iv. Earnest Money Deposit : Rs.2.00 Lakhs
- v. Closing date & time for receipt of bid: 18.07.2018, 14.00 hrs.
- vi. Opening of Techno-commercial bid: 19.07.2018, 15.00 hrs
- vii. Opening of Price Bid : On an appropriate date based on Technical evaluation
- viii. Cost of Tender: Rs.1000/- (non refundable) including applicable taxes by DD/online payment in favor of The Travancore-Cochin Chemicals Ltd; drawn on any Scheduled/Nationalized Bank payable at Ernakulum. Those who have downloaded the tender document from the website should submit the proof of online payment along with Part – I of the offer.

- ix. The bidders are requested to quote price with split figures such as;
- a) For the supply of imported items
 - b) For the supply of Indigenous items
 - c) For erection & commissioning including start-up, guarantee test run and training of TCC personnel on operation and maintenance.
- x. The interested parties shall submit the bids in two parts. Bidders are required to submit offer in Two covers, namely;

Part-I: Technical and Unpriced bids. ("Fee/Pre-Qual/Technical/")

Part-II: Priced bid (Financial).

- xi. Tender documents may also be downloaded from our website www.tcckerala.com, in that case the bidders should submit the cost of tender document by way of DD along with Part-1 of the Offer.
- xii. Earnest Money Deposit (EMD): Rs.2,00,000/- (Two lakhs) as DD or Bank guarantee from any Nationalized Bank or Foreign Bank having branches in India for an equivalent amount valid for 6 months from the last date for the submission of bids.
EMD shall not bear any interest and shall be released only after order finalization.
- xiii. Interested bidders may obtain further information about this requirement from the office of The Deputy General Manager (Projects), Travancore Cochin-Chemicals Ltd.
- xiv. Bidders shall ensure that, the bids complete in all respects, is submitted to the "Deputy General Manager (Projects)" The Travancore-Cochin Chemicals Limited, Udyogamandal P.O, Kochi- 683501, Kerala, India, or sent by registered post to reach to the Deputy General Manager (Projects), The Travancore-Cochin Chemicals Limited, on or before the closing "date and time" failing which the bids will be treated as late and will be rejected.
- xv. The Last date of receipt of duly filled up tenders 14.00 hrs on 18.07.2018.
- xvi. In the event of critical dates such as last date for tender submission, Tender opening date for part 1 & 2 being declared as a holiday /closed day for TCC, the bids will be received/opened on the next working day at the appropriate time. Price Bid Opening date shall be informed appropriately.

xvii. The bid enquiry documents are not transferrable.

All queries related to the tender shall be sent to the Office of the,

"Deputy General Manager (Projects)"

The Travancore-Cochin Chemicals Limited
Udyogamandal. P.O, Kochi – 683 501, KERALA,
INDIA, Tele-fax No.91-484-2545011
Email: projects@tcckerala.com

TENDER NOTICE

1. **INTRODUCTION**

The Travancore-Cochin Chemicals Ltd (TCC) is a Public Sector Undertaking established in the year 1951, having its registered office and factory at Eloor, Udyogamandal, Ernakulam District in the state of Kerala, India. The company is engaged in the manufacture and marketing of Caustic Soda Lye & Flakes, Liquid Chlorine, HCl acid, Sodium Hypochlorite and Sodium Chlorate.

TCC has a total caustic soda capacity of 175 TPD comprising of one Monopolar Membrane Technology plant of 125 TPD and 2 Nos. 25 TPD Bipolar Membrane Plants.

The company proposes to double the capacity by 2020.

TCC markets its products all over India to various consuming sectors. It has an annual turnover of IR 2500 Million. The company is managed by a team of qualified and experienced professionals and has total employee strength of 500.

The industrial relations are excellent and the company has a good record of safety. TCC is an ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007 certified company.

2. **BIDDER ELIGIBILITY CRITERIA**

Pre Qualification Criteria

The bidder must meet the following requirements to qualify for bidding:

- a. The bidder must be a technology supplier for similar plants or the Indian subsidiary of a foreign technology supplier having at least 50% equity, in the Indian subsidiary.
- b. The bidder must have supplied at least two numbers of HCl Synthesis units of 30 TPD or more capacity for the production of Hydrochloric Acid with 9-10 bar (g) steam cogeneration.
- c. The bids can be submitted either by the bidder meeting the above criteria singly or in consortium with a consortium partner.

In the case of consortium the leader shall have more than 50% share of the scope of supplies and services in terms of the price quoted by the consortium. The leader of the consortium shall be jointly and severally responsible with his consortium partner for the execution of the contract and performance of the plant in terms of the provisions of the contract.

The consortium should produce a consortium agreement between the members of the consortium, duly attested by a Notary Public of the place of execution of the consortium agreement, which shall contain the share of each of the consortium member and shall specifically mention the leader of the consortium and also clearly indicate that the consortium members shall be jointly and severally responsible for the execution of the contract and performance of the plant in the event the work is awarded to the consortium. The tender documents shall be signed by the leader of the consortium or any person duly authorized by the consortium by a power of attorney duly signed by the leader of the consortium and attested by a Notary Public of the place of execution of the power of attorney.

- d. The bidder must provide copies of 2 Purchase Orders / contract to show that they have supplied similar units stating the scope of work in brief, the year of commissioning. A copy of commissioning certificate & Performance Guarantee Test results for these supplies shall also be produced. In case the tenderer is refrained from disclosing the name and address of the beneficiary due to any Non Disclosure Agreement, the tenderer may mask Name and Address in the documents above however the documents are to be attested by the tenderer.
- e. The bidder must provide copy of at least one end user certificate regarding working of the Unit.
- f. The bidder must ensure themselves that they fulfill the eligibility criteria mentioned above before submitting the offer and shall submit documentary evidence to prove their eligibility.
- g. Bidders are advised to get acquainted with the available building, space and systems of the existing plant and a clear layout plan for all the equipments and shall schedule each activity connected with the erection & commissioning of the new unit.

Preparation of Bid.

The interested parties shall submit the bids in two parts.

Bidders are required to submit offer in Two covers, namely

Part-I-Technical and Unpriced bids. ("Fee/Pre-Qual/Technical/").

Part-II Priced bid. (Financial).

Those who have downloaded the tender document from the website should Submit the DD for Rs.1000/- towards the cost of tender document along with Part-I of the offer.

Offers shall be accompanied by,

- 1) EMD of Rs. 2.0 lakhs by way of DD/Bank Guarantee for equivalent amount valid for 6 months from the last date for submitting the tender.
- 2) Copy of receipt/DD of Rs.1000/- towards the cost of tender document.

Offers without the above are liable to be rejected.

Tender documents may be obtained from the office of the undersigned or can be down loaded from our web site www.tcckerala.com

Cost of Tender: Rs.1000/- by DD/online payment in favour of Travancore-Cochin Chemicals Ltd; payable at Ernakulum.

In the case of bidders down loading the tender documents from the web site the cost of tender document by way of DD shall be submitted along with Part- 1 of the Offer.

Earnest Money Deposit: Rs.200000.00 (Rupees two lakhs) as DD or Bank Guarantee from any Nationalized Indian Bank/Foreign bank having branches in India for an equivalent Amount.

Submission of the bids: Bidders shall ensure that the bids, complete in all respects, is to be submitted to the "Deputy General Manager (Projects), The Travancore-Cochin Chemicals Limited, Udyogamandal P.O, Kochi- 683501, Kerala India", by hand or sent by registered post to reach, on or before the closing date and time failing which the bids will be treated as late and will be rejected.

The Last date of receipt of duly filled up tenders, 14.00 hrs, 18.07.2018.

In the event of critical dates such as last date for tender submission, Tender opening date for part 1 & 2 being declared as a holiday /closed day for TCC, the bids will be received/opened on the next working day at the appropriate time in the office of the "**Deputy General Manager (Projects)**", **The Travancore-Cochin Chemicals Limited, Udyogamandal. P.O, Kochi – 683 501, Kerala, INDIA, Tele -No.91-484-2545011, Email:projects@tcckerala.com.**

3. PURPOSE & SCOPE OF TENDER

3.1 PURPOSE OF TENDER

This Notice Inviting Tender (NIT) is issued to receive firm quotations from reputed suppliers for replacing the existing 30 TPD HCL Synthesis Unit with a new **60 TPD HCL** Synthesis unit capable of generating **minimum 24 TPD** saturated steam based on the latest state-of-the-art technology.

The unit shall also be capable to produce HCl acid without steam generation.

3.2 SCOPE OF TENDER

3.2.1 Tender shall be for the know-how, basic engineering, detail engineering, supply, erection and commissioning of 60TPD HCL Synthesis Unit with steam Co-Generation based on the latest state-of-the-art technology by replacing existing 30 TPD unit.

3.2.2 All the works within the battery limit except dismantling of the existing unit is under the scope of this tender.

3.3. BATTERY LIMITS

The following battery limits shall be applicable for this Tender.

INCOMING (During Normal Operation)

- 1) Hydrogen : At the main isolation Valve in the existing Acid Plant with pressure of 1200mm water column at 40deg C
- 2) Chlorine: At the main isolation Valve in the existing Acid Plant with pressure of 1000mm water column at 40deg C, saturated with water vapor.

Cl ₂	:	95 % v/v
O ₂	:	1.8 % "
H ₂	:	0.5% "
Inert (CO ₂ , N ₂ etc.)	:	2.7 % "

- 3) Absorption water : At the ground floor level with a pressure of 2.0Kg/cm²g and 32°C
 Flow rate : 10 Nm³/Hr
 Conductivity : < 10 μ Siemens/cm
- 4) Boiler Feed water: from the soft water tank 2.0 M head in our existing boilerhouse.
 At the required Point with a pressure of 2000 mm of water column.
 Temperature 32°C
 pH 10-11
 Approximate flow rate 6M³/Hr
 Total Hardness (CaCO₃) < 5mg/l Total
 Alkalinity (CaCO₃) < 600mg/l Total
 Chlorides (CaCO₃) < 100mg/l PO₄
 < 100mg/l
- 5) Cooling water: Cooling water at 2.0Kg/cm²g and 35°C will be made available at the ground floor level.
- 6) Power: Power at specified ratings (415V/230V) for all the prime movers/instruments etc. will be made available.
- 7) Compressed air and instrument air: Instrument air at 4 – 6 Kg/cm²g and at a dew point of -7°C will be made available at a single air distribution header near to the equipment.
- 8) Nitrogen gas at 2.5 Kg/cm²g will be made available from Nitrogen Generation Unit at the ground floor.
- 9) Emergency Power: will be arranged by TCC. The tenderer shall give the total requirement of emergency power.

OUT GOING

- 1) 32% – Hydrochloric acid at and temp of 45°C at the inlet of HCL Storage vessel in the Acid plant.
- 2) Saturated Steam at a pressure of 10 bar (g) at the equipment steam outlet
- 3) Cooling water return – at a pressure of minimum 0.5 Kg/cm²g at 42°C maximum.
- 4) Effluent: All effluents to be directed and terminated at our Effluent streams. Vent gas from the Tail Gas Absorber (TGA) shall be directed to our dilute caustic scrubber unit.

Vent gas specifications

Flow rate	: 300 Nm ³ /Hr Max
Temperature	: 40°C
HCl content at TGA outlet	: 15mg/Nm ³
Cl ₂ content at TGA outlet	: 5 mg/Nm ³

Additional weightage is provided in the technical evaluation for the bidders ensuring better limits.

The new unit with ancillary systems is to be housed in the existing building without any major civil construction. If at all minor modification, like increasing the cut out size, providing additional support etc., will have to be done by the tenderer at their cost but not on the cost of *production* from existing unit. (Existing layout of HCL Plant attached)

During designing the following shall also be considered

1. Maximum heat recovery
2. Operational convenience
3. Adaptability in the existing building
4. Adequacy of the control/safety system to take care of unanticipated power outages.

3.4. Scope of work

The scope of work of the tender shall consist of the following;

- a) Supply of license, knowhow /technology
- b) Performing basic engineering & Detail Engineering which shall mainly include

Design of the HCl synthesis unit

Design basis and data sheet showing mass balance, utility consumption, environment emission specification and guaranteed figures.

Process sketch.

Operation and maintenance instructions. Process

description, manual of commissioning.

Operating procedures, maintenance, start-up and emergency shutdown instructions.

Assembly instructions and erection procedure;

Mechanical drawing of all supplied equipments.

Spare parts list, operation & maintenance manual of all rotating equipments with performance chart.

Construction parts lists of all supplied equipment for easy identification of each item according to item nos. in the drawings.

P&I diagram showing piping dimensions, piping materials, fittings and valves required for isolation and drainage, instruments (tag numbers according to customer specification) including equipment lists;

Process and control descriptions;

Interlock system with alarm and interlock list;

Wiring diagrams of ignition and control panels including input/output signals to main control panel, loop diagrams and panel views with dimensions;

Description of Instruments

Sub-supplier's documents for instruments supplied by them.

General arrangement drawing; with tie-in point information, drainage points;

Isometric drawings;

Piping list showing material, size, fluid and pressure rating; List of fittings

showing type, ratings, size, quantity and material; Sub-supplier's

documents for valves, flame arrestor etc

Final documentation: All engineering documents shall be compiled in a data book (both hard and soft copies required)

- c) Supply, erection and commissioning of **60 TPD HCL** Synthesis Unit including the integrated boiler to generate high pressure saturated steam at **10 bar(g)** with commissioning spares.
- d) Technical assistance comprising of;
 - i) Training of TCC personnel in assembling, operation and maintenance of plant.
 - ii) Operational assistance for plant start-up.
- e) The tenderer shall specify elaborately the documents, design details, detailed drawings, data sheets of equipment, instrumentation, civil works, operating and maintenance manuals of the areas covered by their scope of supply.
- f) Engineering package should include all systems and facilities up to the battery limit.

- g) The codes and standards followed shall be ;
 - a) For piping ASME / ANSI
 - b) Flange and connections DIN or ASME/ANSI
 - c) Steam system should be conforming to IBR standards
- h) HAZOP / Safety studies and reports thereon.
- i) The tenderer shall satisfy themselves with the adequacy and satisfactory condition of the existing facilities to be integrated to the new plant and the successful tenderer shall not be absolved of his obligations in terms of warranties and performance guarantees on account of any failure of the existing facilities.
- j) The tenderer shall make a detailed study of the proposed site for better understanding of the available building space and equipments in the existing plant and has to propose a detailed scheme. This shall include scheme for replacement / modification of equipments/vessels piping etc.
- k) The associated boiler unit shall conform to IBR standards. The initial license, certification to operate at the designed level and capacity for a period of one year from the date of commissioning shall also be provided.
- l) To grant TCC irrevocable non-exclusive rights to establish and operate the Unit and produce and sell the products in India or any other country.
- m) To provide complete list of items of machinery and equipment required for the plant with full technical specifications, data sheets, dimensional drawings, break up prices on CIF Cochin Port basis for imported items and FOR TCC warehouse for indigenous items.
- n) To offer a comprehensive test to establish the performance of proposed manufacturing facilities covered in the scope of work.

3.5 Technical Specifications

HCl synthesis unit with burner and steel combustion chamber, consisting of:

Burner

The burner system shall be with automatic ignition and designed to ensure complete combustion of feed gases. The system shall be easily accessible for assembly and removable for maintenance

The burner system shall be equipped with suitable Burner Management System (BMS) which can ensure safe operation. Details of BMS are detailed under instrumentation scope of supply.

Boiler

The integrated boiler for cogeneration of steam shall be made of high quality steel capable of withstanding the temperature and developed pressure.

All statutory and other approvals and certifications including IBR required for the erecting, commissioning and operation are to be complied.

HCl synthesis furnace designed as steel combustion chamber for *10 bar g steam* production;

Rupture Disc

For the safety of the unit detachable/replaceable rupture discs shall be provided wherever necessary.

Suitable falling film absorber & vent gas scrubber shall be considered.

FIELD INSTRUMENTATION

Shall have the following as minimum:

All transmitters shall be loop powered (24 VDC) with 4-20 milli amps output and with HART compatibility.

All positioners in control valves shall be electro pneumatic type.

Process Control:

Measurement of density consisting of sensor, transmitter; measuring range 0-38 wt. % HCl.

Flow control equipment for Cl₂ and H₂, orifices, transmitters, control valves with mounted solenoid valves.

Flow control equipment of absorption water, air for ignition, orifice, transmitter, control valve included;

Local pressure gauges for N₂ and cooling water etc Temperature

gauges for cooling water inlet and outlet etc

Temperature transmitter with alarm of acid from scrubber and other points

Pneumatically actuated on/off valves mounted with solenoid valves for Cl₂ and H₂ gas etc.

Restriction orifice and pneumatically actuated on/off valve with mounted solenoid valve for N₂ purge etc

Automatic Start-up:

Pilot ignition burner (BX), including electrodes made of ceramic, tantalum and graphite, PTFE adapter, hoses for air/H₂, high voltage cables;

Local pressure gauge (PI) for air, hydrogen etc;

Restriction orifices and pneumatically actuated on/off valves (RO/XV) with mounted solenoid valves for H₂ and air to pilot burner;

RO/XV with mounted solenoid valves for start-up via H₂ and Cl₂ bypasses.

Safety Interlock:

Flow measurement for cooling water with low alarm;

Flow meter for N₂ purge with contact output, low alarm Pressure gauges with contacts for Cl₂ and H₂, low alarm; Monitoring of the rupture disc with relay output;

Infrared photocell system with transmitter;

Ultra-violet photocell system with transmitter;

Product Acid Pumps:

Local pressure gauges;

Local temperatures gauges;

Instrumentation for Steam System:

Level measurement control for steam boiler Level high alarm; Level low, alarm; Local liquid level;

Pressure gauge for steam boiler;

Pressure transmitter for steam boiler, high alarm included; Pressure gauge for boiler feed water;

Flow measurement for boiler feed water;

Conductivity measurement and control valve for automatic purge.

INSTRUMENTATION – IGNITION PANEL

Ignition Panel for ignition and automatic start-up for installation close to the unit consisting of:

Local panel (IP65) made of preferably plastic;

Infrared and ultra-violet photocell amplifier, spark transformer, spark detector;

Signal lamps and push-buttons for automatic start-up;

Terminals for signals and alarms,

Power: 230 V AC; 50Hz (only if not powered by control panel)

INSTRUMENTATION – CONTROL PANEL

Panel containing completely wired Safety System including Hardware for start- up/shut-down sequences, ignition and interlock functions, consisting of:

Panel (IP54) made of MO CFRP to be located in a shielded environment (e.g. the control room, Ex free) at max. 150m away from the synthesis unit;

Licensed Software, sequence programming and digital I/O signal for alarms and trips, transferable to DCS;

Terminals for signals and alarms, for others power distribution with circuit breaker.

Power: 230 V AC; 50Hz

FITTINGS AND FLAME ARRESTORS

Valves for isolating, drainage and venting, including gaskets, nuts and bolts;

Sight glass for acid product and condensate pipe;

BURNER MANAGEMENT SYSTEM (BMS)

BMS shall be a standalone one incorporating all safety requirements specified in the technical specifications above. The BMS shall be capable to communicate with the DCS.

ONLINE CONTINUOUS EMISSION MONITORING SYSTEM (CEMS)

The above system shall continuously monitor the HCl gas and chlorine gas in the vent gas line and shall transmit the same to the DCS as well as to CPCB server. The system shall be designed to meet the CPCB guidelines and requirements with regard to the emission of HCl synthesis unit.

4. PROCEDURE FOR EVALUATING THE BIDS.

The tender committee will evaluate and compare the pre-qualified tenders in two stages viz., technical evaluation and commercial evaluation. The final comparison will be done by arriving at a comparison price based on technical superiority, derived benefits in future and quoted price.

The Evaluation method is as below.

TECHNICAL (100 Points)

Technical aspects are evaluated considering Technology & Process, Single Responsibility, After Sales Service and Assured Emission Limits, as specified below :-

(i)	Technology & Process	-	10
(ii)	Single point responsibility	-	5
(iii)	No. of similar plants	-	5
(iv)	Inbuilt Proven Online monitoring system-		5
(v)	Ease of operation/Maintenance	-	10
(vi)	Adaptability of the unit in the existing space-		10
(vii)	Delivery period & commissioning of plant-		5
(viii)	Performance Guarantee exceeding 24 Months-		10
(ix)	Assured after sales service	-	10
(x)	Emission limits		20
	HCL	10	
	Chlorine	10	-
(xi)	Level Of Automation	-	10
	Total	-	100

Only the bid scoring 70% and above will be considered for the price comparison.

COMMERCIAL

The commercial evaluation shall be done based on the net overall outcome of the investment for the estimated life span of 5 years.

a) **Effective Price (EP)** is taken as the quoted price minus (-) net present value of life benefits by way of high pressure steam generation for a period of 5 years over and above 24 TPD with 10% discounting rate.

Bid comparison price is arrived based on the following formula;

Bid Comparison price = Effective Price / Technical point obtained in the technical evaluation.

Bidder with the **Minimum Comparison Price** shall be considered for the project.

5 . THE SITE CONDITIONS

Soil condition	:	Laterite soil, max. load bearing capacity – 15MT/M ²
Rainfall	:	Normal, Annual Rainfall – 3350mm in two Spells; June-August & October-November.
Maximum rainfall	:	1320mm (normally in June) in a month. Wind
velocity	:	10-12 Km/hr
Relative humidity	:	75% -93%.
Ambient Temp	:	25 -36°C

These conditions are only representative and the tenderers should make their own enquiries and ascertain the conditions.

6. TECHNICAL COMPLIANCES

The tenderer shall furnish the following details:-

- a) Experience in supply of similar plants both in India and abroad.
- b) Market share in terms of number of units and capacity (TPD).
- d) Operating details
- e) Safety features incorporated in the design for safe operation of the plant.
- f) Maintenance frequency and type of maintenance and estimated cost usually involved.
- g) Ensured emission norms

The tenderer shall provide the complete details of the control and interlock philosophy of the proposed requirements in DCS for the plant and for inter- phasing with the existing system.

Burner Management System shall be a standalone one incorporating all safety requirements specified in the technical specifications above.

7.0. COMMERCIAL OFFER

Commercial offer should contain break up price for transfer of knowhow, basic engineering, detailed engineering, supply, erection and commissioning of the unit.

The currency conversion rate shall be the prevailing rate at the time of effecting payment for different heads as mentioned in the contract.

The currency conversion rate for price/commercial comparison shall be the tender opening date.

The quotation should have the **list of spares along with cost separately for first 3 years of operation of the plant** for imported items and one year for indigenous items. The price quoted shall be binding for 36 Months.

Tenderer should try to maximize use of indigenous machinery, materials and workmanship.

Tenderer shall give details on the other proposed service deemed necessary, like procurement, inspection etc., and the services offered shall be specifically mentioned in the quotation.

The technical bid and price bid should be submitted separately.

8.0. Validity of the offer:

The offered rates are to be valid for **90 days** from the date of opening the tender.

9.0. GUARANTEES & WARRANTIES

TCC Guarantee Requirements

Sl.No	Details		Qty/Value	Unit
1.	HCl production (100%)		60 Min.	TPD
2.	HCl product concentration		32Min.	%
3.	HCl product free chlorine		50Max.	ppm
4.	HCl product temperature		45Max.	Deg. C
5.	Steam Pressure		9.0Min.	Bar (g)
6.	Qty of saturated steam		24Min.	TPD
7.	Emission parameters	Chlorine	5Max.	mg/Nm ³
		HCl	15Max.	mg/Nm ³

Bidder may improve upon the above and offer their guaranteed values against each of the above requirement.

Equipment warranty

Tenderer shall guarantee that the equipment supplied is new and without any defect and manufactured of first class quality material and workmanship. This warranty should be valid for a period of **24 months** from the date of successful commissioning of the plant. In case of failure before expiry of warranty period, tenderer shall replace the same free of cost immediately.

Performance Guarantee

Plant performance is to be proved as per performance guarantee furnished by the tenderer for a continuous period of 72 hours with respect to plant capacity; plant flexibility, materials and utilities consumption figures, product quality etc.

Guarantee Test Runs (GTR)

To be conducted after the plant is operated continuously for 7 days at an average load of 80% or on achieving full rated capacity continuously for two days after the date of Start-up, whichever is earlier. Guarantee runs should be completed within six months from the date of completion of erection of the plant. During Guarantee run no stand-by equipment shall be used in parallel for proving their guarantee.

Successful completion of guarantee test shall not relieve the tenderer of their obligation and responsibility in any manner with regard to modification/rectification/replacement to meet warranty.

The tenderer should guarantee the individual and overall milestones as per PERT chart from the date of award of contract, which include preparation of drawing and their approval, procurement, fabrication erection of equipment at site etc. A detailed PERT/CPM network is to be submitted for vigorous follow-up and timely completion.

During the guarantee test run, if the plant fails to meet the guarantee figures given, the tenderer shall modify the plant and systems at his risk and cost to achieve the guarantee within the agreed stipulated time. The liability of the bidder in such an event shall be unlimited and TCC is free to penalize the tenderer for his failure to meet the obligation.

If GTR figures varies the guarantee from the guaranteed limits, the tenderer should modify/rectify/replace the system or equipments and should bring the figures within the guarantee figures.

10. DRAFT CONTRACT

The draft contract annexed forms a part of this tender document and vice versa.

11. LIQUIDATED DAMAGES, PAYMENT TERMS, COMMERCIAL TERMS etc

As provided in the draft Contract.

12. INSPECTION

As provided in Chapter – 7 of the draft Contract.

13. DELIVERY AND ERECTION OF THE EQUIPMENT

TCC prefer to complete the supply, erection & commissioning of the plant within 15 months from the Effective Date of Contract. The tenderer shall provide supply, erection & commissioning schedule along with the offer. Expedited delivery carries value points (ref. Sec.4.1)

14. TECHNICAL OFFER REQUIREMENTS

Full Technical Specification of the Contract Equipment Quantity and Quality of the Products

Technical Compliance / deviation from the requirements specified in the tender document

Assured Emission Limits

Erection & Commissioning Schedule Bidder

Eligibility Documents

EMD: Demand Draft or Bank Guarantee Cost of

Tender Form: Demand Draft

DRAFT CONTRACT

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DRAFT AGREEMENT TO BE EXECUTED BY SUCCESSFUL TENDERER

THIS CONTRACT (hereinafter referred to as "CONTRACT") made and entered into thisdayof.....TwoThousand eighteen by and between:

THE TRAVANCORE – COCHIN CHEMICALS LIMITED a Company registered under the Indian Companies Act, 1913, having its Registered Office at Udyogamandal. P.O, Kochi – 683 501, Kerala, India, (hereinafter referred to as "TCC") on the one part

AND

..... a Company organized and existing under the laws of and having its principal place of business at (herein after referred as "CONTRACTOR") on the other part

WITNESSETH

WHEREAS, TCC desires to purchase and use 60 TPD Hydrochloric Acid Synthesis Unit withTPD saturated steam of 10 bar (g)

AND WHEREAS, CONTRACTOR is willing to supply, erect and commission the said 60 TPD Hydrochloric Acid Synthesis Unit with ...TPD saturated steam of 10 bar (g) with specifications acceptable to TCC under the terms and conditions as hereinafter set forth.

NOW THEREFORE, in consideration of the promises and the mutual covenants contained herein, the parties hereto have agreed to as follows:

CHAPTER -1

DEFINITIONS

The words and terms set forth below, unless otherwise expressly stated herein, wherever used in this Contract, shall have the following meanings:

- 1.1 "CONTRACT EQUIPMENT" 60 TPD Hydrochloric Acid Synthesis Unit which is capable of generatingTPD saturated steam of 10 bar (g) at TCC's site at Udyogamandal.
- 1.2 "EFFECTIVE DATE" means the date upon which CONTRACT takes effect as provided for in Chapter 19.
- 1.3 "EQUIPMENT" means all of the proprietary and non-proprietary equipment, materials and others including spare parts to be supplied by CONTRACTOR for CONTRACT EQUIPMENT as specified in Chapter- 2 hereof.
- 1.4 "CONTRACT PRICE" means the contract amount defined in Chapter-3.
- 1.5 "BATTERY LIMITS" means the limits up to which the Contractor's supplies/services are envisaged, as provided in Chapter-9.
- 1.6 "PATENT" means any and all patents and/or patent applications in India and all other countries, including all patents to be matured on such patent applications relating to Caustic Soda Plant and CONTRACTOR agree to supply as per this CONTRACT.
- 1.7 "START UP DATE" means the date on which HCL is produced & Steam at requisite pressure is generated from the CONTRACT EQUIPEMENT and which shall be confirmed in writing by both parties.
- 1.8 "ACCEPTANCE" means the date on which the performance test of the unit is successfully completed and the written acceptance of the unit is given by TC

Note-1: The design conditions and technical data including product specifications, etc.(as included in the Tender).

CHAPTER - 2

CONTRACTOR'S SCOPE OF SUPPLY

- 2.1 The proposal involves establishing of “provide know-how, basic & detail engineering service.
- 2.2 Supply of contract equipment.
- 2.3 Erection/assembly of unit and start-up, commissioning, guarantee test run of the contract unit.
- 2.4 Commissioning including guarantee test run
- 2.5 Training of TCC personnel.
- 2.6 Supply of imported items for the equipment.
- 2.7 Supply of any Indigenous items for the equipment.
- 2.8 Supply of commissioning spares for the unit.

CHAPTER - 3

CONTRACT PRICE

3.1 Amount of CONTRACT PRICE: CONTRACT PRICE to be paid by TCC to CONTRACTOR for the scopes specified in Chapter-2 is as follows:-

3.1.1 For basic & detailed engineering

3.1.2 For supply of imported items:

3.1.3 For indigenous items:

3.1.4 Erection, commissioning including start-up, guarantee test run and training of TCC personnel.

- Note:
1. While making your offer the total cost may be given with split figures for invoicing purposes.
 2. All applicable taxes shall be indicated separately.

CHAPTER - 4
PAYMENT TERMS

- 4.1 Basic Engineering and detail engineering
- (i) 20% of the bill amount will be paid as advance against contractor's invoice within 30 days of signing contract upon producing a bank guarantee (from any Nationalized Indian Bank for equal amount valid for 24 months.
 - (ii) Balance 60% pro-rata basis upon mutually agreed weight age / milestones.
 - (iii) Balance 20% upon completion and acceptance of the plant and on producing the Performance Bank Guarantee for an equal amount (from any Nationalized Indian Bank valid for 24 months from the date of acceptance of the plant.
- 4.1.1 Any tax payable in India towards Import of Technology pursuant to this contract and to be withheld by TCC at source and paid to the department shall be borne by the contractor.
- 4.2 For supply of equipments (3.1.2 & 3.1.3)
- i) For supply of equipments 20% advance against bank guarantee of equal amount valid for 24 months.
 - ii) Balance 60% - pro-rata payment against producing invoice/shipping documents and balance.
 - iii) 20% on production of Bank Guarantee for equal amount valid up to 24 months (from any Nationalized Indian Bank) from the date of acceptance of the plant.
- 4.3 For erection, commissioning including start-up, guarantee test run and training of TCC personnel.

- i) Advance 20% of the price against producing bank guarantee of equal amount valid up to the mechanical completion.
- ii) 60% payment on pro-rata basis on progress of work based on mutually agreed weightages / milestones.
- iii) Balance 20% on completion of the training of TCC personnel and acceptance of the plant on production of bank guarantee for an equal amount valid up to 18 months from the date of acceptance of the plant from any Nationalized Indian bank / other taxes /ESI & PF deduction.

4.4 Income Tax deductions/other taxes/ ESI & PF deductions;

Any income tax/ other payables in respect of such payment will be to the account of contractor and TCC shall be entitled to deduct such tax at source and pay the same to the department. All the applicable state and central government taxes, including GST, any other duties, cess or statutory levies levied by central or state authorities will be to the account of the contractor and TCC shall be entitled to deduct such taxes and pay the same to the department.

- 4.4.1 As evidence of such tax payments, TCC shall obtain certificate of such payment from competent tax authorities and transmit the same to Contractor. Income tax to be paid in India by any Contractor pursuant to execution of contract and to be withheld by TCC at source shall be borne by the Contractor.

The Contractor shall furnish all information for the purpose of determining the taxability in respect of such payments.

CHAPTER - 5

CHANGES

- 5.1 TCC reserves the right, during the course of engineering meetings to make changes in and/or additions to the specifications of equipment. No change order shall become binding unless it is confirmed in writing by the parties hereto.
- 5.2 If such changes and/or additions cause an increase or decrease in obligations of CONTRACTOR under CONTRACT, or affect the delivery schedule of EQUIPMENT, an equitable and reasonable adjustment of CONTRACT PRICE and/or the delivery schedule shall be made on mutual agreement basis.

CHAPTER - 6
SHIPPING TERMS

6.1 Imported Equipment

6.1.1 Contractor shall deliver EQUIPMENT to TCC on cost, Insurance and Freight (CIF) Cochin port basis as per INCOTERMS 2000. Marine and other transit insurance for the equipments from the warehouse of TCC in Udyogamandal, Kerala, India will be under the scope of the contractor.

6.1.2 Packing of equipment shall be of manufacturer's standard, which shall be appropriate for seaworthy export transportation. Any damage arising from faulty or improper packaging will be the responsibility of the contractor along with any delays associated with such damages.

6.1.3 Date of Delivery

The date on board of Bill of Lading shall be deemed to be the date of delivery of equipment.

6.1.4 Shipping Advice

Contractor shall give TCC or its nominated agent the shipping advice in writing immediately after shipment.

6.2 Indigenous equipment

6.2.1 The contractor shall deliver the equipment on TCC warehouse basis. Transit insurance shall cover the equipment up to warehouse in the premises of TCC in Udyogamandal, Kerala.

6.2.2 Packing of the equipment shall be of manufacturer's standard

6.2.3 The date on which the equipment reaches TCC warehouse shall be deemed to the date of delivery of equipment in case of indigenous equipments.

CHAPTER - 7
TEST & INSPECTION

- 7.1 TCC may send its representative to Contractor's plant and/or vendor's plant at TCC's expense to inspect or witness the test of equipment. CONTRACTOR shall notify TCC the date and place at least two (2) weeks prior to the date on which test or inspection is to be made. Such inspection or witnessing of the test of equipment by the representatives of TCC shall not in any way affect the liabilities of Contractor towards the quality standards and specifications of the equipment.
- 7.2 Records and/or certificates of test and/or inspection shall be submitted to TCC by Contractor regardless of whether TCC's representative attend or do not attend such test and/or inspection.
- 7.3 TCC may arrange third party inspection at TCC's expense to inspect or witness the test of equipment or can waive the inspection

CHAPTER - 8
DELIVERY SCHEDULE

CONTRACTOR shall deliver CONTRACT EQUIPMENT to TCC within months of effective date of contract and will commission the same within months from the date of completion of plant erection.

Note:Detailed Schedule to be provided.

CHAPTER – 9

TCC'S SCOPE OF SUPPLY AND BATTERY LIMITS

- 9.1 All equipment, materials and engineering works outside battery limits shall be supplied and made available by TCC.
- 9.2 Equipment and materials that forms part of the CONTRACT EQUIPMENT shall be supplied / provided by CONTRACTOR.

9.3 BATTERY LIMITS

The following battery limits shall be applicable for this Tender.

9.3.1 INCOMING (During Normal Operation)

- 1) Hydrogen : At the main isolation Valve in the existing Acid Plant with pressure of 1200mm water column at 40deg C.
- 2) Chlorine : At the main isolation Valve in the existing Acid Plant with pressure of 1000mm water column at 40deg C, saturated with water vapour.

Cl ₂	:	95 % v/v
O ₂	:	1.8 % “
H ₂	:	0.5% “
Inert (CO ₂ , N ₂ etc.)	:	2.7 % “

- 3) Absorption water : At the ground floor level with a pressure of 2.0Kg/cm²g and 32°C
Flow rate : 10 Nm³/Hr
Conductivity : < 10 μ Siemens/cm
- 4) Boiler Feed water: from the soft water tank at 2.0 M head located in our existing boiler house.

At the required Point with a pressure of 2000 mm of water column.
Temperature 32°C

pH 10-11

Approximate flow rate 6M³/Hr

Total Hardness (CaCO₃) < 5mg/l

Total Alkalinity (CaCO₃) 600mg/ l

Total Chlorides (CaCO₃) < 100mg/l

PO₄ 100mg/l

- 5) Cooling water: Cooling water at 2.0Kg/cm²g and 35°C will be made available at the ground floor level.
- 6) Power: Power at specified ratings (415V/230V) for all the prime movers/instruments etc. will be made available.
- 7) Compressed air and instrument air: Instrument air at 4 – 6 Kg/cm²g and at a dew point of -7°C will be made available at the required points
- 8) Nitrogen gas at 2.5 Kg/cm²g will be made available from Nitrogen Generation Unit at the required points
- 9) Emergency Power: will be arranged by TCC. The tenderer shall give the total requirement of emergency power.

9.3.2 OUT GOING

- 1) 32 % –Hydrochloric acid at and temp of \approx 45^o C at the inlet of HCL Storage vessel in the Acid plant.
- 2) Saturated Steam at a pressure of 10 bar (g) at the equipment steam outlet
- 3) Cooling water – at a return pressure of minimum 0.5 Kg/cm²g at 42°C maximum.
- 4) Effluent: All effluents to be directed and terminated at our Effluent streams. Vent gas from the Tail Gas Absorber (TGA) shall be directed to our dilute caustic scrubber unit.

Vent gas specifications

Flow rate	:	300 Nm ³ /Hr Max
Temperature	:	\approx 40 °C
HCl content at TGA outlet	:	15mg/Nm ³
Cl ₂ content at TGA outlet	:	5 mg/Nm ³

CHAPTER - 10
MECHANICAL WARRANTY ON EQUIPMENT

10.1 Mechanical Warranty

10.1.1 The CONTRACTOR shall give warranty that the materials and workmanship of EQUIPMENT shall be free from defects and be in conformity with the specifications supplied by the CONTRACTOR.

10.1.2 The period of mechanical warranty shall be TWENTY FOUR (24) months from the date of successful commissioning of the plant.

10.1.3 Such mechanical warranty shall not cover loss or damage arising from occurrence of any of the following unless mutually agreed otherwise between the parties hereto.

- a) Malfunction or deficiencies caused by defective or inappropriate machinery, materials, and/or equipment, which are not supplied by CONTRACTOR directly or indirectly.
- b) Mishandling or negligence or inappropriate operation, maintenance, storage or use of equipment.
- c) Failure to adequately maintain CONTRACT EQUIPMENT in accordance with the instructions of CONTRACTOR and in accordance with the operation and maintenance manual to be provided by contractor, under the operating conditions more severe than the design range of CONTRACT EQUIPEMENT.
- d) Modification or alteration to CONTRACT EQUIPMENT without contractor's prior written consent.

10.2 Remedies

10.2.1 Should any defects in design, materials and workmanship, be found, TCC shall notify contractor of such defects and contractor shall remedy the same in accordance with one or more of the following methods to be agreed up on between the parties hereto:

- i) Contractor shall, immediately after receipt of TCC's notice of defect, deliver to TCC on CIF Cochin port /FOR TCC warehouse basis the part or whole of the equipment to replace the defective part or the whole of the equipment. TCC shall return the defective part(s) or equipment

as the case may be to contractor as soon as practicable after receipt of such replacement part or the whole of the equipment by TCC. The freight and insurance charges involved in this shall be borne by contractor including duty, if any.

- ii) Contractor shall, immediately after receipt of TCC's notice of defect, deliver to TCC on CIF Cochin port/FOR TCC warehouse basis the part or whole of the equipment to replace the defective part or the whole of the equipment. TCC shall return the defective part(s) or equipment as the case may be to contractor as soon as practicable after receipt of such replacement part or the whole of the equipment by TCC. The freight and insurance charges involved in this shall be borne by contractor including duty, if any.
- iii) Contractor shall, immediately on receipt of TCC's notification of the defects, depute engineer(s) to CONTRACT EQUIPEMENT at their expense to provide the supervisory services for repair or replacement of defective part or equipment, if such deputation is required.

10.2.2 The skilled workers required for replacement work referred to in clause 10.2.1 above shall be arranged by and paid for by the CONTRACTOR.

CHAPTER - 11

PERFORMANCE GUARANTEE

11.1 Performance guarantee.

- 11.1.1 The performance of the CONTRACT EQUIPMENT is to be proved as per performance guarantee furnished by the CONTRACTOR for a continuous period of 72 hours with respect to Unit's capacity for the output of acid and steam, product quality, Vent gas specifications, operating parameters and consumption of utilities.
- 11.1.2 Guarantee test runs are to be conducted after the plant is operated continuously for 7 days at an average load of 80% or on achieving full rated capacity continuously for 2 days after START- UP, whichever is earlier. The guarantee test run should be completed within six months from the date of completion of erection of the plant. During guarantee test run no standby equipment shall be used in parallel for proving the guarantee.
- 11.1.3 Successful completion of guarantee test shall not relieve the tenderer of his obligations and responsibility in any manner with regard to modification/rectification/replacement to meet warranty.
- 11.1.4 During the guarantee test run, if the plant fails to meet the guarantee figures, the contractor shall modify the plant and systems at his risk and cost to achieve the guarantees within the agreed stipulated time. The liability of the contractor in such an event shall as per clause 11.2 below.
- 11.1.5 If the unit does not perform to the guaranteed figures, the contractor should modify/rectify/replace the system or equipment to attain the guarantee figures and conduct guarantee test run again as per Clause 11.1.

11.1.6 Guarantee Requirements of TCC

Sl.No	Details	Qty/Value	Unit	
1.	HCl production(100% basis)	60 Min.	TPD	
2.	HCl product concentration	32 Min.	%	
3.	HCl product free chlorine	50 Max.	ppm	
4.	HCl product temperature	45 Max.	Deg. C	
5.	Steam Pressure	9 Min.	Bar (g)	
6.	Qty. of saturated steam	24 Min.	TPD	
7.	Emission parameters	Chlorine	5 Max.	mg/Nm ³
		HCl	15 Max.	mg/Nm ³

Bidder may improve upon the above and offer their guaranteed values against each of the above requirements.

11.2 Liquidated Damages

Contractor's liability for non-fulfillment of guarantee shall be as follows:

11.2.1 If any of the guaranteed figure of performance of CONTRACT EQUIPMENT is not attained during the performance guarantee test run, the contractor shall at TCC's option compensate TCC by paying liquidated damages as provided hereunder within thirty (30) days after both the parties mutually confirm the non-fulfillment of the performance obligations.

11.2.2 **a) Production capacity** : In case of any shortfall in production capacity from the guaranteed figures for reasons solely attributable to the Contractor, the Contractor shall under exclusion of any further claims, pay Liquidated Damages at the rate of

For Steam

@ Rs.15 lakhs for every full 0.5% shortfall in the capacity from the guaranteed value offered by the bidder. Provided that the short fall does not exceed 5%

For HCL Acid

@ Rs.2.5 lakhs for every full 0.5% shortfall in the capacity from the guaranteed value. Provided that the short fall does not exceed 5%.

b) Product Qualities: If for any reasons solely attributable to the Contractor, the guaranteed product quality is not reached, then the Contractor shall be under exclusion of any further claims, at its own cost

carryout necessary modifications in the plant so as to achieve the guaranteed production qualities.

In case the variations in the guarantee parameter are within the limits for which the Liquidated Damage is payable the Contractor have the option to repair or replace the plant to the extent to pay the Liquidated Damages as above.

In case of a shortfall in production capacity below 95% of the guarantee figure as evidenced by the guarantee test run due to the reasons solely attributable to the Contractor, the Contractor shall at its own cost carryout necessary modifications in the plant so as to achieve at least 95% of the guaranteed production capacity.

Delay in Time Schedule: In case of any delay plant start- up beyond the guaranteed schedule for reasons solely attributable to the Contractor, the Contractor shall pay Liquidated Damages at the rate of Rs 7 lakhs for every completed week of delay subject to a maximum of Rs.70 lakhs.

Guarantee of trouble free life of major components.

11.3.1 Life Guarantee

Contractor shall guarantee 24 months trouble-free operation of the CONTRACT EQUIPMENT provided if operated in accordance with the manuals and instructions to be submitted by Contractor.

11.3.2 Notwithstanding the provision in Chapter 11, Clause 11.3.1 above, the guarantee shall not apply in the case of the following :-

For the replacement of major components as a part of scheduled periodical replacement specifically mentioned in the maintenance manual/procedure.

11.3.3 Remedies

If TCC certifies and contractor acknowledges that any of major components failed to fulfill the guaranteed life set forth in 11.3 hereof; and such failure is solely attributable to contractor, the following remedies shall be taken.

11.3.4 Contractor shall supply TCC with new components to restore the performances of the equipment the normal condition, on FOR TCC warehouse basis, free of cost. TCC shall then return such damaged spare at TCC's expenses on FOB basis.

CHAPTER - 12
SECRECY OBLIGATION

Any proprietary information or drawings disclosed or submitted by contractor to TCC or TCC to Contractor under this agreement shall be kept in strict confidence by the receiving party, and any content thereof shall not be disclosed by the receiving party to any third party for ten (10) years from the date of each disclosure of any proprietary information, without prior written consent of contractor.

Any proprietary information or drawings disclosed or submitted by TCC to the contractor shall be kept in strict confidence by the CONTRACTOR, and any content thereof shall not be disclosed to any third party for ten (10) years from the date of each disclosure of any proprietary information, without prior written consent of TCC

Obligation in this Chapter -12 shall not be applied to the information that;

Is published or hereafter become published or otherwise generally available to the public without fault of the receiving party.

Was in possession of the receiving party prior to the disclosure by the disclosing party which the receiving party can demonstrate by documents.

Is received on a non-confidential basis from a third party who is not under confidentiality obligation with the disclosing party which the receiving party can demonstrate by documents, or

Is disclosed to employees and agents of the receiving party for the purpose of establishing and operating the CONTRACT EQUIPMENT provided that the receiving party in turn binds such employees or agents to secrecy as stated herein.

CHAPTER - 13

TENDER NOTICE

The Notice Inviting Tender shall be deemed to be part of this agreement and incorporated herein.

CHAPTER – 14

GENERAL TERMS AND CONDITIONS

- (i) TCC's ESI/PF practices for contract work as well as safety provisions stipulated have to be followed. If any worker employed by you meets with any accident in the course of the work, you will be liable to pay compensation.
- (ii) You must give the list of workers to be engaged by you for this work to our Chief Security Officer.
- (iii) Attendance particulars of all employees working under you for the contract shall be furnished to our Finance Controller on the 5th and 20th of every month.
- (iv) The workers already covered by PF and ESI by the contractor may furnish a declaration in the specified format by providing details of ESI and PF of each worker along with copy of monthly return substantiating the claim. In the case of workmen not covered by the contractor, the ESI and PF contributions shall be deducted from the contractor's account.
- (v) In case of damage to any of the TCC's equipments on his account of fault, intentional or unintentional on the part of the contractor, TCC reserves the rights to recover the cost of such damage from the contractor's bill.
- (vi) An amount equivalent to 1% of bill amount after deducting cost of departmental material is liable to be deducted from your running/final bill towards the contribution to Kerala Construction Workers Welfare Fund.
- (vii) The Contractor shall be liable pay compensation in the event of any worker employed by you meets with an accident arising out of and in the course of the work.
- (viii) The contractor shall provide all necessary safety measures to protect the public as well as his own workmen from accident. And shall be bound to bear all expenses of defense of any person for injury sustained owing to neglect of safety precautions and to pay any damages and cost of awarded in consequence as per rules in force.
- (ix) The workers engaged by the contractor shall take particular care not to cause any damage to the company property and in case of any damage is caused, you have to take good loss incurred by the company by such negligent action.
- (x) In respect of labour directly or indirectly employed in work for performance of contractor's part to this contract, contractor shall at his own expenses, arrange for all safety provisions and shall also observe and abide by all safety regulations of the company.
- (xi) The work shall be carried out as per the instructions and to the satisfaction

of Assistant General Manager (Projects).

- (xii) The contractor shall bring his own men with required skill and tools for the work. Please ensure that only trained workers are engaged for the work. It should also be ensured that only tested equipments are used and should be verified / validated by the Electrical Department, TCC.

CHAPTER - 15
PATENT INFRINGEMENT

If the use of know-how/technology supplied by CONTRACTOR hereunder in production of products in CONTRACT EQUIPMENT is alleged to infringe a valid patent or patents in India or other countries, of any third party, upon TCC/s notice in writing within thirty (30) days of such allegation being made, contractor shall at their expenses defend or settle said claim or at its expense defend or settle said claim or replace such EQUIPMENT with equipment not infringing in any way the said patents of such third party, such new equipment utilitywise and performance wise being at least equal to equipments replaced.

Contractor may request TCC reasonable assistance in doing so at contractor's expenses. In the event that contractor settles the said claim, it shall, as a part of such settlement obtain for TCC retrospective right, free of additional payment for contractor or any third party, to use know-how under such third party's relevant patent(s). In any event, if TCC is called upon to pay any damages or compensation to such third party, the same shall be reimbursed to TCC by contractor.

CHAPTER - 16

FORCE MAJEURE

Force majeure referred to herein means an occurrence beyond the reasonable control and without the fault or negligence of the party affected including, but not limited to, Act of God, flood, typhoon, earthquake, tidal wave, landslide, fire, plague, epidemic, quarantine restriction, perils of the sea, war or threat of the same, civil commotion, blockade, arrest or restraint of the government, rulers or people, requisition of vessel or aircraft, strike, lockout, sabotage, other labour dispute, explosion, accident or breakdown in whole or in part of machinery, plant, transportation or loading facility, governmental order or regulation, or any other causes or circumstances whatsoever beyond the reasonable control of the party affected.

Any delay or failure in performing the obligations under CONTRACT by either party hereto shall not constitute default under contract, or give rise to any claim for damages or loss or anticipated profits if so, the extent of such delay or failure is caused by force majeure.

If either party hereto shall delay or envisage delay in performing obligations under contract by reasons of force majeure, and cannot avoid or prevent said delay by any reasonable effort, it shall promptly notify the other party hereto of the occurrence of force majeure.

Under the circumstances of force majeure, both parties shall discuss in good faith to find appropriate counter measures to be taken.

After cessation of the intervention by such causes or circumstances as referred in this chapter hereof, work and service under contract, however, shall be resumed as soon as practicably possible and contractual time limits shall be extended to the extent as affected by such intervention by aforementioned reasons.

CHAPTER - 17

JURISDICTION, ARBITRATION AND GOVERNING LAW

Governing Law:

This contract shall be governed by the laws applicable to India.

Courts in Ernakulam, Kerala, India will have exclusive jurisdiction to decide any matter arising between the parties.

All disputes arising out of the performance of the obligations under the CONTRACT shall be settled through amicable negotiations between the parties hereto and in case no agreement can be reached, they should be settled by arbitration by sole arbitrator under the provisions of the Arbitration and Conciliation Act, 1996. If the parties are not able to nominate a sole arbitrator within a period of two (2) months from the conclusion of the unsuccessful negotiations for the settlement, each of the parties shall nominate an arbitrator as provided in the Arbitration and Conciliation Act, 1996 and the nominated arbitrators shall nominate the third arbitrator, then the arbitrator shall be appointed in the manner provided in the Arbitration and Conciliation Act, 1996. The seat of Arbitration shall be Cochin, Kerala State, India.

CHAPTER - 18

TECHNOLOGY UPDATING

Contractor shall provide any other services required for the establishment of systems and provide all technical support for updating/upgrading the technology during 10 years operation from the date of successful commissioning of the object.

CHAPTER - 19

EFFECTIVE DATE

CONTRACT shall be in full force and effect from the date when all of the following conditions have been fulfilled.

Receipt by TCC of all the approvals by our Government.

Receipt by CONTRACTOR of all necessary approvals by the Government of Contractor's country.

On receipt of initial payment by the contractor as per terms of contract.

Both parties hereto shall exercise due diligence and their best efforts in obtaining all such approvals, and if all such approvals have not been granted within six (6) months after execution of CONTRACT, each of the parties shall have the right to terminate CONTRACT and shall thereafter be under no obligation whatsoever to other party by virtue of CONTRACT, unless further agreement is reached between TCC and CONTRACTOR.

CHAPTER - 20
TERMINATION

Upon default by either of the parties hereto in the performance of any obligation hereunder to be performed by such party, the other party may give notice in writing to such party in default specifying the thing or matter in default. If such default is not cured within two months following the service of such notice, the party giving such notice is entitled to terminate the CONTRACT. Such termination shall not relieve either party from any obligations accrued up to the date of such termination or relieve the party in default from liability and damages to the other for breach of CONTRACT.

Either party shall have the right to terminate the CONTRACT forthwith by giving the other party ten (10) days notice to that effect upon the occurrence of any of the following events to the other party,

Liquidation, bankruptcy or insolvency;

Termination of its business;

The appointment of any trustee, receiver or liquidator for substantially all of the assets of the business which trustee, receiver or liquidator is not discharged within thirty (30) days from appointment;

The attachment, sequestration, execution or seizure of substantially all of the assets, which attachment, sequestration, execution or seizure is not vacated within thirty (30) days from the institution thereof;

Judicial expropriation, nationalization or any sale of substantially all of the assets.

Notwithstanding the termination of CONTRACT, neither party shall be relieved from liability to the other party for any breach of CONTRACT, and obligation to pay any or all amount due then to other party with respect to the CONTRACT occurring prior to such termination or from secrecy obligations of Chapter-12 hereof.

IN WITNESS WHEREOF the parties hereto have set their hands on the date first above written.

Signed.....

On behalf of TCC

..... (Name)

..... (Designation)

Witness:

1)

2)

Signed.....

on behalf of Contractor

.....(Name)

.....(Designation)

Witness:

1)

2)

Note: There can be two agreements.

1. Agreement for Licensing of know-how and Basic Engineering, Detailed Engineering and Technical Services.
2. Agreement for supply & commissioning of equipment.