



E - TENDER DOCUMENT

FOR

**Design, Supply and Labour job for Installation, Testing and Commissioning of
Pre Processing & UHT Plant with Associated Utilities
at
OMFED Dairy, Arilo-Govindpur, Cuttack**

Estimated Cost: Rs.12,40,00,000/- including GST

Tender Paper cost : Rs.10,000/- + GST



THE ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD.

BHUBANESWAR

September-2026



The Orissa State Cooperative Milk Producers' Federation Ltd.

D-2, Sahid Nagar, Bhubaneswar-751 007.

Ph No- (0674) 2546030/2540273/2540417,

Fax No (0674) 2540974

e-TENDER NOTICE

OMFED invites techno-commercial offers from experienced bidders for

Design, Supply and Laboure job for Installation, Testing and Commissioning of PreProcessing & UHT Plant with Associated Utilities at OMFED Dairy, Arilo-Govindpur, Cuttack".

Interested bidders may download the tender document from the OMFED website www.omfed.com only for reference. **Bid document will be available in the <https://tendersodisha.gov.in> from 10.00 AM of dt.01.09.2026 to 2.00 PM of dt.22.09.2026 for bidding. Tender cost of Rs.10,000/-+18%-GST(i.e. Rs.11,800/-) along with E.M.D of Rs.25,00,000/- shall be deposited through online portal at <https://tendersodisha.gov.in>.The technical Bid shall be opened at 03:30 PM on dt.24.09.2026 in the presence of the interested bidders at OMFEDCorporate Office, D/2, Sahid Nagar, Bhubaneswar – 751007 through <https://tendersodisha.gov.in>. Bids without requisite EMD shall not be considered.**

Tenderers are requested to visit OMFED website and <https://tendersodisha.gov.in> regularly as any corrigendum / addendum may be published in OMFED website and not in any other media/ newspapers.

OMFED reserves the right to accept or reject any or all the tenders or part thereof without assigning any reason.

**MANAGING DIRECTOR
OMFED**



The Odisha State Cooperative Milk Producers' Federation Ltd.,
D-2, Sahid Nagar, Bhubaneswar-751007.
PhoneNo: 0674-2544576, 2546030, 2546121, 2540417, 2540273.
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DETAILS

e-Tender for	Design, Supply and Labour job for Installation, Testing and Commissioning of PrProcessing & UHT Plant with Associated Utilities at OMFED Dairy, Arilo-Govindpur, Cuttack".
Reference No.	Proj/184/5LLPD Dairy/26
Cost of Tender Form	Rs.10,000/- + 18% GST
Schedule-I	Eligibility Criteria
Schedule-II	Delivery Schedule.
Schedule - III	Payment terms & EMD
Schedule - IV	General terms & Conditions
Schedule - V	Commercial Bid.
Schedule - VI	Technical bid
Contact Person	Mr. Sudhansu Sekhar Panda, Dy. Manager (Projects & DO), Mobile: 9437092014
Earnest Money Deposit	Rs.25,00,000/-
Date and time of Pre-bid Meeting	dt.10.09.2026 at 15:00 hours
Last date and time for submission of tender document	dt.22.09.2026 till 14:00 hours
Date & Time for opening of Tender	dt.24.09.2026 till 15:30 hours
Address for communication	Managing Director Orissa State Cooperative Milk Producers' Federation Ltd., D-2, Sahid Nagar, Bhubaneswar-751007 (Odisha)

Managing Director

1. INTRODUCTION

The Odisha State Co-operative Milk Producers' Federation Limited (OMFED) have settle a 5LLPD automated dairy plant at ARILO-Govindpur Tehsil – Barang Cuttak– ODISHA. As a part of the project, a 60000 LPD UHT milk processing and Aseptic Filling station had already set up. So to packed different Product for this case need one more plant shall have pre-processing and one UHT Aspetic Processing Line to packed daily 30KLPD products.

The UHT processing shall be an independent unit with services viz. steam, electrical power, and chilled water to be drawn from the centralized utilities, as defined in the detailed specification and battery limits.

The bidder shall be responsible for developing the conceptual design. The process description given in this package is for guidance to the bidders for designing the UHT Plant. The bidders are to identify the required equipment/ items from the process descriptions given and functional needs asked for and develop the process flow diagram. Bids shall include all the equipment so required and include their complete specifications along with drawings, Literature/brochure, dimensional details, write up etc. It is necessary that the bidders shall submit a systematic and technically clear offer.

All the equipment for the plant shall be designed, supplied and installed in accordance with the prevailing and applicable standards. The bidder shall be responsible for arranging approval from various applicable Indian Statutory authorities on behalf of the Purchaser. The Purchaser, on production of documentary evidence, shall reimburse the statutory fees.

The design and layout of the additional facilities, selection of equipment and services, methodology of plan execution, testing and commissioning shall be carefully planned and executed with the knowledge of normal operational & processing routines of the UHT plant.

The general technical specification of the major components and the ancillary items described in the technical section, its capacities and quantities proposed by the Purchaser are furnished in the 'basis of design' and 'schedule of quantities. These are only for the guidance of the bidders to quote their prices on comparable basis. However, it shall be construed and understood that bidder is familiar/ acquainted about the nature and the quantum of work involved and has submitted his offer without deviating the basic configuration of the plant. The bidder is advised to visit Arilo Govindpur site before submitting the offer.

The quantity of pipes, fittings, valves, cables, cable trays, earthing, instruments, structural and supports etc. are to be offered based on the actual requirement at site. The bidder shall have to work out the details based on the system offered

PROJECT SITE DETAILS:

Project Authority : Odhisa State Co-operative Milk Producers' Federation Limited (OMFED)

Site Address : 5LLPD dairy plant at ARILO-Govindpur Tehsil – Barang Cuttak– ODISHA

Nearest Railway Station: Cuttack

Nearest Airport : Bhubaneswar

BID PACKAGE

The entire contract broadly comprises three parts viz

Part A: Design, engineering & supply of Pre- Processing & UHT Processing unit and allied service equipment, accessories & spares

Part B: Labour charges & consumables for installation, testing and commissioning of Pre-Processing & UHT Processing unit and allied service equipment, accessories

Part C: Stand by operation & services cover for a period of one year from the expiry date of guarantee period within tial service cover after successful commissioning

Schedule – I

ELIGIBILITY CRITERIA:

1. The bidder should have minimum 5 years' experience in related field like supply/installation/Erection & commissioning of equipment's of Pre- Processing, UHT Processing of similar or greater capacity.
2. The average annual sales turnover of the bidder should not be less than Rs.100.00 Crore for the last three financial years starting from 2023-2024, 2024-2025 & 2025-26.
3. The bidder should have **positive net worth in last two financial years.**
4. The Bidder in the same name and style shall have successfully executed/completed contracts of similar nature of works ("Design, Supply and Labour job for Installation, Testing and Commissioning of PrProcessing & UHT Plant with Associated Utilities for Dairies or Beverage industry in India") during the last five years ending last day of the month previous to the month in which bid is opened, either of the following:
 - One Contract/Work of similar nature costing not less than 80% of estimated costs
OR
 - Two Contract/ Work of similar nature costing not less than 50% of estimated costs
OR
 - Three Contract/ Work of similar nature costing not less than 40% of estimated costs
5. Even though the bidder meets the specified criteria, it may be disqualified if it has:
 - Made untrue or false declaration in the forms, statements and attachments submitted in proof of their qualification.
 - Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion or completing the contract, inordinate delays in completion or
 - If the bidder is overbooked beyond his capacity to execute the work as per required schedules.

SCOPE OF WORK:

- **Design, Supply and Laboure job for Installation, Testing and Commissioning of PrProcessing & UHT Plant with Associated Utilities at OMFED Dairy, Arilo-Govindpur, Cuttack”.**

DESIGN BASIS:

The basis for the proposed plant and various sections shall be as follows;

Standardized and pasteurized milk / Fermented product milk shall be made available from existing UHT milk Silo (2X20 KL) to the inlet of blending tank valve cluster by Bidder. The blending system prior to UHT plant shall be used for preparation of Flavoured milk / Salted Spices Butter Milk (0.49 % salt max) / Sweet Lassi/ Clear Juices processing. Only one type of product shall be processed and transferred to UHT during one production cycle. A High Shear Mixer/ blender should be offered for blending purposes. A High Shear Mixer / blender shall be to add ingredients such as sugar, SMP, Flavours and other minor ingredients required for Flavour milk, other beverages, lassi, etc. Juices should be also made using fruit pulp / concentrates. For the same additional system for sugar syrup preparation and beverage raw material preparation sections are provided.

The blending Plant and UHT plant shall be designed for 20 Hours operations per day + CIP. Aseptic filling line shall run continuously for 20 hrs run to packed 30000LPD product as guarantee period as asked in the tender.

For continuous operation there will be 2 Nos. of blending tanks. The blending tanks shall also be acting as buffer tanks for feeding to UHT plant. The plant shall be automatic in operation excluding some operations like sugar/SMP dumping, flavours or spices in the mixer / tanks etc.

The various sections shall be as follows:

- RO /Curd Milk Pasteurizer & Water storage System.
- Sugar syrup Preparation area
- Beverage raw material preparation system
- Blending system for Product preparation
- High Shear Mixer \ Blender Section
- UHT Sterilizer and Aseptic Buffer Tank
- CIP system as required for Aseptic Buffer Tank & Non Aseptic Product Cleaning.
- Automation for UHT plant and Aseptic Filling Line section integration.
- Field Instruments, Control Valves and Accessories
- SS Pipes (Milk/Product/CIP), Fittings and Valves
- Utility distribution for Blending Section, UHT and Aseptic Filling Line for complete scope of bidder Pack-1

BLENDING SECTION

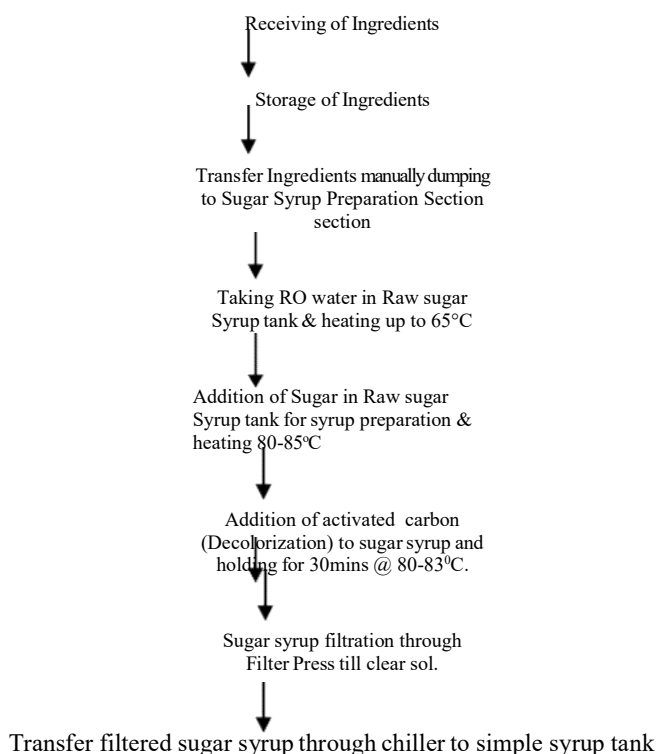
1. PASTEURIZED RO WATER STORAGE SECTION

Standard treated RO water shall be provided as per Battery limits specified. This water shall be Pasteurized and stored into 1 x 20 KL RO Water tank. This water shall be dosed into blending tanks for Juice \ Milk based Beverage preparation.

For Curd Milk Pasteurization purpose Standardized Milk bidder shall be taken from Existing 2 X20 KL Milk Storage Silo in UHT section . The Milk shall be taken at 4 deg C and heated at 90 Deg C for 10min Holding with 42 Deg Out from the Curd Milk Pasteurizer that shall be stored in Blending Tanks as per the Batch Preparation.

2. SUGAR SYRUP PREPARATION SECTION

The Basic Flow of the Sugar Syrup Preparation shall be as follows:



Sugar Syrup preparation shall be done keeping in mind the standard practices used in the beverage industry. Sugar dosing in the beverage shall be done from 7% to 15% based on type of product being made. It should be possible to make a range of 60 to 65 Brix Sugar syrup. Flow diagram to be followed. The entire setup shall be fully automatic except the dosing of sugar into the sugar hopper which shall be done manually. The final prepared sugar syrup shall be dosed based on flow meter readings as required. There shall be provision provided for doing CIP of entire Sugar syrup system. Tank and line CIP can be clubbed as required by the process.

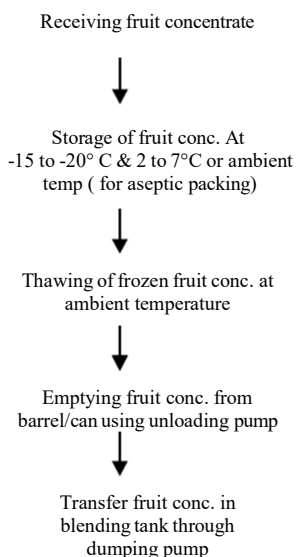
Regenerative heating shall be done for incoming water which shall be heated via sugar syrup prepared. The Hot water received shall be stored into hot water tank as asked in the RFQ. The PHE shall be three stage PHE.

The sugar syrup shall be first cooled using incoming RO water and shall be stored into the Hot Water tank.

In second stage cooling shall be done via cooling tower water. Cooling tower shall be in the scope Purchaser. Bidder shall take tapping from nearest Cooling tower Main header for Supply and return line. The Third stage cooling shall be done via chilled water as required.

3. BEVERAGE RAW MATERIAL PREPARATION SYSTEM

Fruit pulp/concentrate shall be brought in the barrels/cans. Following is the flow chart for the process.



CIP provision shall be provided for fruit pulp unloading and dosing system .

4. COCOA SLURRY AND PECTIN MIXING SYSTEM

For the Cocoa Slurry preparation, pre-weight Cocoa Powder is suitable for 10-12 % slurry manual addition to high shear mixer. During Preparation the Cocoa Slurry tanks take ambient or Hot RO water recirculation with High shear mixer and Heating through PHE heater up to 80-85 deg C once reached temperature as per set point of Cocoa Slurry Tank stop recirculation and keep for Cooking /hydration at 85 Deg C for 30min with jacket heating to maintained respective temperaturfe. Once hydration is finished Cooling through PHE Cooler in Recirculation up to 12 - 14 Deg C. Similarly for Pectin Preparation using Common setup of High shear mixer and Heater/Cooler and separate Pectin preparation Tanks both tanks capacity and qty as per SOQ. The pectin /Cocoa Slurry dosing shall be done to the blending tanks using flow meter. CIP provision shall be provided for both dosing system and Preparation System.

Both Cocoa & Pectin Tanks valve battery including CIP return header shall consist of cleaning type mix proof valves with 3 solenoids each. The valve battery shall have a SS-304 tray below the valves. All lines shall have drain provision so that after each use the line can be drained if required and no water / product is kept stagnant in the valve battery. Flushing provision including CIP for tank outlet/inlet lines shall be provided.

5. INGRIDENT PREPARATION AND DOSING SYSTEM.

Ingrident solution can be prepared by Take RO water to Preparation Tank. Manually dump ingreidents to the solution tank and mix through agitator and Transfer to Blending Tank through flowmter all operation are automatic Tranasfer except ingredients dumping shall be manual activity. Provide local On/Off Push button panel for Agitator on /off Purpose. Flushing provision including CIP for tank outle lines shall be provided.

4. BLENDING SECTION

Blending section shall prepare high acid as well as low acid beverages. The beverages shall be milk based, fermented drink, clear juices.

The standardized and pasteurized milk / fermented product milk (base milk for Lassi /butter milk without ingredients) shall be made available at the inlet of 2 x 15 KL Blending tanks via 3 independent pipelines. Bidder shall make an incoming product valve battery using mix proof valve through which it shall feed the Blending tanks with required base products. The incoming nozzle for the base products shall be from the top of the tank. Also the recirculation line from powder blender/High shear mixer shall be attached to the same incoming product valve battery so that recirculation product can be received via top nozzle. CIP of incoming base product lines shall be in the scope of bidder. CIP for entire Blending section including tanks, lines and blender shall be provided by bidder in the Blending section shall plan the CIP distribution valves, CIP forward and return lines as required in the section. CIP return line shall be connected to nearest return header. During Fermented product equipment CIP, the solutions shall be drained in the CIP kitchen.

Blending tank shall be used for preparation for final product mix such as Juices, Milk based beverages, etc. Various ingredients dosing shall be provided as asked in the tender.

Blending tank Loading Valve Battery Shall have following headers

- Loading header Single header shall have connection which shall accommodate Pasteurized Standardized Milk, & Fermented Product Based Milk. Entire operation shall be fully automatic and Qty based transfers shall be requested.
- Loading header from Powder Blender recirculation line with mass flow meter and provision to add Rinse recovery product and RO water.
- Loading header for dosing Sugar Syrup, Fruit pulp / pectin/ingredients based dosing. All line shall be connected automatically to this loading header.

Above Product Transfer from respective section plant shall be based on communication request received from the Blending Section. Following basic communication shall be established.

- Request to start transfer pump
- Request to stop transfer pump
- Request stating quantity of product to be transferred
- Request stating flowrate of product transfer
- Request for CIP of incoming header with required valve status

The ingredient mixing and preparation system shall have a specially designed Powder blender /high shear mixer of suitable capacity with all accessories for preparation of concentrate batch (Milk + Ingredients). It shall be used for adding and mixing of all the required ingredients (like sugar, Milk powders, flavours o etc.) to 2 x 15 KL tank. Recirculation facility shall be provided for 15 KL tanks for proper mixing of ingredients. For Sugar, the same shall be dosed directly into the Powder Blender in recirculation with milk product from blending tanks. Ingredients shall be dumped manually to the hopper of the Powder blender as per the batch requirement. A suitable capacity blender and heater cum cooler shall be provided. A Pipe In Pipe type duplex filter and magnetic filter shall also be provided to filter any impurities from the sugar /ingredients. There will be a bypass arrangement provided for the mixer and heaters/coolers.

The Powder blender/ mixer valve battery shall consist of self-cleaning type mix proof valves with 3 solenoids each. The system shall also utilize rinse milk for RCM preparation. The valve battery shall have a SS-304 tray below the valves.

In case of lassi or Butter Milk processing bidder shall make available pasteurized curd milk from curd milk pasteurizer at the inlet of blending tank at 42 to 44 Deg C. Curd shall be formed in the blending tanks using culture addition. Once the curd is formed, the curd shall be broken using the agitators and required amount of RO water shall be added to the product. Further spices/sugar /flavour as required for lassi or Butter milk shall be added in the blending tank via powder blender. In case of flavoured milk preparation, Bidder shall make available the standardized pasteurized milk at the inlet of blending tank and further ingredients like flavour, Cocoa Slurry, etc via. mixer shall be dosed in the blending tank as per the requirement.

Blending tank Un-loading Valve Battery Shall have following headers

Unloading header to Powder blender/ High Shear Mixer

Unloading header to UHT Plant

CIP Return header for Blending Tanks

Complete system shall be fully automatic in operation and shall be operated from Main SCADA only.

Automatic RO water purging/pushing of milk lines as per pre-set interval & rinse recovery system shall be provided. Water purging of all other milk/product transfer lines shall also be provided. The water purging system shall be magnetic flow meter and/or timer based. Rinse water flushing of pipelines/ tanks/equipment & recovery of the same in rinse milk collection tank shall also be provided before CIP operations. The rinse milk recovery system shall be flow meter/ timer based.

All blending tanks shall have a mix proof type outlet valve with water push provision to completely CIP or water push the silo outlet/inlet line.

Valve manifold shall be designed to ensure the flexibility in operation & secured (full proof) against mixing of two different flows/CIP fluids in case of malfunctioning in system/equipment or power failure. The lateral headers of the valve battery shall have independent water flushing & CIP facility without affecting any other operation except that particular blending Tanks. The valve battery shall have a SS-304 tray below the valves.

The Blending tank valve battery including CIP return header shall consist of self cleaning type mix proof valves with 3 solenoids each. The valve battery shall have a SS-304 tray below the valves. All line shall have drain provision so that after each use the line can be drained if required and no water / product is kept stagnant in the valve battery. Flushing provision including CIP for tank outlet/inlet lines shall be provided.

Pneumatically operated drain valves would be provided at all lowest points/suitable locations in the piping system to ensure complete draining of entrapped water/very diluted mixed phase from the system.

All equipment, valves, pipes, fittings, instruments shall be sanitary type. Welded connections should be provided wherever practical, to minimize the use of fittings. Sampling valves (easy to operate/easy clean type) to be provided at required points. Necessary controls and instruments including flow meters, level transmitters/sensors, conductivity transmitters, pressure/ temperature sensors/ transmitters, flow switches, proximities etc. shall be provided as per functional requirement.

SS platform fabricated from chequered plate, box section and staircase with skirting & pipe railing shall be provided for all Blending Tanks and Powder Blender for dosing purpose.

5. CIP Station for Non-Aseptic Equipments Cleanings.

General

There shall be Two automatic CIP systems for Pre-Processing (Blending) Section & UHT processing plant milk having 2 (min) circuit. The CIP system should be able to be operated independently, with its own set of CIP tanks, THEs, filters, pumps, valves and fittings, instruments etc. The CIP system shall clean all the product handling equipment, storage tanks and pipeline network including all product transfer lines.

The entire CIP operations (including receiving and dosing of concentrates) shall be normally operated, controlled and monitored from the control room.

Necessary valves (**seat valves**), piping, controls and instrument including flow meters, level sensor, conductivity transmitters, temperature sensors/transmitters, flow switches, proximities etc. are included in scope of supply.

The system shall be totally secured (full-proof) against mixing of the cleaning solutions with the products in case of malfunctioning in system/equipment or power failure. Fail Safe requirement is envisaged in scope of work.

The system shall be fully automatic and pre-programmed with facilities of selecting and modifying the cleaning sequence and duration from the control room.

Blending Plant CIP kitchen: 2 Circuit (2x25 KLPH)

The capacities of the CIP tanks with MOCs are mentioned below:

Tank Name	Size	Construction type	MOC
Flush Water tank	3 KL	Single walled	SS-304
Lye Sol. Tank	3 KL	Insulated	SS-316
			SS-304 cladded
Acid Sol. Tank	3 KL	Insulated	SS-316
			SS-304 cladded
Hot water tank	3 KL	Insulated	SS-304
			SS-304 cladded
Recuperation tank	4 KL	Single walled	SS-304

Conductivity transmitters shall be provided in acid & lye tanks, for automatic dosing of desired quantity of lye & acid concentrate.

Two no. of 25 KLPH CIP forward circuit with suitable supply pumps (VFD operated) and CIP return pumps of suitable flow rate and pumping head as per the design of plant have been envisaged. **Bidder to work out the CIP schedule in detail.** Control of CIP Forward pumps would be operated with frequency drives with close loop feedback from volumetric flow meters etc. CIP solution distribution piping/circuits shall be designed in such a manner so as to maintain required velocity in the pipeline/up to the spray balls/nozzles. In return circuit suitable PIP type filter (duplex) with automatic changeover facility should be provided.

The CIP supply pumps shall be centrifugal type with sanitary design complete with motor. CIP return pumps shall be self-priming type with AISI 316 working/contact parts & to be provided at various locations to ensure effective cleaning of pipelines/equipment & tanks as per requirement. Common CIP return pump for rinse milk collection & storage tank is envisaged.

Distribution of CIP circuit & number of routes in the circuit shall be provided as per functional requirement.

Heating of solution would be done in THE (plate /Tubes MOC: **SS-316**, 0.5/0.6 mm thk., **frame cladded with SS-304 or Out side Tube SS304** , both side EPDM gasket, suitable for min. 20° C. delta T.) with steam heating control arrangement (PID type/ control valve of extended bonnet & isolated I/P converter) & condensate transfer through pumping traps.

Drain & overflow from all CIP tanks shall be connected to SS 304 header of adequate size and discharged to floor drainage channel. Similarly, drain from all return circuits shall be connected to separate SS 304 header of adequate size through a collection

funnel and discharged to floor drainage channel. All the CIP return lines shall have CT, flow switch & temp. transmitter for chemical recovery & functional requirement.

SS 304 platform made of dimpled/chequered plate, box section and stair case with skirting & pipe railing shall be provided for CIP kitchen.

Cleaning / Controls / Programme:

The CIP system shall generally comprise the following sequence:

Water prerinses for TS recovery

Rinse with recuperation water

Hot detergent circulation

Hot/Cold water rinse

Hot acid circulation

Hot/Cold water rinse

Hot water sterilization etc.

Bypassing of any operation after detergent circulation from the above sequence of programme shall be made possible. At the end of detergent and acid cleaning, the solution shall be recovered with the help of sensors (CTs) provided in the return line and sub-standard solution shall be automatically diverted to drain. Intermediate rinse shall be with plain hot/cold water, and this shall be recovered and re-used after acid circulation. The alkaline/acidic traces shall be removed with the help of cold/hot water. Hot water rinse shall ensure satisfactory cleaning of the lines and equipment. Final rinse water shall be recovered in the recuperation tank.

Concentration of detergent and acid shall be maintained with the help of an automatic dosing system equipped with necessary conductivity probes. Foam control arrangements shall be taken care in designing the system. Auto dosing shall take place in between successive cleaning cycles based on the strength of the solution measured by the conductivity meters installed on the lye/acid tanks. Duration of the re circulation of the solution shall be carried out such that the homogeneous strength of the solution is obtained.

Process CIP forward pump shall be **VFD** operated & forward flow rate (to be measured by suitable flow meters) would be controlled to meet variable requirement by varying pump speed without control valve, maintaining required pressure/velocity in pipelines. The CIP fluid shall be heated to required temp. in PHEs with the help of steam control valve. For maintaining uniform solution of desired concentration in each lye/acid tanks,

separate pump-based circulation system to be provided for all lye & acid solution tanks. Forward flow would commence only after required concentration & temp. is attained. Suitable flow meters would be required in each circuit to measure the forward flow rate during circulation. In each return line there should be flow switches for sensing blockage in the path & conductivity transmitters for recovery purpose. Temp. transmitters would also be required in each return circuit for monitoring return solution temp. The completion of CIP of every circuit shall be signaled with an audio-visual alarm in OS.

The temperature and concentration of cleaning solution shall be continuously monitored and corrected automatically. In case of non compliance of any of the parameters, the sequence shall remain suspended for such time and resume to "NORMAL" when corrected.

The route for CIP circulation shall be pre-programmed. The solution spray shall be through spray balls/turbines (high efficiency). CIP solution shall be returned back to CIP tanks through self-priming CIP return pumps in each route.

If the programme execution stops at particular step due to power failure or fault, then commencement of programme execution, after rectification, should start from the same step where the programme was terminated.

Sequence of operation with CIP parameters and detergent/acid consumption shall be automatically recorded in the process computer and shall be recalled on the screen on demand.

All water/air headers/distribution lines in CIP kitchen shall be of SS-

304. The steam header/distribution lines in the CIP kitchen shall be clad with SS-304 sheet of suitable gauge. All pneumatic air tubing at valve terminations, in CIP room shall be corrosion resistant. All supply- return lines for CIP should be insulated.

The system shall be fully automatic and pre-programmed with facilities of selecting and modifying the cleaning sequence and duration from the control room.

CIP Chemical receipt, storage & Dosing:

Bidder shall lay down the Concentrate Lye & Acid Dosing Line from Existing UHT processing Chemical Concentrate Storage section . Any Modification for Necessary Pipe and Fitting, Valves shall be provided by Bidder. For Electrical and Automation Control cabling and signal exchanges shall be carried out by the Bidder as per the battery limit.

Scope of Work – UHT (Fermented /Non fermented Milk Base Products /Juices) Processing Plant (30KLPD)

The project comprises the **design, engineering, supply, installation, testing, and commissioning** of a complete **30 TLPD UHT milk processing facility**, including provisions for:

- Installation of one 30KLPD UHT processing line.
- Aseptic Buffer storage facilities.
- Transfer of UHT-treated Products to the aseptic packaging section.
- Associated utility systems and automation.

The plant shall receive Products from Blending Section, sterilize it through UHT treatment, and transfer the product for aseptic packaging.

2. Process Scope

2.1 Processing System

This tender comprises design, engineering, supply, installation, testing & commissioning for Products such as (Flavoured Milk, Salted /Spices Butter milk, Sweet Lassi & Clear Juices) for UHT processing, with addition of Aseptic Storage Tank. Transfer of UHT Products to Aseptic packing Section, have to packed 30 KLPD. The Rinse Recovered from UHT shall be transferred to existing Rinse Recovery Section and other allied service requirements.

Input white milk Quality:

Dry matter content = 15%

Fat content = 1.5 % / 3% / 4.5%/6% (DTM, TM, Std. Milk & FCM) Milk
quality: 70% alcohol test

Below Products are Processed in New UHT Processing Plants.

Ingredient		
Fat / SNF%	Standardized milk	4.5/ 8.5%
	Toned milk	3.0/ 8.5%
	Double toned milk	1.5/ 9.0 %
	Full Cream Milk	6.0/9.0 %
	Acidity %LA	0.130%

UHT processed sweetened flavour milk

Ingredient	
Fat	3.1%
Milk TS	18.0%
Acidity %L.A.	0.14%
Sugar	6.75%

UHT processed Sweet Lassi

Ingredient	
Fat	3.1%
TS	21.5%
Acidity %L.A.	0.80%
Sugar	12%

UHT processed Salted / Spices Butter Milk

Ingredient	
Fat	1.6%
TS	6.5%
Acidity %L.A.	0.55%
Seasoning (contains 56% salt)	0.7%
Black Salt	0.1%
Total Salt	0.49%

UHT Chocolate Milk

Ingredient	
Fat	1.4%
TS	18.76%
Acidity %L.A.	0.20%
Cocoa Powder	0.7%
Sugar	9%

UHT Mango Beverage

Ingredient	
Mango Pulp	10.10%
TS	14.87%
Stabilizer	0.12%
Flavour & Color	0.23%
Sugar	12%

UHT Orange Beverage

Ingredient	
Orange Juice Conc.	1.80%
TS	13.37%
Stabilizer	0.12%
Flavour & Color	0.23%
Sugar	12%

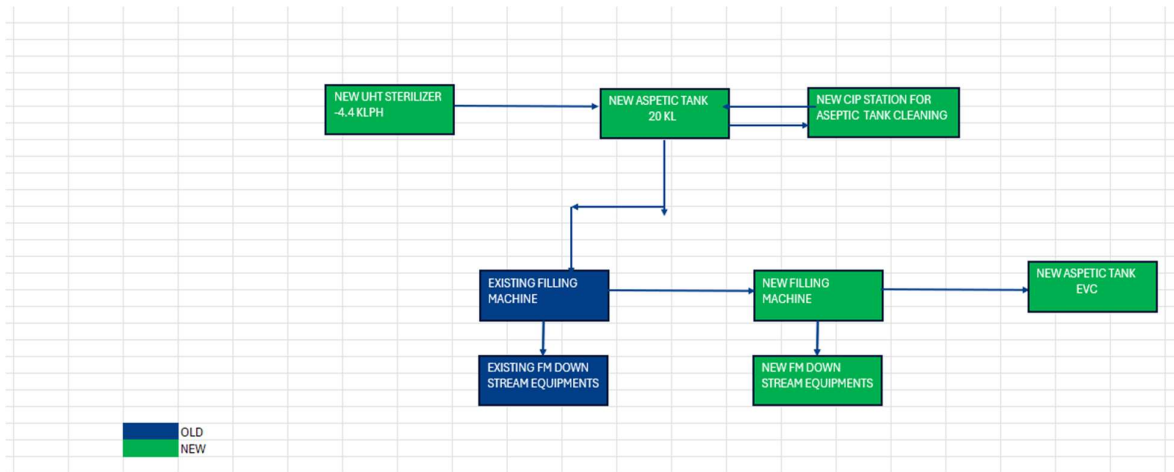
The sterilizer should be capable of producing milk based as well as juice-based products at the production rate of 4400 LPH. Regenerative section should be provided considering energy efficient design. Two stage homogenizers with max. working pressure of 250 bar should be provided. Flexibility should also be provided to connect homogenizer on up-stream as well as down-stream of Sterilizer holding coil (i.e. aseptic side as well as non-aseptic side). Protein stabilization tubes for necessary holding time (with manual bypass arrangement) should be provided.

A Sterile Buffer Tank (Aseptic Storage Tank) of 20 KL capacity is included in the scope of supply. This tank should be designed as pressure vessel and should be implosion proof as well. This tank shall act as a buffer storage between the upstream (sterilizer) and downstream equipment (aseptic filling machine). The Aseptic Tanks should have necessary Separate inlet / outlet for product, Agitator, Sterile Air, Cleaning, Sterilizing, Cooling Water etc. and outlet for Aseptic Packing Station. Generation of sterile air for Aseptic Storage Tank from compressed air supply is included in the scope. The tank should store product for minimum 72 hours in sterile condition. Valve cluster module with control panel for directing product flow, sterile air, cleaning liquids and steam should be supplied. Steam/Hot Condensate barriers should be provided at necessary points to avoid contamination from non-sterile area to sterile area.

Integration with external system:

The New Aseptic Tank 20 KL has Integration with Existing Filling Machine (SIG) 12000PPH (for 500ml and 1 Ltr family Pack) and New Filling machine as per bidder Scope. According to necessary Product Piping, Flow plates modification shall be done by part of the Bidder Scope.

As per Below details Basic Flow Porcess for Integration Scope.



Filling Machines (Existing)

Necessary communication in between Aseptic Tank & existing filling machines shall be carried out on Hardwired.

Communication exchange is only following:

Production Request Signals

Any software modification/Signal exchange required in existing system Purchaser Shall co-ordinate the Communication between New Aspetic Tank Supplier and Existing Equipment (Filling machine) Supplier. The Existing UHT Sterilizer integration with New Aspetic Filling Machine shall not part s this tender.

Water purging/pushing of all milk/Fermented /Juice transfer lines & solid recovery system shall be provided. Rinse water flushing (with soft water) of tanks /equipment / pipelines & recovery of the same in rinse milk collection tank should also be provided before CIP operations. Water push with soft water shall be volumetric flow meter/timer based & rinse milk recovery system should be conductivity transmitter based. Piping & automation system shall be provided as per the requirement. Fail Safe requirement is envisaged in scope of work. The Blending operations shall be normally performed, controlled & monitored from central control room. Other Operation shall be local HMIs/Panel for Sterilizer, Sterile Tank Panel, dedicated CIP system's for Aspetic Tank panel &HMI/Control panel of Filling Machine etc.

RINSE MILK RECOVERY & TRANSFER SYSTEM:

Rinse water flushing of all tanks/equipment/pipelines & recovery of the same in rinse recovery tank shall be provided before CIP operations. For the purpose, rinse milk recovery tank (3 KL capacity) including necessary transfer pumps, piping, valves, fittings etc. are included in the scope of the bid. The rinse milk recovery tank of 3 KL capacity shall be used to collect the pre-rinse milk to a pre-determined concentration/dilution (preprogrammed) from various milk / blending section pipelines, equipment and storage tanks over the day. Once the TS level goes below the preset level, the conductivity sensor mounted on the CIP return lines will sense it and automatically divert the rinse water to drain. The rinse milk flushing system shall be conductivity transmitter based before collection tank. The system shall be designed in such a way that flushing is completed with minimum quantity of water (to minimize dilution).

The system would be operated, monitored & controlled through plant automation system located in control room. A volumetric flow meter should be provided to measure & record the transfer quantity of rinse product recovery. Rinse product recovery of fermented milk-based products shall be transferred back to curd setting cum BM preparation tanks act as Blending Tanks for UHT Processing from rinse recovery tank of UHT section. Rinse product recovery of milk-based products (non-fermented) shall be transferred back to Blending Tanks.

Bidder shall note that the Blending Tanks and UHT Rinse Recovery Tanks are Common for Milk Based Fermented/ Non-Fermented and Juice Products. So, each day only one product shall be manufactured. During Product Changes from Fermented to Non-fermented or Juice Based Products CIP tanks for stations shall be completely drained and accordingly fresh water, Chemicals top up shall be done.

UTILITY DISTRIBUTION:**COMPRESSED AIR DISTRIBUTION SYSTEM:**

Compressed air Main header at one point available in the UHT section shall be provided by the purchaser. Isolation valve, air receiver & further distribution of compressed air up to all consumption points shall be in scope of this bid. Inter connection of compressed air piping with air distribution piping upto all the utilities of UHT section & Blending section is included in the scope of work. FR with moisture trap units to be installed at various consumption points.

All airline header & drops for distribution to all consumption points in the plant area shall be of SS-304 Sch10. For further distribution to individual valves/I-P converters, SS-304 distribution headers with SS ball valve at inlet & suitable pneumatic tubing (300-500 mm) with isolation valves to be considered for servicing

Measurement and recording of instrument air with totalizer shall be provided for total usage. The data shall be made accessible at the central control room. Air flow meters shall be Vortex type with pressure sensor & necessary transmitter for remote data logging of parameters. Necessary integration shall be made for taking feedback for Automation interface / MIS.

Necessary valves, piping, controls and instrument including flow meters, Pressure sensors, transmitters, pressure gauges etc. shall be in scope of supply.

The distribution network for compressed air shall be designed in such a way so as to maintain uniform required pressure at all consumption points to meet the flow rate without any hammering in pipeline. Drop in air pressure shall be signaled with an alarm in OS. Preferably the main ring system may be considered.

RAW, SOFT, RO DISTRIBUTION PIPING, VALVES, FITTINGS

Raw & soft water header at one point inside the UHT section shall be provided by the purchaser. Isolation valve, necessary filters & further distribution of raw & soft water up to all consumption points shall be in scope of this bid.

All raw water line header & drops for distribution to all consumption points in the plant area shall be of GI 'B' class with flow meter, Pressure transmitter, manual isolation (Ball/Butterfly) valves for servicing. All soft water line header & drops for distribution to all consumption points in the plant area shall be of SS-304 with flow meter, Pressure transmitter, manual isolation (Ball/Butterfly) valves for servicing.

All RO waterline header & drops for distribution to all consumption points in the plant area shall be of SS-304 with flowmeter, Pressure transmitter, manual isolation (Ball/Butterfly) valves for servicing.

Any Upgradation on Existing RO water Treatment plant and hydroflow system for new Blending and UHT processing same shall be provided by Purchaser.

STEAM PRESSURE REDUCING & DISTRIBUTION SYSTEM:

HP steam (10 Kg/Sq.cm) header available out side the UHT Building will be provided by the purchaser. Isolation valve & further distribution of HP & LP steam up to all consumption points, PRS shall be in scope of this bid. Steam flow meter shall be installed in the steam line for the UHT Section. Pressure Reducing Stations (PRSs) shall be installed at convenient location. PRV should be roboter type. Pressure on both sides of the PRS shall be monitored/recorded from plant automation system. All steam valves on high- & low-pressure lines shall be of piston/globe type. Supports for HP steam piping from steam tapping to PRSs shall be designed as per best industrial standards & practice to avoid stresses to piping & supports. HP steam piping shall have expansion bends/loops (if required), air vents, required number of steam trapping arrangements for condensate removal. Distribution of LP steam to all consumption points of the plant including UHT section is included in the scope of work. All LP distribution lines from the header shall have isolation valves at accessible locations. Separate PRV for UHT sterilizer is envisaged based on actual requirement ensuring trouble free efficient operation. The steam control valves shall have additional pneumatic ON/OFF valve with a solenoid valve in airline. Strainers should also be provided with insteam tapping for each consumption point.

CONDENSATE RECOVERY SYSTEM:

Maximum recovery & utilization of condensate from all consumption points shall be ensured through a system of pumping type float traps. The float traps shall be so selected/designed to ensure optimum operation of the system under suitable for quantity of condensate generated. Condensate discharged would be directed to condensate storage tank (in scope of another contractor) using SOPTs. The steam trap assembly for all process equipment's i.e. indirect type of Steam Heat Exchangers (Sterilizer, CIP section, etc.) shall be of pumping float type assembly.

For all steam headers/distribution lines, the steam trap shall be thermodynamic type of compact design. Wherever possible condensate from main steam headers/distribution lines would be recovered for utilization through TD type traps. Condensate recovery lines from all

collection points up to destination shall be with insulation & Al cladding. For Condensate Recovery Utilized Existing 3 KL Storage Tank. Bidder shall lay down this line up to existing condensate recovery line.

CHILLED WATER DISTRIBUTION SYSTEM:

Chilled water header (for supply & return) at one point inside the UHT section will be provided by the purchaser. Isolation valve (at main header & various tapings) & further distribution of chilled water (GI line, PUF insulated/Al cladded) up to all consumption points shall be in scope of this bid. The supply tapings shall also have strainers & pneumatic ON/OFF valves. For temperature control, PID valve with close loop control (TT based) is envisaged with a solenoid valve in the air line. Volumetric flowmeter & temp. transmitters for chilled water are required to be provided for measuring utility consumption & monitoring & logging in MIS. Chilled water return line (GI line, PUF insulated/Al cladded) will be with isolation valves at main return header & at various tapings. The return tapping shall also have NRVs & FS.

TOWER WATER DISTRIBUTION SYSTEM:

Cooling Tower Water one point inside the UHT section will be provided by the purchaser. Isolation valve & further distribution up to all consumption points shall be in scope of this bid. All waterline drops from header for distribution to all consumption points in the UHT section shall be of SS 304. Pressure & temp. transmitter, manual isolation (Ball/Butterfly) valves for servicing at main supply header is included in scope of work.

1.2 Deliverable Summary

The Supplier's responsibility is on a **turnkey basis**, covering:

1. Design & Engineering
2. Supply of Equipment
3. Utilities distribution & Services
4. Process & Utility Piping
5. Electrical & Instrumentation
6. Automation & MIS
7. Structural Works
8. Installation & Commissioning
9. Training
10. Statutory Compliance

Any item not specifically mentioned but necessary for safe, reliable, and efficient operation of the UHT plant shall be deemed included in the scope without additional cost.

DOCUMENTS TO BE SUBMITTED IN THE TECHNICAL BID:

1. Purchase order copy and commissioning report / performance report in support of supply of said machineries and installation during last two years.
2. The bidder should furnish Annual Sales Turnover and Profit & Loss statement of the last three financial years starting from 2023-2024, 2024-2025 & 2025-26.
3. The bidder shall furnish a copy of the Income Tax return for the financial year 2023-2024, 2024-2025 & 2025-26.
4. The bidder shall also provide their Permanent A/c No. Income Tax (PAN).
5. The bidder must submit copy of GST registration certificate.
6. The bidder must submit proof of all above otherwise tender will be rejected.
7. **Cost of tender paper & EMD shall be deposited through online portal at <https://tendersodisha.gov.in>.**
8. The bidder should enclose an undertaking with regards to non-black listing by any Govt. or Semi-Govt. or PSU or Cooperative institutions.

DOCUMENTS TO BE SUBMITTED IN THE COMMERCIAL BID:

- **The bidder shall submit their offer as per given BOQ format provided at online portal <https://tendersodisha.gov.in>.** The rate shall include freight, packing, forwarding, transit insurance, inclusive of GST / all taxes, duties, royalties etc.

Schedule-II

Delivery Schedule and delivery location:

The bidders must have to deliver the materials within 180 days after receipt of Purchase order copy.

Plant Manager,
OMFEDDairy,
Arilo-Govindpur,
Barang, dist.- Cuttack

Email: omfeddairy@omfed.com

Schedule-III

Bid Security (Earnest Money Deposit)

- The bid security is required to protect the purchaser against the risk of bidder's conduct, which would warrant the security's forfeiture. The Bidder shall furnish, as part of its bid, **bid security of Rs.50,00000/-to be deposited through online portal at <https://tendersodisha.gov.in>.**
- The EMD of the technically disqualified Bidders shall be returned after declaration of the list of such technically qualified Bidders in the portal. The EMD of other unsuccessful Bidders shall be refunded after signing of the Agreement with the Successful Bidder.
- The return of the EMD shall be in the form of bank transfer to the account of the Bidder through the e-procurement portal of the Government of Odisha.
- No interest will be paid on this deposit for the period during which the EMD is kept with OMFED.
- Co-Operatives, Govt. bodies, NSIC and MSME registered firms are exempted from submitting required EMD

PERFORMANCE SECURITY

- Within 15 days of receipt of the notification of award from the OMFED, the successful bidder shall furnish the performance security deposit @5% of the work order value, either in the form of a Bank guarantee valid for **15 months** from the expected date of completion of contract (as per the performance security form provided in the bidding document) or in the form of demand draft of required value in favour of OMFED, payable at Bhubaneswar.
- Failure of the successful bidder to comply with the above shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the OMFED may make the award to the next lowest evaluated bidder or call for new bids.

COMPLETION PERIOD:

- Twelve months from the date of issuance of Purchase Order.

VALIDITY OF OFFER:

- 90 days from the date of opening of commercial bid.

Schedule – IV

1. TERM & CONDITIONS

- In case the day of opening of tenders happens to be a holiday, the tenders will be opened on the next Working day.
- Suppliers are advised to visit site prior to bidding.
- The offer shall include taxes, duties, royalties, packing, forwarding, freight & transit insurance etc.
- Bidders are not allowed to stipulate any terms and condition of their own beyond the tender terms.
- The bidder has to inform in advance for pre-delivery inspection at its works.

2. Format and signing of bid

The E-procurement system procedure shall be adopted.

3. Submission of bids

The bid document shall be deposited through online portal at <https://tendersodisha.gov.in>.

4. Deadline for submission of bids

The bid documents shall be deposited online up to **2.00 PM** on **dt.22.09.2026** through online portal at <https://tendersodisha.gov.in>.

5. Late bids

No bids can be submitted after the deadline for submission through the e-procurement portal.

6. Modification and withdrawal of bids

- The E-procurement system procedure shall be adopted.
- The bidder may modify or withdraw its bid after the bid's submission prior to the deadline prescribed for submission of bids.
- No bid can be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity.

7. Opening of Bids by OMFED

The E-procurement system procedure shall be adopted.

The OMFED will open bids, at the online portal <https://tendersodisha.gov.in> on the scheduled date and time. Bidders' representatives who choose to attend, at the time and date specified in the Tender notice, may attend at the online portal <https://tendersodisha.gov.in>.

8. Clarification of bids

To assist in the examination, evaluation and comparison of bids the OMFED may, at its discretion, ask the Bidders for a clarification of its bid. The request for clarification and the response shall be in writing.

9. Preliminary Examination

The OMFED will examine the bids to determine whether they are complete, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

A bid determined as not substantially responsive will be rejected by the OMFED.

The OMFED may waive any minor informality or non-conformity or irregularity in a bid, which does not constitute a material deviation, provided such waiver, does not prejudice or affect the relative ranking of the Bidder.

10. AWARD CRITERIA

The OMFED will consider award of contract to the successful bidder whose bid have been determined to be substantially responsive and have been determined as the lowest evaluated bid, who is determined to be qualified to satisfactorily perform the contract.

11. OMFED'S Right to Accept Any Bid and to reject Any or All Bids

The OMFED reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for the OMFED'S action.

12. Notification of Award

- Within the period of bid validity, the OMFED will notify the successful bidder in writing by registered letter or by cable/ telex/ fax, (to be confirmed in writing by registered letter) that its bid has been accepted.
- The notification of award will constitute the formation of the contract.
- Upon the successful bidder's furnishing of performance security, the OMFED will promptly notify each unsuccessful bidder and will discharge its bid security.

13. Signing of Agreement

Within 15 days of receipt of the notification of award, the successful bidder shall prepare & sign the agreement, in the format provided in this bidding document, and send the same to the OMFED along with a duplicate copy. The original contract form shall be retained by the OMFED, & a duplicate copy of the same shall be sent to the Supplier, after it has been signed and dated.

3.0 Price basis:

3.1 For supply:

The quoted prices for the equipment shall be on FOR destination basis, inclusive of all taxes, including GST, packing & forwarding charges, transportation, insurance and other incidental charges, loading & unloading charges etc. as applicable. The bidder shall, however, provide a break-up of the prices quoted.

Bidders are required to give break up of unit rates & quantities of each & all items to be supplied for the purpose of the contract.

3.2 For erection/installation, testing, commissioning, trial run & handing over:

Bidders shall submit separate rates for complete installation, testing and commissioning, including satisfactory performance trial run for 10 days.

Prices quoted should be on FOR destination basis, inclusive of all taxes & duties, packing & forwarding charges, transportation, insurance and other incidental charges, loading & unloading charges etc. as applicable. The Supplier shall be responsible for supply of all sundries / power / fuel as may be required for erection, testing, commissioning & performance trial run for 10 days, including oil and lubricants. However, electrical/ fuel charges during the 10 days period of performance trial run shall be borne by OMFED.

The Supplier shall have to create their own storage space for all the equipments & materials and provide watch & ward for it. Insurance of equipments & materials during storage, shifting, installation & testing shall be Supplier's responsibility.

4.0 Cost of Bidding

The Bidder shall bear all costs associated with the preparation and submission of its bid, and the Orissa State Cooperative Milk Producers' Federation Limited, hereinafter referred to as "THE OMFED", will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

B. THE BIDDING DOCUMENTS

5.0 CONTENT OF BIDDING DOCUMENTS

5.1 The Bidder is expected to examine all instructions, forms, terms and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive to the bidding documents in every respect will be at the bidder's risk and may result in the rejection of its bid.

6.0 Clarification of Bidding Documents

A prospective Bidder requiring any clarification of the Bidding Documents may notify the OMFED in writing or by Fax or Cable at the OMFED'S mailing address indicated in this document. The OMFED will respond in writing to any request for clarification of the bidding Documents which it receives not later than 15 days prior to the deadline for the submission of bids prescribed by the OMFED. Written copies of the OMFED'S response (including an explanation of the query but without identifying the source of inquiry) will be sent to all prospective Bidders which have received the bidding Documents, and will be attached to the Bidding Documents sold subsequently.

7.0 Amendment of Bidding Documents

- 7.1 At any time prior to the deadline for submission of bids, the OMFED may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by amendment.
- 7.2 The amendment will be notified in writing or by Fax or cable to all prospective Bidders, which have received the Bidding Documents and will be binding on them. The amendment will be attached to the bidding documents sold subsequently.
- 7.3 In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the OMFED may, at its discretion, extend the deadline for the submission of bids.

8.0 Bid Prices

The bidder shall consider the Bid prices of the goods it proposes to supply under the Contract, on FOR destination basis, inclusive of all taxes & duties, packing & forwarding charges, transportation, insurance and other incidental charges, loading & unloading charges etc. as applicable. **It is not mandatory on the part of OMFED to procure all the items and quantity as mentioned in the bills of quantity.**

Bidders shall provide the break-up of their offered prices separately in the following manner (when asked after opening of tender).

- (i) The price of the goods, quoted ex-factory, ex-showroom, ex-warehouse or off-the-shelf, as applicable, including all duties / GST and other taxes already paid or payable:
 - On the components and raw material used in the manufacture or assembly of goods quoted ex-factory;
 - Or
 - The price of the goods, quoted ex-factory, ex-showroom, ex-warehouse or off-the-shelf, as applicable, including all duties and sales other taxes already paid or payable on the imported goods of foreign origin quoted ex-showroom, ex-warehouse or off-the-shelf.
- (ii) Any other taxes applicable in India which will be payable on the goods if this contract is awarded;
- (iii) Charges for packing and forwarding, inland transportation, insurance and other costs incidental to delivery of the goods to their final destination; and

(iv) The cost of all incidental services required under the contract.

The bidder's separation of price components in accordance with Para. 10.2 above will be solely for the purpose of facilitating the comparison of bids by the OMFED.

9.0 Fixed Price

Prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A bid submitted with an adjustable price basis for such goods and services will be treated as non-responsive and rejected, pursuant to clause

10.0 Water for installation:

Water shall be provided by the purchaser at one point within site. Distribution of waterlines from there onward shall be in the scope of bidder. Water for installation and plant testing shall be provided free of charge.

11.0 Electricity for installation:

Bidder to arrange the electricity on its own through their DG set. Bidder shall be responsible for supply & distribution of power for site fabrication, lighting etc. However, if electrical power is provided by the purchaser, recovery shall be made @0.5% of the total purchase order value. The bidder will ensure safe operation of delicate electronic equipment used during construction, such a sorbital welding machine, testing devices etc. to protect against damage from mains supply. In the event of a major power failure in the system, it shall be the responsibility of the Bidder to hire a diesel generator if this proves to be necessary.

SECTION -III.

GENERAL CONDITIONS OF CONTRACT

1. Definitions

1.1 In this contract, the following terms shall be interpreted as indicated.

- (a) "The contract" means the agreement entered into between the OMFED and the Supplier, as recorded in the contract form signed by the parties, including the notification of award, all attachments and appendices thereto and all documents incorporated by reference therein;
- (b) "The contract price" means the price payable to the Supplier under the contract for the full and proper performance of its contractual obligations;
- (c) "The goods" means all of the equipment, machinery, and/or other materials which the Supplier is required to supply to the OMFED under the contract;
- (d) "Services" means services ancillary to the supply of the goods, such as transportation and insurance, and any other incidental services, such as installation, testing, commissioning, performance trial run for 30 days, provision of technical assistance, training and other such obligations of the Supplier covered under the contract;
- (e) "The OMFED" means the organization purchasing the goods and services under the contract i.e. ORISSA STATE COOPERATIVE MILK PRODUCERS' FEDERATION LTD.
- (f) "The Supplier" means the individual(s) or firm(s) supplying the goods under this contract i.e., with which an agreement has been signed by the OMFED for supply of goods & services required elsewhere in this document.

2. APPLICATION

These general conditions shall apply to the extent that they are not superseded by provisions in other parts of the contract.

3. STANDARDS

The quality standard with ISI / BIS/ any other recognized standard shall be preferred.

The goods supplied under this contract shall conform to the standards mentioned in the technical specifications, and, when no applicable standard is mentioned, to the Indian standards.

Wherever reference is made in the contract to the respective standards and codes in accordance with which goods and materials are to be furnished, and work is to be performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect on the date of signing of agreement shall apply, unless otherwise expressly set forth in the contract.

4. Use of Contract and Information

- 4.1 The Supplier shall not, without the OMFED'S prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the OMFED in connection therewith, to any

person other than a person employed by the Supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

- 4.2 The Supplier shall not, without the OMFED'S prior written consent, make use of any document or information enumerated in para.4.1 except for purposes of performing the contract.
- 4.3 Any document, other than the contract itself, enumerated in Para. 4.1 shall remain the property of the OMFED and shall be returned (in all copies) to the OMFED on completion of the Supplier's performance under the contract if so required by the OMFED.

5. PATENT RIGHTS

The Supplier shall indemnify the OMFED against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the goods/services or any part thereof in India.

6.0 PERFORMANCE SECURITY

- 6.1 Within 15 days of the Supplier's receipt of notification of award of the contract, the Supplier shall furnish **performance security to the OMFED in the amount of 5% of the contract value, in accordance to clause 31 of the instruction to bidders.**
- 6.2 The proceeds of the performance security shall be payable to the OMFED as compensation for any loss resulting from the Supplier's failure to complete its obligations under the contract.
- 6.3 The performance security shall be denominated in Indian rupees and shall be in the following form:
 - a) A Bank guarantee, issued by a Nationalised Bank in India, and in the form provided in the bidding documents.
 - b) Demand draft in favour of "Orissa State Co-operative Milk Producers' Federation Limited" payable at Bhubaneswar.

Such Bank guarantee shall be valid upto three months after the expiry of the warranty / guarantee period.

- 6.4 The performance security will be discharged by the OMFED and returned to the Supplier not later than 90 days following the date of completion of the Supplier's performance obligations, including any warranty / guarantee obligations, under the contract.
- 6.5 No interest shall be paid on the performance security deposit by the OMFED.

7. Inspection and Tests

- 7.1 The OMFED or its representative shall have the right to inspect and/or test the goods to confirm their conformity to the contract. The Technical Specifications shall specify what inspections and tests the OMFED shall notify the Supplier in writing of the identity of any representatives, if retained for these purposes.
- 7.2 The inspection of the goods shall be carried out to check whether the goods are in conformity with the technical specifications and shall be in line with the inspection/test procedures laid down in the schedule of specifications and the contract conditions.
- 7.3 The inspections and tests may be conducted on the premises of the Supplier or its subSupplier(s) / at point of delivery and/or at the good's final destination. Where conducted on the premises of the Supplier or its subSupplier(s) / all reasonable facilities

and assistance including access to drawings and production data, shall be furnished to the inspectors at no charge to the OMFED. In case of any defects or deficiency notified by the OMFED'S inspection authority, the Supplier will rectify and make good the same without delay and not proceed further processing of such items(s) of goods without obtaining approval from the inspection authority.

- 7.4 Should any inspected or tested goods fail to conform to the specifications/ the OMFED may reject them and the Supplier shall either replace the rejected goods or make all alterations necessary to meet specification requirements free of cost to the OMFED.
- 7.5 The OMFED'S right to inspect, test and, where necessary, reject the goods after the goods' arrival at destination shall in no way be limited or waived by reason of the goods having previously been inspected, tested and passed by the OMFED or its representative.
- 7.6 Nothing in clause 7 shall in any way release the Supplier from any warranty or other obligations under this contract.

8. Packing and Marking

- 8.1 The Supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to temperature, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit & destination.
- 8.2 The packing, marking and documents within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, required by law, and, subject to clause 18, in any subsequent instructions ordered by the OMFED.
- 8.3 Each package shall be marked to indicate:
 - a) Name of the Supplier
 - b) Details of items in the package
 - c) Name of the consignee
 - d) Order number
 - e) Gross/net and tare weights of the item
 - f) Destination

9. Delivery and documents

- 9.1 Delivery of the goods shall be made by the Supplier for destination, by road.
- 9.2 The following documents shall be provided by the Supplier / Supplier:

Original and three copies of:

- (i) The Supplier's invoice showing order no. Goods description, quantity, unit price, total amount;
- (ii) Delivery note/packing list/lorry receipt;
- (iii) Manufacturer's/Supplier's guarantee certificate;
- (iv) Inspection certificate issued by the nominated inspection agency, and the Supplier's factory inspection report;

- (v) Insurance policy;
- (vi) Excise gate pass/octroi receipts, wherever applicable, duly sealed indicating payments made; and
- (vii) Any other document evidencing payment of statutory levies.

Note: The nomenclature used for the item description in the invoice/s, packing list/s and delivery note/s etc. should be identical to that used in the order. The dispatch particulars including name of transporter, LR no. and date should also be mentioned in the invoice/s.

10. Insurance:

10.1 For supply of equipments:

The manufacturer shall have to arrange **all transit risk insurance warehouse to warehouse basis**, including strike clauses, for an amount equal to 110 % of the FOR destination value of the Goods, valid for a period of not less than 3 months after the expected date of arrival of Goods at destination.

In the event of any damage to/loss of consignment in transit, it will be your responsibility to lodge necessary claims with the carriers/ underwriters and pursue them till settlement. Since the insurance policy will be in our name, if required, we shall give you necessary authorisation letter authorizing you to lodge and pursue claims on our behalf with the carriers/ underwriters. Also you shall have to make good the losses/ damages occurred in transit by making replacement /payment to us in the first instance and if claims are settled by the underwriters and any amounts are realized by us, the amounts thus realized in settlement of claims shall be reimbursed to you. In other words, the prima facie responsibility rests on you for getting compensation of the damage/losses incurred if any, due to all transit hazards.

10.2 During storage at site:

The Supplier shall arrange for insurance of all items stored/ received at the site including the items of supply covered under this contract& the Supplier shall furnish necessary details of such insurance to the OMFED, on demand. Any default on the part of the Supplier due to which any item does not get covered under insurance; the consequential losses shall be charged to the Supplier.

The Supplier shall arrange for insurance of all the items brought by him to the site for use during the execution of the contract, till handing over of the complete job.

11. Transportation

The Supplier is required to deliver the Goods FOR Destination, by road. Transport of the goods to the destination shall be arranged through a reputed and Bank approved transporter having local offices at destination and Bhubaneswar, and shall be paid for by the Supplier.

12. Incidental services

12.1 The Supplier is required to provide the following services:

- a) Performance of on-site assembly, installation, hooking-up to existing system, Start-up, testing, commissioning, performance trial run for a period of 30 days and handing over of the supplied goods;
 - b) Furnishing of tools & tackles required for assembly and maintenance of the supplied goods;
 - c) Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods;
 - d) Operation, maintenance and repair of the supplied goods for a period of 30 days, provided that this service shall not relieve the Supplier of any warranty obligations under this contract; and
 - e) Conduct of training of the OMFED'S personnel, on-site, in assembly, start-up operation, maintenance and repair of the supplied goods, if required.
- 12.2 Prices charged by the Supplier for the preceding incidental services are to be included in the price of the contract.

13. Spare parts

- 13.1 The Supplier may be required to provide any or all of the following materials and notifications pertaining to spare parts manufactured or distributed by the Supplier:
- a) Such spare parts as the OMFED may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under the contract; and
 - b) In the event of termination of production of the spare parts:
 - (i) Advance notification to the OMFED of the pending termination, in sufficient time to permit the OMFED to procure its needed requirements; and
 - (ii) Following such termination, furnishing at no cost to the OMFED, the blueprints, drawings and specifications of the spare parts, if and when requested.
- 13.2 Suppliers shall carry sufficient inventories to assure ex-stock supply of consumable spares such as gaskets, plugs, washers, belts, etc. other spare parts and components shall be supplied as promptly as possible but in any case within six months of placement of order.
- 13.3 The obligation of Supplier stated in Para 13.1 shall continue even after expiry of the contract.

14. Warranty / guarantee

- 14.1 The Supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the contract. The Supplier further warrants that the goods supplied under this contract shall have no defect arising from design, material or workmanship or from any act or omission of the Supplier that may develop under normal use of the supplied goods in the conditions. The Supplier also guarantees that the goods supplied shall perform satisfactorily as per the designed/rated/ installed capacity as provided for in the contract.
- 14.2 This warranty / guarantee shall remain valid for 12 months after the goods, or any portion thereof as the case may be, have been delivered, commissioned & handed over to the OMFED after the performance of 30 days trial run period.

- 14.3 The OMFED shall promptly notify the Supplier in writing of any claims arising under this warranty.
- 14.4 Upon receipt of such notice, the Supplier shall, with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the OMFED.
- 14.5 If the Supplier, having been notified, fails to remedy the defects(s) within a period of 30 days, the OMFED may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the OMFED may have against the Supplier under the contract.
- 14.6 This warranty/ guarantee shall not cover any damage/s resulting from normal wear and tear or improper handling by the OMFED or his authorised representatives.

15. Terms of payment For Mechanical equipments.

15.1 For Supply of Equipment.

- 30% advance with signing of technically and commercially clear contract for supply
- 60% balanced payment along with 100% GST against successful installation & commissioning of the plant.
- 10% based on performance bank guarantee of 1 year.

15.2 For Erection component.

Payment in full shall be released after successful installation/ commissioning.

16. Fixed prices

Prices charged by the Supplier for goods delivered and services performed under the contract shall not, vary from the prices quoted by the Supplier in its bid.

17. Change orders

- 17.1 The OMFED may, at any time, by a written order given to the Supplier, make changes within the general scope of the contract in any one or more of the following:
- (a) Drawings, designs or specifications, where goods to be furnished under the contract are to be specifically manufactured for the OMFED;
 - (b) The method of shipment or packing;
 - (c) The place of delivery; or
 - (d) The services to be provided by the Supplier.
- 17.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any part of the work under the contract, whether changed or not changed by the order, an equitable adjustment shall be made in the contract price or delivery schedule, provided that such claims by Supplier are reasonable & to the satisfaction of the OMFED. Any claims by the Supplier for adjustment under this clause must be asserted within thirty (30) days from the date of the Supplier's receipt of the OMFED's change order.

18. Contract Amendment

Subject to clause 17, no variation in or modification of the terms of the contract shall be made except by written amendment signed by the OMFED.

19. Assignment

The Supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the OMFED'S prior written consent.

20. Subcontracts

The Supplier shall notify the OMFED in writing of all subcontracts awarded under the contract if not already specified in his bid, such notification, in his original bid or later, shall not relive the Supplier from any liability or obligation under the contract.

21.0 Delays in the Supplier's performance

21.1 Deliveries in the goods and performance of services shall be made by the Supplier in accordance with the time schedule specified by the OMFED, in Section –I of the bidding documents.

21.2 An unexcused delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to any or all of the following sanctions: - forfeiture of its performance security, imposition of liquidated damages, and/ or termination of the contract for default.

21.3 If at any time during performance of the contract, the Supplier or its subSupplier(s) should encounter conditions impeding timely delivery of the goods and performance of services. The Supplier shall promptly notify the OMFED in writing of the fact of the delay, its likely duration and its cause (s). As soon as practicable after receipt of the Supplier's notice, the OMFED shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be notified to the Supplier by amendment of the contract.

22.0 Time for completion

Subject to any requirement in the contract as to completion of any section of the works before completion of the whole, the whole of the works shall be completed, within the stipulated time stated in section–II of the bidding documents or such extended time as may be allowed under clause 23 hereof.

23.0 Extension of Time of Completion

Should the amount of extra or additional work of any kind or any cause of delay referred to in these conditions, or exceptional adverse climatic conditions, or other special circumstances of any kind whatsoever which may occur, other than through a default of the Supplier, be such as fairly to entitle the Supplier to an extension of time for the completion of the works. OMFED shall determine the amount of such extension and shall notify the Supplier accordingly. Provided that the OMFED is not bound to take in account any extra or additional works or other special circumstances unless the Supplier has within thirty days after such work has been commenced, or such circumstances have arisen, or as soon thereafter as is practicable, submitted to the engineer full and detailed particulars of any extension of time to which he may consider himself entitled in order that submission may be investigated at the time.

24.0 Penalty for Delay

- 24.1 If the Supplier shall fail to achieve completion of the works within the specified time, then the Supplier shall pay to the OMFED the sum at the rate of 0.5 % (half percent) of the total value of work done under the contract, as a penalty, for every week or part of the week which shall elapse, between the time prescribed & the date of certified completion of the work. The OMFED may without prejudice to any other method of recovery, deduct the amount of such penalty from any payment in its hands, due or which may become due to the Supplier. The payment or deduction of such penalty shall not relieve the Supplier from obligations to complete the works, or from any other of his obligations and liabilities under the contract.
- 24.2 The aggregate maximum of the penalty for delay payable to the OMFED under this clause shall be subject to a maximum of 5% of the total value of work.
- 24.3 The criteria for deriving the penalty for delay shall be the actual value of works executed and the amended time of completion.
- 24.4 Any incremental taxes and levies due to the delay in the performance of the contract by the Supplier shall be to the Supplier's account.

25. Termination for default

- 25.1 The OMFED may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the contract in whole or in part,
- (a) If the Supplier fails to delivery an or all the goods within the time period (s) specified in the contract, or any extension thereof granted by the OMFED pursuant to clause 17, 21, & 22;
- Or
- (b) If the Supplier fails to perform any other obligation(s) under the contract.
- 25.2 In the event the OMFED terminates the contract in whole or in part, pursuant to Para. 25.1, the OMFED may procure, upon such terms and in such manner, as it deems appropriate, goods similar to those undelivered, and the Supplier shall be liable to the OMFED for any excess costs for such similar goods. However, the Supplier shall continue performance of the contract to the extent not terminated.
- 25.3 Consequent to such termination of contract, the OMFED shall recover the advance paid, if any, to the Supplier along with interest @ 18% per annum compounded quarterly on the last day of March, June, September and December on the advance paid for the entire period for which the advance was retained by the Supplier.

26. Force Majeure

- 26.1 Notwithstanding the provisions of clauses hereof, the Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extend that, its delay in performance or other failure to perform its obligations under the contract is the result of an event of force majeure.
- 26.2 For purposes of this clause, "force majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the OMFED either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

- 26.3 If a force majeure situation arises, the Supplier shall notify the OMFED in writing of such condition and the cause thereof, within 7 days. Unless otherwise directed by the OMFED in writing, the Supplier shall continue to perform its obligations under the contract as far as is reasonably practical and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

27.0 Termination for Insolvency

The OMFED may at any time terminate the contract by giving written notice to the Supplier, without compensation to the Supplier, if:

- (a) The Supplier becomes bankrupt or otherwise insolvent,
 - (b) The Supplier being a company is wound up voluntarily by the order of a court receiver, liquidator or manager appointed on behalf of the debenture holders or circumstances shall have arisen which entitle the court or debenture holders to appoint a receiver, liquidator or a manager,
- Provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the OMFED.

28.0 Termination for Convenience

- 28.1 The OMFED, may by written notice sent to the Supplier, terminate the Supplier, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is of the OMFED'S convenience, the extent to which performance of work under the contract is terminated, and the date upon which such termination becomes effective.
- 28.2 The goods that are complete and ready for shipment within 30 days after the Supplier's receipt of notice of termination shall be purchased by the OMFED at the contract terms and prices. For the remaining goods, the OMFED may elect:
- (a) To have any portion completed and delivered at the contract terms and prices; and /or
 - (b) To cancel the remainder and pay to the Supplier an agreed amount for partially completed goods and for material and parts previously procured by the Supplier.

29.0 Settlements of Disputes

- 29.1 If the Supplier considers any work demanded of him to be outside the requirements of the contract, or considers any drawings, record or ruling of the engineer on any matter in connection with or arising out of the contract or the carrying out of the work to be unacceptable, he shall promptly ask the engineer in written instructions or decision. There upon the engineer shall give his written instructions or decision within a period of fifteen days of such request.
- 29.2 Upon the receipt of the written instructions or decisions the Supplier shall promptly proceed without delay to comply with such instructions or decisions.
- 29.3 If the engineer fails to give his instructions or decisions in writing within a period of fifteen days after being requested, or if the Supplier is dissatisfied with the instructions and decisions, he shall appeal to the OMFED, which shall afford an opportunity to the Supplier to be heard and to offer an evidence in support of his appeal. The OMFED shall give a decision within a period of thirty days after the Supplier has given the said evidence in support of his appeal.
- 29.4 If the Supplier is dissatisfied with this decision, the Supplier within a period of thirty days from the receipt of the decisions shall indicate his intension to refer the dispute to arbitration, failing which the said decision shall be final and conclusive.

30.0 Arbitration

All disputes or differences in respect of which the decision is not final and conclusive shall, on the initiative of either party, be referred for adjudication as per the Arbitration And Conciliation Act 1996

31.0 Applicable law

The contract shall be interpreted in accordance with the laws of the union of India.

32. Notices

32.1 Any notice given by one party to the other pursuant to the contract shall be sent in writing or by telegram/ fax/ cable and confirmed in writing to the address specified for that purpose in the special conditions of contract.

32.2 A notice shall be effective when delivered or on the notice's effective date, which ever is later.

33. 0 Taxes and Duties

The Supplier shall be entirely responsible for all taxes, duties, license fees etc. incurred until handing over of the Supplier goods and services to the OMFED. All Government fees paid for inspections and approvals by statutory authorities shall be reimbursed by the OMFED on production of copy of treasury Challan for same. Service charges for depositing the govt. fees or submission of requisite forms with the statutory authorities shall be not being admissible.

20.0 Right of use defective equipment

If after handing over of the equipments and within the guarantee and warranty period, the operation or use of the equipment(s) proves to be unsatisfactory, the OMFED shall have the right to continue to operate or use such equipment

Until rectifications of defects errors or omissions by repair or partial or complete replacement is made, without interfering with the OMFED'S operation.

21.0 Jurisdiction

For the settlement of any dispute arising out of the contract against this bid, only the courts at Bhubaneswar only shall have jurisdiction to entertain the same.

SECTION-IV

SPECIAL CONDITIONS OF CONTRACT

ERECTION & COMMISSIONING OF EQUIPMENT

1.0 Sufficiency of Tender

The Supplier by bidding shall be deemed to have satisfied himself as to all the conditions and circumstances affecting the contract price, as to the possibility of executing the works as shown and described in the contract, as to the general circumstances at the site of the works, as to the general labour position at site, and to have determined the prices accordingly.

2.0 Programme of installation and commissioning.

Within 30 days of receipt of letter of acceptance of the bid, the Supplier shall submit to the OMFED for approval a comprehensive programme in the form of PERT Network / bar chart and any other form as may be required by the OMFED showing the sequence of order in which the Supplier proposes to carry out the works including the design, manufacture, delivery to site, erection, hooking-up, commissioning, trial run & hand-over, thereof. After submission to and approval by the OMFED of such programme, the Supplier shall adhere to the sequence of order and method stated therein. The submission to and approval by the OMFED of such programme shall not relieve the Supplier of any of his duties or responsibilities under the contract. The programme approved by the OMFED shall form the basis of evaluating the pace of all works to be performed by the Supplier. The Supplier shall update the PERT network every month, submit it to the OMFED and shall inform the OMFED the progress on all the activities falling on schedule for the next reporting date.

3.0 Preparations of drawings for approval

The Supplier should visit the site to acquaint himself in respect of existing site conditions and to know the details/ information required for understanding the nature and type of civil construction works involved in the project.

The Supplier shall submit to the OMFED for approval:

- a) Within the time given in the specification or in the programme, such drawings, samples, patterns and models as may be called for therein, and in numbers therein required.
- b) During the progress of works and within such reasonable times as the OMFED may required such drawings of the general arrangement and detailed of the works as the OMFED may require.

The specifications/conditions concerning the submission of drawings by the Supplier are detailed as under:

Within four weeks from the date of receipt of the order, Supplier shall furnish all necessary drawings, in three sets, (as briefly described below) for approval, identifying each drawing by a serial number and descriptive title. The list given below may be revised and extended if necessary, during the progress of work depending on the nature of the contract also.

The OMFED shall signify his approval or disapproval of all drawings or such drawings that would affect progress of the contract as per the agreed programmer.

Brief list of drawings:

- i) Equipment drawings for fabricated items.
- ii) Service piping layout in production and service blocks.
- iii) Electrical cable, conduit/cable tray layout.
- iv) Other miscellaneous drawings as required for erection work.

Drawings showing fabrication details, dimensions, layouts and bill of materials submitted for approval shall be signed by responsible representative of Supplier and shall be to any one of the following sizes in accordance with Indian standards: AO, A1, A2, A3, and A4.

All drawings shall show the following particulars in the lower right hand corner in addition to Supplier's name:

- i) Name of the OMFED
- ii) Project title
- iii) Title of drawing
- iv) Scale
- v) Date of drawing
- vi) Drawing number
- vii) Space for OMFED'S drawing number.

In addition to the information provided on drawings, each drawing shall carry a revision number, date of revision and brief description of revision carried out. Whenever any revision is carried out, correspondingly revision number must be up-dated.

All dimensions on drawings shall be in Metric Units.

Drawings (**three sets**) submitted by the Supplier for approval will be checked, reviewed by the OMFED, and comments, if any, on the same will be conveyed to the Supplier. It is the responsibility of the same Supplier to incorporate correctly all the comments conveyed by the OMFED on the Supplier's drawing. The drawings which are approved with comments are to be resubmitted to the OMFED for purpose of records. **Such drawing will not be checked / reviewed by the OMFED to verify whether all the comments have been incorporated by the Supplier.** If the Supplier is unable to incorporate any comments in the revised drawings, Supplier shall clearly state in his forwarding letter such non-compliance along with the valid reasons.

Drawing prepared by the Supplier and approved by the OMFED shall be considered as a part of the specification. However, the examination of the drawings by the OMFED shall not relieve the Supplier of his responsibility for engineering design, workmanship, and quality of materials, warranty obligations and satisfactory performance of equipments, services & installation covered under the contract.

If at any time before completion of the work, changes are made necessitating revision of approved drawings the Supplier shall make such revisions and proceed in the same routine as for the original approval.

4.0 Operation and maintenance manual:

The Supplier shall furnish to the OMFED before the works are taken over, operating and maintenance instruction together with drawings of the works as completed, in sufficient detail to enable the OMFED to maintain, dismantle, reassemble and adjust all parts of the works, unless otherwise agreed, the works shall not be considered to be completed for the purposes of taking over until such instruction and drawing have been supplied to the OMFED.

5.0 Supplier's superintendence and deployment of erection team and conduct of personnel

The Supplier shall employ one or more competent representatives, whose name or names shall have previously been communicated in writing to the OMFED by the Supplier, to superintend the carrying out of the works on the site. The said representative or if more than one shall be employed, then one of such representatives shall be present on the site during all times, and any orders or instructions which the OMFED may give to the said representative of the Supplier shall be deemed to have given to the Supplier.

The said representative shall have full technical capacities and complete administrative and financial powers to expeditiously and efficiently execute the work under the contract.

The Supplier shall, execute the works with due care and diligence within the time for completion and employ Supplier's team comprising qualified and experienced engineers together with adequate skilled, semi-skilled and Unskilled workmen in the site for carrying out the works. The Supplier shall ensure adequate work force to keep the required pace at all times as per the schedule of completion. The Supplier shall also ensure availability of competent engineers during commissioning / start up, trial runs, operation of the plant / equipment till handing over of the plant.

The Supplier shall furnish the details of qualifications and experience of their senior supervisors and engineers assigned to the work site, including their experience in supervising erection and commissioning of plant and equipment of comparable capacity.

When the Supplier or his representative is not present on any part of the work where it may be desired to give directions in the event of emergencies, orders may be given by the OMFED and shall be received and observed by the supervisors or foremen who may have charge of the particular part of the work in reference to which orders are given. Any Such instructions, directions or notices given by the OMFED shall be deemed to have been given to the Supplier.

The Supplier shall furnish to the OMFED a fortnightly labour force report showing by classifications the number of employee engaged in work. The Suppliers' employment records shall include any reasonable information as may be required by the OMFED. The Supplier should also display necessary information as may be required by statutory regulations, and shall comply with all statutory obligations as required under the prevailing rules of the state & country.

None of the Supplier's supervisors, engineers, or labourers may be withdrawn from the work without notice to the OMFED and further no such withdrawals shall be made if in the opinion of the OMFED, it will adversely affect the required pace of progress and / or the successful completion of the work.

The OMFED shall be at liberty to object to any representative or person, skilled, semi-skilled or unskilled worker employed by the Supplier in the execution of or otherwise about the works who shall in the opinion of the OMFED, misconduct himself or be incompetent, or negligent or unsuitable, and the Supplier shall remove the person so objected to upon receipt of notice in writing from the OMFED and shall provided in that place a competent representative at Supplier's own expense within a reasonable time.

In the execution of the works no persons other than the Supplier, sub-Supplier and their employees shall be allowed on the site except by written permission of OMFED.

6.0 OMFED'S Instructions

The OMFED may in his absolute discretion, issue from time to time drawings and/or instructions, directions and clarifications which are collectively referred to as OMFED's instructions in regard to:

Any additional drawing and clarifications to exhibit or illustrate details.

Variations or modifications of the design, quality or quantity of work or additions or omissions or substitution of any work.

Any discrepancy in the drawings or between the schedule of quantities and/or specifications.

Removal from the site of any material brought there by the Supplier, which are unacceptable to the OMFED and the substitution of any other material thereof. Removal and/or re-execution of any work erected by the Supplier, which are unacceptable to the OMFED.

Dismissal from the work of any persons employed there upon who shall in the opinion of the OMFED, misconduct himself, or be incompetent or negligent.

Opening up for inspection of any work covered up.

Amending and making good of any defects.

7.0 Rights of the OMFED

7.1 Rights to direct works:

The OMFED shall have the right to direct the manner in which all works under this contract shall be conducted, insofar as it may be necessary to secure the safe and proper progress and specified quality of the works. All work shall be done and all materials shall be furnished to the satisfaction and approval of the OMFED.

Whenever in the opinion of the OMFED, the Supplier has made marked departures from the schedule of completion or when circumstances or requirement force such a departure from the said schedule, the OMFED, in order to ensure compliance with the schedule, shall direct the order, pace and method of conducting the work, which shall be adhered to by the Supplier.

If in the judgment of the OMFED it becomes necessary at any time to accelerate the overall pace of the plant erection work, the Supplier, when directed by the OMFED, shall cease work at any particular point and transfer Supplier's men to such other point or points and execute such works, as may be directed by the OMFED and at the discretion of the OMFED.

7.2 Right to order modifications of methods and equipment

If at any time the Supplier's methods, materials or equipment appear to the OMFED to be unsafe, inefficient or inadequate for securing the safety of workmen or the public, the quality of work or the rate of progress required, the OMFED may direct the Supplier to ensure safety, and increase their efficiency and adequacy and the Supplier shall promptly comply with such directives. If at any time the Supplier's working force and equipment are inadequate in the opinion of the OMFED, for securing the necessary progress as stipulated, the Supplier shall if so directed, increase the working force and equipment to such an extent as to give reasonable assurance of compliance with the schedule of completion. The absence of such demands from the OMFED shall not relieve the Supplier of Supplier's obligations to secure the quality, the safe conducting of the work and the rate of progress required by the contract. The Supplier alone shall be and remain liable and responsible for the safety, efficiency and adequacy of Supplier's methods, materials, working force and equipment, irrespective of whether or not the Supplier makes any changes as a result of any order or orders received from the OMFED.

7.3 Right to inspect the work

The OMFED representative shall be given full assistance in the form of the necessary tools, instruments, equipment and qualified operations to facilitate inspection.

The OMFED reserves the right to call for the original test certificates for all the materials used in the erection work.

In the event the OMFED's inspection reveals poor quality of work/materials, the OMFED shall be at liberty to specify additional inspection procedures if required, to ascertain Supplier's compliance with the specifications of erection work.

Even though inspection is carried out by the OMFED or their representatives, such inspection shall not, however, relieve the Supplier of any or all responsibilities as per the contract, nor prejudice any claim, right or privilege which the OMFED may have because of the use of defective or unsatisfactory materials or bad workmanship.

8.0 Supplier's functions

The Supplier shall provide everything necessary for proper execution of the works, according to the drawings, schedule of quantities and specifications taken together whether the same may or may not be particularly shown or described therein, provided that the same can reasonably be inferred there from and if the Supplier finds any discrepancy therein, he shall immediately refer the same to the OMFED whose decision shall be final and binding on the Supplier.

The Supplier shall proceed with the work to be performed under this contract in the best and workman like manner by engaging qualified and efficient workers and finish the work in strict conformance with the drawings and specifications and any changes/modifications thereof made by the OMFED.

The work shall be carried out as approved by the OMFED or his authorized representative/s from time to time, keeping in view the overall schedule of completion of the project. The Supplier's job schedule must not disturb or interfere with OMFED's or the other Supplier's schedules of day-to-day work. The OMFED will provide all reasonable assistance for carrying out the jobs.

Night work will be permitted only with prior approval of the OMFED. The OMFED may also direct the Supplier to operate extra shifts over and above normal day shift to ensure completion of contract as per schedule. Adequate lighting wherever required should be provided by the Supplier at no extra cost. The Supplier should employ qualified electricians and wiremen for these facilities. In case of Supplier's failure to provide these facilities and personnel, the OMFED has the right to arrange such facilities and personnel and to change the cost thereof to the Supplier, on actual cost basis.

8.1 Third Party Insurance

Before commencing the execution of the works the Supplier, but without limiting his obligations and responsibilities, shall insure against his liability for any material or physical damage, loss or injury which may occur to any property, including that of the OMFED, or to any person, including any employee of the OMFED, or by arising out of the execution of works or in the carrying out of the Contract.

The Supplier shall, produce to the Engineer/OMFED the policy or policies of insurance and the receipts for payment of the current premiums, as and when required.

The terms shall include a provision whereby, in the event of any claim in respect of which the Supplier would be entitled to receive indemnity under the policy being brought or made against the OMFED, the insurer will indemnify the OMFED against such claims and any costs, charges and expenses in respect thereof.

Such insurance shall be for an amount not less than Rs.1, 00,000/- per occurrence, with the number of occurrences unlimited.

8.2 Compensation for accidents or injury

The OMFED shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workman or other person in the employment of the Supplier or any sub-Supplier, save and except an accident or injury resulting from any act or default of the OMFED, his agents, or servants. The Supplier shall indemnify and keep indemnified the OMFED against all such damages and compensation, save and except as aforesaid and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

The Supplier shall insure against such liability with an insurer approved by the OMFED, which approval shall not be unreasonably withheld, and shall continue such insurance during the whole of the time that any persons are employed by him on the works shall, on demand, produce to the OMFED or OMFED's representative such policy of insurance and the receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-Supplier, the Supplier's obligations to insure as aforesaid under this sub-clause shall be satisfied if the sub-Supplier shall have insured against the liability in respect of such persons in such manner that the OMFED is indemnified under the policy, but the Supplier shall require such sub-Supplier to produce

the OMFED or OMFED's representative, on demand, such policy of insurance and the receipt for the payment of the current premium.

8.3 Duties of Supplier Vis-à-vis other Suppliers:

Whenever proper execution of the work under the contract depends on the jobs carried out by some other Supplier, in such cases the Supplier should inspect all such erection and installation jobs and report to the OMFED regarding any defects or discrepancies. The Supplier's failure to do so shall constitute as acceptance of the other Supplier's installation/jobs as fit and proper for reception of Supplier's works.

The Supplier should also report any discrepancy between the executed work and the drawings.

The Supplier shall extend all necessary help/co-operation to other Supplier's working at the site in the interest of the work.

8.4 VARIATIONS

8.4.1 The OMFED shall make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion be desirable, he shall have power to order the Supplier to do and the Supplier shall do any of the following:

- (a) Increase or decrease the quantity of any work included in the contract.
- (b) Omit any such work.
- (c) Change the character or quality or kind of any such work.
- (d) Change the levels, lines, position and dimensions of any part of the works, and
- (e) Execute additional work of any kind necessary for the completion of the works.

And no such variation shall in any way vitiate or invalidate the contract, but the value, if any, of all such variations shall be taken into account in ascertaining the amount of the Contract price.

8.4.2 No such variations shall be made by the Supplier without an order in writing of the OMFED. Provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an order given under this clause, but is the result of the quantities exceeding or being less than those stated in the Contract / Bill of Quantities. Provided also that if for any reason the OMFED shall consider it desirable to given any such order verbally, the Supplier shall comply with such order and any confirmation in writing of such verbal order given by the OMFED, whether before or after the carrying out of the order, shall be deemed to be an order in writing within the meaning of this clause. Provided further that if the Supplier shall within seven days confirm in writing to the OMFED and such confirmation shall not be contradicted in writing by the OMFED within 14 days, it shall be deemed to be an order in writing by the OMFED.

8.4.3 All extra or additional work done or work omitted by order of the OMFED shall be valued at the rates and prices set out in the contract if in the opinion of the OMFED, the same shall be applicable. If the contract does not contain any rates or prices applicable to the extra or additional work, then suitable rates or prices shall be agreed upon between the OMFED shall fix such rates or prices as shall, in his opinion, be reasonable and proper.

8.4.4 Provided that if the nature or amount of any omission or addition relative to the nature or amount of the whole of the works or to any part thereof shall be such that, in the opinion of the OMFED, the rate or price contained in the contract for any item of the works is, by

reason of such omission or addition, rendered unreasonable or inapplicable, then a suitable rate or price shall be agreed upon between the OMFED and the Supplier. In the event of disagreement of the OMFED shall fix such other rate or price as shall, in his opinion, be reasonable and proper having regard to the circumstances.

Provided also that no increase or decrease under sub-clause 8.4.1 of this clause or variation of rate or price under sub-clause 8.4.2 of this clause shall be made unless, as soon after the date of the order as is practicable and, in the case of extra or additional work, before the commencement of the work or as soon thereafter as is practicable, notice shall have been given in writing:

- a) By the Supplier to the OMFED of his intention to claim extra payment or a varied rate or price.
Or
 - b) By the OMFED to the Supplier of his intention to vary a rate or price.
- 8.4.5 If on certified completion of the whole of the works, it shall be found that a reduction or increase greater than 15 percent of the sum named in the Letter of Acceptance results from the aggregate effect of all Variation Orders but not from any other cause, the amount of the contract price shall be adjusted by such sum as may be agreed between the Supplier and the OMFED or failing agreement, fixed by the OMFED having regard to all material and relevant factors, including the Supplier's site and general overhead costs of the contract.
- 8.4.6 The Supplier shall send to the OMFED's representative once in every month an account given particulars, as full and detailed as possible, of all claims for any additional payment to which the Supplier may consider himself entitled and of all extra or additional work ordered by the OMFED which he has executed during the preceding month.

No final or interim claim for payment for any such work or expense will be considered which has not been included in such particulars. Provided always that the OMFED shall be entitled to authorize payment to be made for any such work or expense, notwithstanding the Supplier's failure to comply with this condition, if the Supplier has, at the earliest practicable opportunity, notified the OMFED in writing that he intends to make a claim for such work.

Note: This clause shall not be applicable for complete turn-key jobs.

8.5 Duties of the Supplier Vis-à-vis the OMFED

The equipment and the items, if any, to be supplied by the OMFED for erection, testing and commissioning by the Supplier, shall be as listed in the contract. The Supplier shall keep a check on deliveries of all such equipment covered in the scope of erection, testing and commissioning work and shall advise the OMFED well in advance regarding possible hold-up in Supplier's work due to the likely delay in delivery of such equipment/components to enable him to take remedial actions.

8.6 Preparation of foundations, surfaces etc. for Erection of equipments:

Supplier shall carry out final adjustments of foundations, leveling and dressing of foundation surfaces, bedding and grouting of anchor bolts, bed plates etc, required for seating of equipment in proper position. The Supplier shall be responsible for the reference lines and proper alignment of the equipment. However, all minor civil works which form an inseparable part of the installation and erection job like digging trenches for laying of cables, conduits and underground pipes, making cut-outs in walls, floors and ceilings for pipelines, adjustment, leveling, dressing and grouting of foundations,

grouting of supports are to be carried out: by the Supplier at no extra cost. The necessary refilling/repairs of these cutouts, pockets and trenches shall be done by the Supplier: The Supplier should arrange for laying the supports, cut-outs, grouting of bolts, etc, when the civil works are in progress, so as to avoid refilling/repair works. The damages occurring to civil and other works are to be made good by the Supplier at Supplier's own costs.

9.0 Supply of tools, tackles and materials

The Supplier shall, at his own expense, provide all the necessary equipment, tools and tackles, haulage power, consumables, lubricants & sundries necessary for effective execution and completion of the works during erection, testing, commissioning & trial run.

10.0 Protection of plant

The OMFED shall not be responsible or held liable for any damage to person or property consequent upon the use, misuse or failure of any erection tools and equipment used by the Supplier or any his sub-Supplier's even though such tools and equipment may be furnished, rented or loaned to the Supplier or any of his sub-Suppliers. The acceptance and / or use of any such tools and equipment by the Supplier or his sub-Supplier shall be construed to mean that the Supplier accepts all responsibility for and agrees to indemnify and save the OMFED from any and all claims for said damages resulting from the said use, misuse or failure of such tools and equipments.

The Supplier or his sub-Supplier shall be responsible during the works, for protection of work, which has been completed by other Suppliers. Necessary care must be taken to see that the Supplier's men cause no damage to the same during the course of execution of the work.

All other works completed or in progress as well as machinery and equipment that are liable to be damaged by the Supplier's work shall be protected by the Supplier and protection shall remain and be maintained until its removal is directed by the OMFED.

The Supplier shall effectively protect from the effects of weather and from damages or defacement and shall cover appropriately, wherever required, all the works for their complete protection.

The Supplier shall carry out the work without damage to any work and property adjacent to the area of Supplier's work to whomsoever it may belong and without interference with the operation of existing machines or equipment.

Adequate lighting, guarding and watching at end near all the storage, handling, fabrication, reassembly and erection sites for properly carrying out the work and for safety and security shall be provided by the Supplier at his cost. The Supplier should adequately light the work area during nighttime also. The Supplier should also engage adequate electricians/wiremen, helper etc. to carry out and maintain these lighting facilities. If the Supplier fails in this regard, the OMFED may provide lighting facilities as he may deem necessary and charge the cost thereof to the Supplier.

The Supplier shall take full responsibility for the care of the works or any section or portions thereof until the date stated in the taking over certificate issued in respect thereof and in case any damage or loss shall happen to any portion of the works not taken over as aforesaid, from any cause whatsoever, the same shall be made good by and at the sole cost of the Supplier and to the satisfaction of the OMFED. The Supplier shall also be liable for any loss of or damage to the works occasioned by the Supplier or

his sub-Supplier in the course of any operations carried out by the Supplier or his sub-Suppliers for the purpose of completing any outstanding work or complying with the Supplier's obligations.

11. Unloading, transportation and inspection

The Supplier shall be required to unload all the materials/equipment from the carriers. The Supplier shall plan in advance, based on the information received from the OMFED, Supplier's requirement of various tools, tackles, jacks, cranes, sleepers etc. required to unload the material/equipment promptly and efficiently. The Supplier shall ensure that adequate and all measures necessary to avoid any damage whatsoever to the equipment at the time of unloading are taken.

Any demurrage / detention charges incurred due to the delay in unloading the material/equipment and releasing the carriers shall be charged to the Supplier's account.

The Supplier shall be responsible for the reception and safe storage on site of all plant and equipment delivered or handled over to the Supplier, for the purposes of the contract.

The Supplier shall safely transport/shift the unloaded materials/equipment to the storage area and/or the place of work, as the case may be.

The materials/equipment would be carefully unpacked by the opening the wooden cases/other modes of packing as the case may be.

In case of equipments / materials to be supplied by the OMFED, all the materials / equipments received from OMFED prior to arrival of the Supplier at site, shall be handed over to the Supplier who shall, thereupon, inspect the same & furnish the receipt to OMFED.

Detailed inventory of various items shall be prepared clearly listing the shortages, breakages / damages after checking the contents with respect to the Supplier's packing list, OMFED's order and approved drawings. The Supplier shall also check every equipment for any shortage/shortcoming that may create difficulty at the time of installation, commissioning & trial run.

All the information and observations by the Supplier shall be furnished in the form of 'INSPECTION REPORT' to the OMFED with specific mention/suggestions which in the opinion of the Supplier should be given due consideration and immediate necessary actions, to enable the OMFED to arrange repair or replacement well in time and avoid delays due to non-availability of equipment and parts at the time of their actual need.

The protection, safety and security of the materials shall be the responsibility of the Supplier, until they are handed over to the OMFED after erection, commissioning and testing and performance trial run as per the terms of the Contract.

12.0 Storage of equipment.

The Supplier shall be responsible for the proper storage and maintenance of all materials/equipment under the Supplier's custody. The Supplier shall take all required steps to carry out frequent inspection of equipment/materials stored as well as erected equipment until the same are taken over by the OMFED. The following procedure shall apply for the same:

The Supplier's inspector shall check stored and installed equipment/materials to observe signs of corrosion, damage to protective coating to parts, open ends in pipes, vessels and equipment, insulation resistance of electrical equipment etc. The Supplier shall immediately arrange a coat of protective painting whenever required. A record of all observations made on equipment, defects noticed shall be promptly communicated to the OMFED and OMFED's advice taken regarding the repairs/rectifications. The Supplier shall there upon carry out such repairs/rectifications at his own cost. In case the Supplier is not competent to carry out such repairs/rectifications, the OMFED reserves the right to get this done by other competent agencies at the Supplier's responsibility and risk and the entire cost for the same shall be recovered from the Supplier's bills.

The Supplier's inspector shall also inspect and provide lubrication to the assembled equipment. The shafts of such equipment shall be periodically rotated to prevent rusting as well as to check freeness of the same.

The Inspector shall check for any signs of moisture or rusting in any equipment.

If the commissioning of equipment is delayed after installation of the equipment, the Supplier shall carry out all protective measures suggested by the OMFED during such period.

Adequate security measures shall be taken by the Supplier to prevent theft and loss of materials under the Suppliers custody. The Supplier shall carry out periodical inventory checks of the materials stored and installed by the Supplier and any loss noticed shall be immediately reported to the OMFED. A proper record of these inventories shall be maintained by the Supplier. The Supplier should not sell, assign, and mortgages, hypothecate or remove equipment or materials, which has been installed or stored at the site under Supplier's custody without the written consent of the OMFED.

Suitable grease recommended for protection of surfaces against rusting (refined from petroleum oil with lanoline minimum (70 DEG.CENT.) and water in traces) shall be applied over all equipment as required once in every three months. Quality of grease is to be approved by OMFED.

All equipment shall be stored inside a closed shed or in the open depending upon whether they are of indoor or outdoor design. Adequate storage area, as required, shall be made available by the Supplier, within the site premises.

All the necessary items/goods required for protection as described above shall be arranged by the Supplier and such cost shall be included in the Contract price.

13.0 Approvals

The Supplier shall obtain the necessary approvals of Factories & Boilers Inspectorate, Electrical Inspectorate, Legal Meteorology dept., Explosives Inspectorate and any other state/local authorities, as may be statutorily required or as may be directed by OMFED, and the cost of obtaining such approvals shall be included in the Contract price.

All the necessary details, drawings, submission of application and proformas will be furnished by the Supplier to the OMFED for verification/signature, and shall therefore be submitted to the appropriate authorities for approval.

The Supplier on behalf of OMFED shall submit the necessary application duly filled-in, together with the prescribed fees to the appropriate authorities. However, all the actual statutory fees paid by the Supplier shall be reimbursed by OMFED upon production of receipt. The Supplier shall also make all necessary arrangements for inspection of the works by the statutory authorities, as and when required. Cost of all such inspections shall be included in the contract price.

Whenever necessary or required, the Supplier shall furnish the necessary test and/or inspection certificates etc, from the appropriate authorities as per IBR, IER and other statutory regulations and the cost of obtaining these certificates shall be included in the contract price.

In case of capacity enhancement of existing plants, the Supplier shall arrange for and obtain necessary approvals, as stated herein, for the entire expanded plant, either in phases or in whole as the case may be & the cost of obtaining such approvals shall be included in the Contract price.

Any modifications or changes required or advised by the appropriate authorities during the course of inspection and/or the Supplier at his own cost shall carry out approval.

14.0 Review and co-ordination of erection work

The Supplier shall depute senior and competent personnel to attend the site co-ordination meetings that would generally be held at the site every month. The Supplier shall take necessary action to implement the decisions arrived at such meetings and shall also update the erection schedule, accordingly.

SECTION -IV (A)

SPECIAL CONDITIONS OF CONTRACT

(FOR MECHANICAL INSTALLATION)

MECHANICAL INSTALLATION

The installation work would comprise of:

- a) General installation i.e. positioning and installing all the equipments as per approved layout drawings and as per the contract.
- b) Supply and installation of structural platforms and tables.
- c) Supply and installation of all service piping including ancillary items.
- d) Insulation and cladding of piping equipment and electrical auto tracing of LSHS, including supply of materials.
- e) Interconnections of services and electrical with equipment.
- f) Guide line for expansion work.
- g) Clean up of work site.
- h) Supply of all cleaning chemicals and lubricants,
- i) Testing, commissioning and start-up.
- j) Painting including supply of paints as approved by the OMFED.
- k) Training of personnel.

Detailed specifications are given in the subsequent clauses.

2.0 GENERAL INSTALLATION

2.1 Positioning of equipment.

The work involves preparation of access for moving of the plant and equipment including their fittings from the work site godown or from the place within the site where they have been unloaded, to the place of erection, decrafting and placing on the foundation wherever required. All the civil foundations as per the manufacturer / Supplier's drawings shall be arranged by the bidder. The Supplier shall place the equipment and carry out final adjustment of the foundations including alignment and dressing of foundation surface, embedding and grouting of anchor bolts and bedplates. The Supplier shall be responsible for obtaining correct reference lines for purpose of fixing the alignment of various equipment. Tolerances shall be as specified in equipment manufacturers drawings or as stipulated by the OMFED's Engineer. No equipment shall be permanently bolted down to foundations or structure until the alignment has been checked by the Supplier and witnessed by the OMFED. The Supplier shall carry out minor alterations in the anchor bolts, pockets etc., at no extra cost and set the equipment properly as per approved layout, drawings and manufacturer's instructions. The Supplier shall supply all the necessary foundation / anchor bolts and bedplates without extra cost.

The Supplier shall supply, fix and maintain, at his own cost, during the erection work, all the necessary centering, scaffolding, staging required not only for proper execution and protection of the said work but also for protection of the surrounding plant and

equipment. The Supplier shall take out and remove any or all such centering, scaffolding, staging planking etc., as occasion shall require or when ordered to do so and shall fully reinstate and make good all things disturbed during execution of the work, to the satisfaction of the OMFED. The Supplier shall be paid no additional amount for the above.

3.0 CLEANING CONDITION AND LUBRICANTS

The necessary quantities of cleaning chemicals, lubricants, etc. required for the installation and commissioning, testing and start up of all the equipment till handing over are to be supplied the Supplier and nothing extra would be paid for these.

4.0 TESTING, COMMISSIONING AND START UP

4.1 The Supplier shall operate, maintain and give satisfactory trial run of the plant for a period of continuous **10 days (Ten Days)** at the rated output, after satisfactory commissioning and start-up of the plant. All rectification of damages / defects and routine troubleshooting should be carried out by the Supplier. The Supplier shall incorporate / execute necessary minor modifications during the trial period for maximising operational efficiency. The Supplier should also execute minor modifications as may be suggested by the manufacturer / OMFED. The Supplier shall suggest recommended log sheet proformas for recording necessary operating data and pass it on to the OMFED in proof of satisfactory rated output and performance of the equipments / plant.

4.2 The commissioning shall also include the following for each equipment:

4.2.1 Field dis-assembly and assembly.

4.2.2 Clean out of lubrication system including chemical cleaning wherever required.

4.2.3 Circulation of lubricant to check flow.

4.2.4 Clean out and check out of all the service lines.

4.2.5 Check out and commissioning of instruments, equipment and plants, filtering of transformer and other oils so that if deteriorated, they shall attain the required properties/standards, specified tests in this regard must be carried out by approved authorities and their satisfactory reports submitted to the OMFED before start-up.

4.2.6 Recharging or make-up filling of lubricant oil up to the desired level in the lubrication system of individual machine.

4.2.7 Operation in empty condition to check general operation details wherever required and wherever possible.

4.2.8 Closed loop dynamic testing with water wherever required.

4.2.9 Operation under load and gradual load increase to attain maximum rated output.

4.2.10 Trouble shooting during the trial period.

4.3 The Supplier shall demonstrate proper working of all mechanical and electrical controls; safety and protective device, in presence of the OMFED's engineer and the same should be duly recorded.

4.4 After conducting testing, in case a particular equipment is not working properly or not giving rated output the Supplier will furnish a detailed report to the OMFED stating

therein the detailed account on the performance of the equipment with possible reasons for improper or not working of the same in case such equipment is supplied by OMFED.

The OMFED after receipt of report from the Supplier would take up the matter with the manufacturers and if required would invite the representative of original manufacturers. In case the OMFED considers that the nonperformance of equipment is only due to in-experience of the Supplier, then the charges incurred for the manufacturer's representative visit would be debited to the Supplier's account.

- 4.5 In case of turnkey contracts, the Supplier shall furnish a detailed account of the performance of all the equipments. In case any particular equipment fails to perform properly or at its rated output, then the Supplier shall take up the matter with the original manufacturer, under intimation to OMFED. In case OMFED considers it necessary, the Supplier shall invite, at his own cost, the technical personnel of the original manufacturer to visit the site & carry out necessary rectification/modifications to get the rated performance. In case the Supplier fails to do so within 7 days of receipt of instructions from OMFED, the OMFED shall take necessary action to invite the representatives of the Original manufacturer to visit the site & the cost of such visit(s) shall be debited to the Supplier's account.

- 4.6 Further before commencement of testing of commissioning, the OMFED reserves the right to invite the original manufacturer's representative at the cost of the Supplier for start-up help, assist and guide the Supplier during commissioning in the following cases:

- a) The Supplier has no previous experience of commissioning and start-up of the similar equipment.
- b) The OMFED is of the opinion that the Supplier is not capable to commission and start-up of certain specific equipment.

However, in either of the cases the manufacturer's representatives would be called with prior information to the Supplier and the Supplier will have to extend all co-operation to such representatives in good spirit and in the interest of the work.

- 4.7 After satisfactory commissioning and start-up the Supplier shall keep his representatives under whose supervision the OMFED's staff shall be operating and maintaining the plant and equipment for the trial run period of 30 days. The Supplier's representatives should be present at all times during the running and operation of plant and equipment. During this period the Supplier shall ensure proper working of complete plant and equipment and attend any works required to be done and shall also take complete responsibility for proper operation and maintenance of the complete plant and equipment.

5.0 PAINTING

All the equipment/machineries like motors, pumps, HT / LT panel, transformer, switch boards, starters, junction boxes, isolators, storage tanks, supporting structures, pipe supports and MS / GI pipes and all exposed and visible iron parts included in the scope off erection / commissioning shall be given double coat of paint of approved shade over a double coat of anti-corrosive primer wherever necessary.

Irrespective of the condition of original paint of equipment / machineries / structures / supports. All surfaces wherever required must be properly cleaned from scale, dirt and grease prior to painting. Spray painting must preferably be used on all the equipment / machineries and wherever practicable. Suitable and necessary cleaning / wiping of

sight / dial glasses, other non-metallic parts, flooring, walls and other surfaces which have been spoiled by paint during painting must also be carried out by the Supplier.

Lettering and other markings, including capacity and flow direction markings, shall also be carried out by the Supplier on the tanks, pipe lines, starter's, motors, isolators and wherever else necessary, as directed and as per the standard practice of installation. ISI colour codes and colour charts as mentioned in Annexure-III must be adhered to. Supply of all paints and all other materials required it included in the scope of supply of the Supplier under this contract/order.

6.0 TRAINING OF PERSONNEL

Necessary staff as may be deputed by the OMFED shall be trained by the Supplier for operating the plant. The personnel will be associated for the training during the installation, testing, commissioning, start-up and trial run period and the training tenure shall be extended for a minimum period of one month from the date of commissioning and start-up.

SECTION -IV (B)
SPECIAL CONDITIONS OF CONTACT
FOR ELECTRICAL INSTALLATION

1.0 SCOPE

The intent of this specification is to define the requirements for the installation, testing and commissioning of the electrical system like high tension switch yard with accessories and equipments, transformers, HT panels, oil circuit breakers, LT panels and power control centers, Distribution boards, capacitors and banks panels, power and control cables, remote push button stations, motors, earthing network, etc. Requirement of a particular project shall be as specified in schedule of quantities.

2.0 STANDARDS

- 2.1 The work shall be carried out in the best workman like manner in conformity with this specification, the relevant specification / codes of practice of the Indian Standards Institution, approved drawings and the instructions issued by the Engineer-in-charge or his authorised representatives, from time to time. Some of the relevant Indian Standards are listed in Annexure-IV.
- 2.2 In addition to the standards as mentioned in 2.1, all works shall also confirm to the requirements of the following:
- a) Indian electricity act and rules framed there under.
 - b) Fire Insurance Regulations.
 - c) Regulations laid down by the chief electrical inspector of the state / Electricity board.
 - d) Regulations laid down by the factory Inspector of the state.
 - e) Any other regulations laid down by the local authorities.
 - f) Installation & operating manuals of original manufacturers of equipments.

3.0 EQUIPMENT AND ACCESSORIES –SPECIFICATIONS

This defines specifications and requirements mainly for the equipment and accessories which are generally supplied by the erection agencies and do not cover the specification of main electrical equipment such as Transformers, HT. and LT. panels, switchboards and motors etc. which may be supplied by the OMFED.

All materials, fittings and appliances to be supplied by the Supplier shall be of best quality and shall confirm to the specification given here under. The equipment shall be manufactured in accordance with current Indian Standard Specifications wherever they exist or with the BS or NMA specifications, if no such ISS are available. In the absence of any specification, the materials shall be as approved by the OMFED or his authorized representatives.

Makes of bought out items selected by the Supplier must be furnished by him as per the Performa given in Annexure-V.

3.1 **Control Cables**

Control cables for use on 415 V system shall be of 1100 volts grade, copper conductor, PVC insulated, PVC sheathed, armored and overall PVC sheathed, strictly as per IS: 1554 (Part I) – 1976. Unarmored cable to be used only if specifically mentioned in schedule of quantities.

The size of these cables shall be as specified in schedule of quantities or as per erection drawing. THE MINIMUM CONDUCTOR DIAMETER SHALL BE 2.5 SQMM.

3.2 **Motor Isolators**

These shall be in Aluminum cast housing, completely dust, vermin and weather proof, suitable for 25A, 415 volts, 50 Hz with rotary type switch and reroll type metallic plug, complete with cable gland for incoming and outgoing cables. Operating hand to be of metal and final finish of housing to be buffer mirror. Sample to be got approved before supply.

DETAILED TECHNICAL SPECS. OF MAJOR EQUIPMENTS:

PULP UNLOADING AND STORAGE SECTION

Pulp Unloading Suction Lance

QTY : As per BOQ
Application : Pulp from Drums shall be transferred into the dump tank.
Capacity : Suitable

Pulp Unloading Pump

QTY : As per BOQ
Application : Unloading of ambient pulp from 200 L drum and transfer to pulp storage tank or dump tank.
Capacity : Suitable
Type : AOD.

Pulp Storage Tank

QTY : As per BOQ
Capacity : 3 KL
MOC : SS316 (Singed Wall)

Nozzles/fittings CIP sprayball, Agitator, Water Inlet
Bottom : Product Outlet

Supports: Stainless steel pipe leg with base plate resting on civil foundation

Pulp Transfer Pump

QTY : As per BOQ

Capacity: As per BOQ

Head: Suitable

Material of construction: Liquid contact parts metal in stainless steel 316

Type: Twin Screw Pump

Duplex Strainer

QTY : As per BOQ

Capacity : Suitable

Material of construction: Liquid contact parts metal in stainless steel 316

Type: Pipe in Pipe

INGREDIENT DOSING SECTION

Ingredient Dosing Tank

QTY	: As per BOQ
Capacity	: 500 L
MOC	: SS304
Nozzles/fittings:	
Top cone	: Water inlet, CIP spray ball, Agitator
Shell	: Product recirculation inlet
Bottom cone	: Product Outlet
Supports	: Stainless steel pipe leg with base plate resting on civil foundation Recirculation cum transfer pump

Ingredient Transfer Pumps

QTY	: As per BOQ
Capacity	: As per BOQ
Type	: Centrifugal mono block
Fitting	: Quick opening sanitary fitting
Construction	: SS 304 ; Product contact parts in SS 316
Mounting	: Free standing with adjustable ball feet
Seal	: Mechanical shaft seal
Gasket	: Food grade nitrile rubber
Shroud	: SS 304
Motor	: Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC with SS shroud
Accessories	: SS 316 inlet & outlet with complete unions

Simplex Strainer

QTY	: As per BOQ
Capacity	: Suitable
Material of construction: Liquid contact parts metal in stainless steel 316	
Type: Pipe in Pipe	

DRY SUGAR HANDLING SYSTEM

Dumping Through Mezzanine floor directly in Batch Tank

Mezzanine Floor shall provide by Purchaser.

SUGAR DISSOLVING SYSTEM

Batch Sugar Dissolving Tank (Raw Syrup Tank)

Capacity: 4 KL

QTY : As per BOQ

Material : Inner shell - AISI 304
Outer Cladding – AISI 304
Nozzles/fittings

Top cone: Manhole, Water inlet, CIP spray ball, Air Vent, Syrup recirculation inlet,
Sugar Inlet funnel

Application: To prepare sugar syrup by simultaneous heating and mixing of water and dry sugar to make final syrup of 60 Brix at 80 Deg C with radial jet mixing type of system.

Shell: Temperature transmitter, Sample valve,
½" ball valve, Low-level switch, Syrup recirculation inlet with Jet Mixer

Bottom cone: Recirculation outlet, Syrup Outlet

Insulation :50 mm thick RBMW on shell & bottom cone

Cladding :2 mm thick stainless steel 304

Supports: Stainless steel pipe leg with base plate resting on civil foundation, Top railing
with toe-guard and common ladder for both tanks

Accessories : Recirculation pump, tubular syrup heater with steam control valve, Level
glass tube and condensate accessories.

Sugar Syrup Recirculation Pumps

Capacity : 10KLPH

QTY : As per BOQ

Type : Centrifugal mono block

Fitting : Quick opening sanitary fitting

Construction : SS 304 ; Product contact parts in SS 316

Mounting : Free standing with adjustable ball feet

Seal : Mechanical shaft seal

Gasket	: Food grade nitrile rubber
Shroud	: SS 304
Motor	: Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC with SS shroud
Accessories	: SS 316 inlet & outlet with complete unions

Tubular Syrup heater

QTY	: As per BOQ
Capacity	: Suitable
Application	: To heat sugar syrup water up to required temperature For various purposes.
Type	: THE
Heating Medium	: Steam
MOC	: AISI 316

Sugar Syrup Transfer Pumps

QTY	: As per BOQ
Capacity	: 5 KLPH
Type	: Centrifugal mono block
Fitting	: Quick opening sanitary fitting
Construction	: SS 304 ; Product contact parts in SS 316
Mounting	: Free standing with adjustable ball feet
Seal	: Mechanical shaft seal
Gasket	: Food grade nitrile rubber
Shroud	: SS 304
Motor	: Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC with SS shroud
Accessories	: SS 316 inlet & outlet with complete unions

Duplex Strainer

QTY	: As per BOQ
Capacity	: 5 KLPH
Material of construction:	Liquid contact parts metal in stainless steel 316
Type:	Pipe in Pipe

Pre-coat Tank

QTY : As per BOQ
Capacity : 250 L
MOC : SS304

Nozzles/fittings

Top cone: Water inlet, CIP spray ball, Agitator
Shell: Syrup recirculation inlet,
Bottom cone: Product Outlet
Supports: Stainless steel pipe leg with base plate resting on civil foundation

Plate & Frame Filter Press

QTY : As per BOQ
Capacity : 5 KLPH
Material of construction: SS 304
Accessories: Hydraulic Cylinder with mechanical locking device
and power pack

Sugar Syrup Cooler

Capacity : 5 KLPH
Material of construction : Stainless steel 304
Temperature Program : 85 – 70 – 45 – 20
Plate Pack : Three Stage Cooling, first –
process water, second – cooling
tower water, third – chilled
water
Accessories : Temperature Indication at
Syrup Inlet & Outlet

Divert Panel

Material of construction : Stainless steel 304
Number of ports : As per final P&ID
Accessories : SS dummy nuts & proximity switches

Hot Water Recovery Tank

Capacity : 3 KL
MOC : SS304

Nozzles/fittings,

Top cone : Manhole with lockable cover,
Water inlet, CIP spray ball, Air
Vent

Shell : Temperature transmitter, High
& Low level switch

Bottom cone	: Water Outlet
Insulation	: 50 mm thick RBMW on shell & bottom cone
Cladding	: 2 mm thick stainless steel 304
Supports	: Stainless steel pipe leg with base plate resting on civil foundation, Top railing with toe-guard and ladder

Hot Water Transfer Pumps

QTY	: As per BOQ
Capacity	: 7.5 KLPH
Type	: Centrifugal mono block
Fitting	: Quick opening sanitary fitting
Construction	: SS 304 ; Product contact parts in SS 316
Mounting	: Free standing with adjustable ball feet
Seal	: Mechanical shaft seal
Gasket	: Food grade nitrile rubber
Shroud	: SS 304
Motor	: Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC with SS shroud
Accessories	: SS 316 inlet & outlet with complete unions

Sugar Syrup Storage Tank

QTY	: As per BOQ
Capacity	: 6 KL
MOC	: SS304
Nozzles/fittings:	
Top cone	: Manhole, CIP spray ball, Air Vent
Shell	: Low-level switch, Syrup recirculation inlet with Jet Mixer
Bottom cone	: Recirculation outlet, Syrup Outlet
Supports	: Stainless steel pipe leg with base plate resting on civil foundation, Top railing with toe-guard and common ladder for tanks
Accessories	: Recirculation pump or agitator, Level glass tube and sampling valve

Sugar Syrup Recirculation Pumps

QTY	: As per BOQ
Capacity	: 5 KLPH
Type	: Centrifugal mono block
Fitting	: Quick opening sanitary fitting
Construction	: SS 304 ; Product contact parts in SS 316
Mounting	: Free standing with adjustable ball feet
Seal	: Mechanical shaft seal
Gasket	: Food grade nitrile rubber
Shroud	: SS 304
Motor	: Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC with SS shroud
Accessories	: SS 316 inlet & outlet with complete unions

Sugar Syrup Transfer Pump

QTY	: As per BOQ
Capacity	: 10 KLPH
Type	: Centrifugal mono block
Fitting	: Quick opening sanitary fitting
Construction	: SS 304 ; Product contact parts in SS 316
Mounting	: Free standing with adjustable ball feet
Seal	: Mechanical shaft seal
Gasket	: Food grade nitrile rubber
Shroud	: SS 304
Motor	: Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC with SS shroud
Accessories	: SS 316 inlet & outlet with complete unions

COCOA AND PECTIN MIXING SECTIONS

Cocoa Slurry Preparation Tank

QTY	: As per BOQ
Capacity	: As per specified in the list of equipment
Type	: Jacketed, Insulated vertical cylindrical tank.
Material	: a) Inner shell - AISI 304 b) Intermediate - AISI 304 c) Outer Cladding- AISI 304
Finish	: 150 grit

Accessories & Ports : Air Vent, Inlet/outlet, CIP spray ball, high- and low-level sensors, Level transmitter, temperature sensor, manhole, Agitator (top mounted) and other standard accessories.

Instruments : RTD for temperature monitoring & LT for quantity

Pectin Slurry Preparation Tank

QTY : As per BOQ

Capacity : As per specified in the list of equipment

Type : Insulated vertical cylindrical tank.

Material : a) Inner shell - AISI 304
b) Outer Cladding- AISI 304

Finish : 150 grit

Accessories & Ports : Air Vent, Inlet/outlet, CIP spray ball, high- and low-level sensors, Level transmitter, temperature sensor, manhole, Agitator (top mounted) and other standard accessories.

Instruments : RTD for temperature monitoring & LT for quantity

Recirculation Pump with VFD

QTY : As per BOQ

Capacity : 10 KLPH

Type : Centrifugal mono block

Fitting : Quick opening sanitary fitting

Construction : SS 304 ; Product contact parts in SS 316

Mounting : Free standing with adjustable ball feet

Seal : Mechanical shaft seal

Gasket : Food grade nitrile rubber

Shroud : SS 304

Motor : Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC
with SS shroud

Accessories : SS 316 inlet & outlet with complete unions

Common Heater /Cooler for Cocoa & Pectin Slurry

Quantity	: As per BOQ
Capacity	: 10 KLPH
Type	: PHE with PID based temp. Control
MOC	: SS 316 plates (0.6 mm thickness)
Gasket	: Both side EPDM gasket
Ports	: Necessary Ports / connections for Temp. / Pressure Sensing to be provided
Accessories	: SS floor plate, Name plate, Connection Name Plate and all
Application	: The Common PHE design for both heating and Cooling Purpose To heat Cocoa Slurry from 30 to 90 Deg and again cool down to 10-15 Deg. For Pectin Slurry Preparation heat from 30 to 65 Deg and Cool down to less than 40 Deg

Hot Water Generation Module THE based

Quantity	1 Set
Capacity	Suitable to generate and continuously supply adequate hot water at required temperature.
Type	Heat Exchanger THE/PHE
Service	Dry Saturated Steam @ 3.5 kg/cm ² (g)
MOC:	
Plates/Tubes	SS 316 plates of 0.6 mm thick/SS 316 tubes
Frame	Free standing SS 304 clad carbon steel frame on SS 304 adjustable ball feet/AISI 304 shell.
Gasket	Snap/clip ON type of EPDM.
Others:	
Ports	Necessary ports/connections for temp. / pressure sensing to be provided.
Accessories	Automatic Online soft water make up arrangement, expansion vessel, safety valve, air vent, SS floor plate, Name plate, Connection name plate etc.

APT for Condensate Recovery:

Capacity	To meet the functional requirement
Quantity	1 Set
Type	Suitable to avoid Steam Losses

Hot Water Pump (Centrifugal Type):

Capacity	Suitable for above THE/PHE
Quantity	1 Set
Type	Centrifugal Type

High Shear Mixer/Powder Blender Common

Capacity : 1000 Kg/hr.

Quantity : 1 No.

All parts in contact with the product are made from stainless steel 304.

TECHNICAL DETAILS**Surfaces:**

Inside polished with smoothly ground welding seams to $Ra \leq 0,8$

Outside ground, $Ra \leq 1,6$.

All inlets are side mounted or mounted on bottom cone.

Pipes and connections are:

Inlet/outlet pipes: ISO 2037

Connections: SMS unions

Powder line, pipe: ISO 2037

ACCESSORIES:

- 1- Ø200 mm turbo unit with water flushed mechanical shaft seal.
- 1 - Bottom mounted water flushed Turbo unit below tank.
- 1 Hopper-50 LTR
- 1 - Grill mounted at the top of the mixing Tank for proper dosing of powder ingredients
- 1- Safety Switch
- 1 - Frame in stainless Steel
- 1- Manual Product Valves
- 1- Platform to place 2 nos. bags and unloading powder into hopper manually

High Shear Mixer Outlet Pump

QTY	: As per BOQ
Capacity	: 10 KLPH
Type	: Centrifugal mono block
Fitting	: Quick opening sanitary fitting
Construction	: SS 304 ; Product contact parts in SS 316
Mounting	: Free standing with adjustable ball feet
Seal	: Mechanical shaft seal
Gasket	: Food grade nitrile rubber
Shroud	: SS 304
Motor	: Suitable for 440V, 3 phase, 50 Hz AC supply, IE 3 TEFC with SS shroud
Accessories	: SS 316 inlet & outlet with complete unions

Duplex Strainer

QTY	: As per BOQ
Capacity	:10 KLPH
Material of construction:	Liquid contact parts metal in stainless steel 316
Type:	Pipe in Pipe

CIP RETURN PUMP

Capacity	: Suitable
Quantity	: 1 No.
MOC	: All product contact parts in AISI 316
Type	: • Self-priming centrifugal monoblock with mechanical seal • Free standing with adjustable ball feet • EPDM gasket
Motor	415 V AC, 3 Phase, 50 Hz, induction motor with TEFC/IP55 enclosure with SS 304 Shroud IE3 efficiency.

Curd /RO water Pasteurization System

Milk Transfer Pump to Curd Milk Pasteurizer.

QTY	: As per BOQ
Capacity	: 5 KLPH
Type	: Centrifugal mono block
Fitting	: Quick opening sanitary fitting
Construction	: SS 304 ; Product contact parts in SS 316
Mounting	: Free standing with adjustable ball feet
Seal	: Mechanical shaft seal
Gasket	: Food grade nitrile rubber
Shroud	: SS 304

Note: Bidder shall consider Standardized Pasteurized Milk from Existing UHT section (2 X20KL) tanks for Curd Milk Pasteurization. Accordingly Valve Cluster and Transfer piping, Pump & Electrical automation shall take care by Bidder.

CURD MILK /RO WATER PASTEURIZER WITH ALL ACCESSORIES

Functional Requirements:

This would be used for Pasteurization of Curd Milk. The heating media would be hot water generated by separate THE using steam.

Design Requirements:

Pasteurizer should be dual duty for both Curd Milk & RO Water Pasteurization, complete module with separate hot water generating set etc., would be required for pasteurization of curd milk/RO Water with hot water section mounted on SS skid.

The brief description of pasteurizer shall be as given below:

Quantity	1 No.
Capacity:	5 KLPH
Type:	Plate Heat Exchanger with regeneration.
Temp. Program:	4-65/70H-90/20 sec/10 min-4/42
Services:	Chilled water at + 1.5° C (min) & + 2° C (max); Milk to chilled water ratio – 1:1.5 Milk to Hot water ratio – 1:1.5
MOC:	
Plate:	SS 316 plates of 0.6 mm thickness
Gasket:	NBR Rubber (SNAP/CLIP ON) gaskets except heating section where it shall be EPDM.
Frame:	SS-304 clad carbon steel frame on 304 ball feet.

Others:	
Ports	Necessary ports/connections for temp. / Pressure sensing to be provided.
Accessories	SS floor plate, Name plate, Connection name plate etc.

Curd Milk pasteurizer will have the following items:

A. Balance Tank: QTY. – 1 No.

Capacity	Suitable
Quantity	1 No.
Construction	Vertical, Closed type, Cylindrical, Sanitary design with 100 free Board, atmospheric pressure.
MOC:	
Shell	AISI 304
Ports:	
Inlet	Top Inlet (No Foam Type)
Outlet	Side outlet near bottom
CIP Port	Spray ball, AISI 304.
Level probe/sensor/transmitter port	Yes
Control & Instrumentation:	
Tank shall be provided with all required instruments like level switches, level transmitter etc. for critical parameter control.	

B. Feed Pump: Qty. – 1 No.

Capacity	To match the pasteuriser capacity, VFD operated
Quantity	1 No.
Type	Other details shall be as per Milk Unloading Pump.

MOC	All Product Contact Parts of SS316, non-product contact parts of SS304
Motor	3Φ, 50 Hz, IE-3, squirrel cage induction motor, TEFC, IP 55 enclosure with SS 304 shroud.

A. Flow Meter: Qty. – 1 No.

Capacity	To match the pasteuriser capacity
Quantity	1 No.
Type	Suitable

B. Duplex Strainer: Qty. – 1 No.

Purpose	To filter incoming milk.
MOC	SS 304, gasket of food grade nitrile rubber.
Type	Duplex, PIP type with auto valve-based change over facility through selection from SCADA.

C. Booster Pump: Qty. – 1 Set (As per OEM).

Capacity	To match the pasteuriser capacity & maintain different pressure
Quantity	1 Set
Type	Other details shall be as per Tanker Unloading Pump.

D. Holding Tubes: Qty. – 1 No.

Holding time	10 min. to meet functional requirement
Quantity	1 Set
Material	SS – 304

E. Hot Water Generation Unit: Qty. – 1 No.

Purpose	To generate hot water required for pasteurisation.
Capacity	Suitable to generate and supply adequate hot water continuously at required temperature.
Quantity	1 No.
Type	PHE/ THE Heat Exchanger with PID based temp. Control.
Service	Dry Saturated Steam 3.5 kg/cm ² (g)
MOC:	
Plates	SS 316 plates of 0.6 mm thick/SS 316 tubes
Frame	Free standing SS 304 clad carbon steel frame on SS 304 adjustable ball feet/AISI 304 shell.

Gasket	Snap/clip ON type of EPDM.
Others:	
Ports	Necessary ports/connections for temp. / pressure sensing to be provided.
Accessories	Automatic Online soft water make up arrangement, expansion vessel, safety valve, air vent, SS floor plate, Name plate, Connection name plate etc.

A. Hot Water Pump: Qty. – 1 No.

Purpose	To circulate hot water through pasteuriser PHE.
Capacity	Suitable
Type	Centrifugal type pump.
Quantity	1 No.

B. Automatic Condensate Pumping Trap for Condensate Recovery: Qty. – 1 No.

Purpose	To recover the condensate from Pasteuriser
Capacity	Suitable

Instrumentation:

Temperature indication to monitor temp. at critical points should be provided. However, thermowell should be provided at each inlet & outlet of PHE. Pressure transmitted transmitters for critical points should be provided to prevent entry of utility and unpasteurised products into pasteurised product.

Others: Automatic flow diversion valves for hot & chilled flow, constant pressure modulating valve, audio visual alarm etc. Hot flow diversion valve arrangement should be provided (Configuration of Flow Diversion Valve shall be as OEM).

Tools: Essential special tools should be supplied with the plant.

PASTEURIZED RO WATER TANK

Functional Requirement:

These shall be used as a Past Water Storage Tank.

Quantity	:	As Per BOQ
Capacity	:	15KL
Type	:	Insulated
Construction	:	Vertical, Cylindrical, Double walled, sanitary design with 100 mm free board, atmospheric pressure. MOC:
Inner	:	AISI 316, inner cylindrical shell 3 mm thick including top & bottom cone, original mill finish/Polished to 150

Outer	:	AISI 304, cylindrical shell 2.5 mm thick, top & bottom cone 3 mm thick; Original mill finish/Polished to 150 G.
Insulation layers:	:	PUF of adequate thickness & density.
Bottom support:	:	AISI 304 legs with SS 304 height adjustable ball feet
Ports:		
Inlet:	:	Common inlet cum outlet valve.
Outlet:	:	
Air vent:	:	AISI 304 with drain tray & pipe up to tank bottom
Man way:	:	Top man way with Neoprene/Nitrile rubber food grade gasket.
CIP Port:	:	Suitable, AISI 304
Sight cum Light Port:	:	AISI 304 with toughened glass & LED lamp with on/off switch mounted on lamp shade.
Level probe/sensor/ transmitter port	:	Yes
Temperature sensor port:	:	Yes
Control & Instrumentation:		
Tank shall be provided with all required instruments like level transmitter, level switches and temperature transmitter, proximity switches on manhole etc. for critical parameter control and monitoring.		
Accessories:		
Top Railing	:	AISI 304 pipe with SS304 toe guard.
Lifting Lugs:	:	Yes AISI 304

WATER TRANSFER PUMP (VFD OPERATED):

Quantity	: As per BOQ
Capacity	: 20 KLPH (VFD Operated)
Type	: Centrifugal, VFD Operated & quick opening sanitary type fitting, mono-block construction, free standing with adjustable ball feet.
MOC	: All Product Contact Parts of SS 316, Non-Product contact parts of SS 304. Gasket of food grade nitrile rubber.
Motor	: 3Φ, 50 Hz, IE-3, squirrel cage induction motor, TEFC, IP 55 enclosure with SS 304 shroud.

BLENDING SECTION

Blending Tanks (Common for Fermented/Non-Fermented & Juices)

Functional Requirement: These shall be used as Blending Tank for Fermented/Non-Fermented/Juices for Final Batch Preparation.

Quantity	: As Per BOQ
Capacity	: 15KL
Type	: Insulated & Top mounted Agitator Bidders note Agitator design shall be compatible to handle Dairy base fermented /Non-Fermented & Clear Juices products.
Construction	: Vertical, Cylindrical, Double walled, sanitary design with 100 mm free board, atmospheric pressure.
Inner	: AISI 304, inner cylindrical shell 3 mm thick including top & bottom cone, original mill finish/Polished to 150
Outer	: AISI 304, cylindrical shell 2.5 mm thick, top & bottom cone 3 mm thick; Original mill finish/Polished to 150 G.
Insulation layers:	: PUF of adequate thickness & density.
Bottom support:	: AISI 304 legs with SS 304 height adjustable ball feet
Ports:	
Inlet:	: Common inlet cum outlet valve. Or Separate as per OEM
Outlet:	: Design.
Air vent:	: AISI 304 with drain tray & pipe up to tank bottom
Man way:	: Top man way with Neoprene/Nitrile rubber food grade gasket.
CIP Port:	: Suitable, AISI 304
Sight cum Light Port:	: AISI 304 with toughened glass

Level : Yes
probe/sensor/
transmitter port
Temperature sensor : Yes
port:

Control & Instrumentation:

Tank shall be provided with all required instruments like level transmitter, level switches and temperature transmitter, proximity switches on manhole etc. for critical parameter control and monitoring.

Accessories:

Top Railing : AISI 304 pipe with SS304 toe guard.
Lifting Lugs: : Yes AISI 304

RECIRCULATION PUMP (VFD OPERATED):

Quantity : As per BOQ
Capacity : 25 KLPH (VFD Operated)
Type : Centrifugal, VFD Operated & quick opening sanitary type fitting, mono-block construction, free standing with adjustable ball feet.
MOC : All Product Contact Parts of SS 316, Non-Product contact parts of SS 304. Gasket of food grade nitrile rubber.
Motor : 3 Φ , 50 Hz, IE-3, squirrel cage induction motor, TEFC, IP 55 enclosure with SS 304 shroud.

BATCH MIX HEATING/COOLING PHE:

Quantity : As per BOQ
Capacity : 25 KLPH
Type : PHE with PID based temp. Control
Section : Two Section PHE
MOC : SS 316 plates (0.6 mm thickness)
Gasket : Both side EPDM gasket
Ports : Necessary Ports / connections for Temp. / Pressure
Sensing to be provided
Accessories : SS floor plate, Name plate, Connection Name Plate and all

Application : The Common PHE design for both heating and Cooling Purpose
To heat Milk /Water Slurry from 4 to 70 Deg and again cool down to less than 6 Deg.

Hot Water Generation Module THE based

Quantity	1 Set
Capacity	Suitable to generate and continuously supply adequate hot water at required temperature.
Type	Heat Exchanger THE/PHE
Service	Dry Saturated Steam 3.5 kg/cm ² (g)
MOC:	
Plates/Tubes	SS 316 plates of 0.6 mm thick/SS 316 tubes
Frame	Free standing SS 304 clad carbon steel frame on SS 304 adjustable ball feet/AISI 304 shell.
Gasket	Snap/clip ON type of EPDM.
Others:	
Ports	Necessary ports/connections for temp. / pressure sensing to be provided.
Accessories	Automatic Online soft water make up arrangement, expansion vessel, safety valve, air vent, SS floor plate, Name plate, Connection name plate etc.

APT for Condensate Recovery:

Capacity	To meet the functional requirement
Quantity	1 Set
Type	Suitable to avoid Steam Losses

Hot Water Pump (Centrifugal Type):

Capacity	Suitable for above THE/PHE
Quantity	1 Set
Type	Centrifugal Type

High Shear Mixer/Powder Blender for Blending Section

Capacity : 2000 Kg/hr.

Quantity : 1 No.

All parts in contact with the product are made from stainless steel 304.

TECHNICAL DETAILS

Surfaces:

Inside polished with smoothly ground welding seams to $Ra \leq 0,8$

Outside ground, $Ra \leq 1,6$.

All inlets are side mounted or mounted on bottom cone.

Pipes and connections are:

Inlet/outlet pipes: ISO 2037

Connections: SMS unions

Powder line, pipe: ISO 2037

ACCESSORIES:

- 2- Ø200 mm turbo unit with water flushed mechanical shaft seal.
- 1 - Bottom mounted water flushed Turbo unit below tank.
- 1 Hopper-200L
- 1 - Grill mounted at the top of the mixing Tank for proper dosing of powder ingredients
- 2- Safety Switch
- 1 - Frame in stainless Steel
- 2- Manual Product Valves
- 2- Platform to place 2 nos. bags and unloading powder into hopper manually

High Shear Mixer Outlet Pump (VFD OPERATED):

Quantity : As per BOQ

Capacity : 25 KLPH (VFD Operated)

Type : Centrifugal, VFD Operated & quick opening sanitary type fitting, mono-block construction, free standing with adjustable ball feet.

MOC : All Product Contact Parts of SS 316, Non-Product contact parts of SS 304. Gasket of food grade nitrile rubber.

Motor : 3Φ, 50 Hz, IE-3, squirrel cage induction motor, TEFC, IP 55 enclosure with SS 304 shroud.

Duplex Strainer

QTY : As per BOQ

Capacity : Suitable

Material of construction: Liquid contact parts metal in stainless steel 316

Type: Pipe in Pipe Type

Magnetic trap

Capacity : As per BOQ

Quantity : As per BOQ

Type : magnetic type to remove ferrous

objects MOC : SS 304

Strength : 11400 Gauss Minimum

Product Transfer Pump for UHT (VFD OPERATED):

Quantity : As per BOQ

Capacity : 5KLPH (VFD Operated)

Type : Centrifugal, VFD Operated & quick opening sanitary type fitting, mono-block construction, free standing with adjustable ball feet.

MOC : All Product Contact Parts of SS 316, Non-Product contact parts of SS 304. Gasket of food grade nitrile rubber.

Motor : 3 Φ , 50 Hz, IE-3, squirrel cage induction motor, TEFC, IP 55 enclosure with SS 304 shroud.

CIP Retrurn Pump for Blending Tanks

Capacity	:	Suitable
Quantity	:	1 No.
MOC	:	All product contact parts in AISI 316
Type	:	• Self-priming centrifugal monoblock with mechanical seal • Free standing with adjustable ball feet • EPDM gasket
Motor		415 V AC, 3 Phase, 50 Hz, induction motor with TEFC/IP55 enclosure with SS 304 Shroud IE3 efficiency.

BLENDING PLANT CIP KITCHEN (2 CIRCUIT)

Quantity: 1 Lot
As per general description given in basis of design.
No. of CIP supply circuits shall be 2(Two). Capacities of CIP tanks as per specified in basis of design. SS-304 platform is included in the scope.

UHT PROCESSING SECTION

Capacity: Steriliser 4400 LPH with homogenizer (variable capacity up to 2200 LPH)

Quantity : 01 Set

Product : White milk/milk-based drinks/lassi (as per design basis). Steriliser will be used for white milk and the other products mentioned may also be processed as per requirement

Temperature programme: For white milk: 5-137/4s-80H-25° C

For lassi: 10-98/30s-65/70H-28° C

For Flavoured milk:10-137/4s-75H-28° C

For salted butter milk: 10-98/30s 65/70H-28° C

Clear Juice:15-98/30S 60/70H-28° C

Type: Modular design, indirect heating, tubular heat exchanger based, with preheating, regeneration, sterilization, holding and product cooling sections. The system should have 1st stage upstream and 2nd stage downstream homogenisation of product.

Protein Stabilization temp. & time: As per bidder's design with bypass facility & min.90 – 120 sec. holding.

Heating Medium: Hot water/steam. Hot water will be generated from hot water generators.

Cooling Medium: Cooling Water from cooling tower. Complete

Design of cooling tower with pumping shall provide by Purchaser as per requirement by Supplier.

Operating Mode: Milk heating/cooling to filling temperature and temperature control will be automatic. Sequencing of production, sanitization and CIP will be done by the PLC once the operator has selected the required function from the HMI. Detergent addition in the balance tank and concentration monitoring will be automatic.

Controls: The complete sterilizer should be controlled through a PLC based control panel for process as well as automatic CIP, with HMI display screen, audio visual alarm and communication ability with the automation system of the plant (SCADA). All appropriate instruments (sensors and transmitters) for measurement of all process parameters viz. temp, pressure and flow with local digital display and communication with PLC and temp. recorders.

Other items & accessories:

Closed Product balance tank with level controller & CIP device

Flow meter for product and Conductivity transmitter for CIP.

Centrifugal pumps for product & utilities (with VFD wherever required)

Strainer placed after the Product pump shall be provided to remove unwanted particles from the incoming product.

Tubular Heat exchanger of MOC AISI 316L

To have Floating Protection System for THE tubes to absorb thermal stress which improves sterilizer life.

Back flush arrangement system shall be provided

Hibernation during water circulation in sterilisation mode

Homogenizer connection with pneumatic, remote-controlled valves

Deaeration system with manual Vacuum with Automated by-pass of deaerator

Correction Heater for Deaeration system.

Correction arrangement to maintain the specific temperature with holding time at different speeds

Differential pressure control between product and utility

Product piping in AISI 316

Set of pipes, valves, fittings

Prewired signal/power cables

Control panel with PLC & HMI mounted on main module

Air cooling unit for control panel if required

Engineering, Programming, technical documentation

The sterilizer with all accessories should be mounted on common SS base frame. Signal cabling between Sterilizer, Aseptic Buffer Tank & Aseptic Filling machines would be provided.

UHT Aseptic Homogenizer with VFD

Fun. requirements	:	This machine would be used for breaking and dispersing the fat globules in whole milk and standardized milk homogeneously.
Capacity	:	2200-4400 LPH with variable speed drive
Quantity	:	1 no.
Design parameters		
No. of Stages	:	2 stages
Working pressure	:	250 bar max.
Homo. efficiency	:	Min. 95 % by CI method/ Nizo efficiency of over 70 %
Homogenizer head	:	It should be energy saving, removable type. Homogenizing device shall be made of wear resistant material.
Cleaning:	:	The homogenizer should be suitable for CIP cleaning in line with the sterilizer.
Motor	:	3 Φ ,50 Hz of Suitable rating, IE3(min.)
Scope of supply		
High pressure pump block	:	One piece cylinder block of forged stainless steel with quick change piston seal cartridge system, replaceable suction and discharge reversible valve seats.

The valves	: The homogenizer valves should be made of stellite/tungsten carbide material to handle low/high viscous products.
Accessories:	
Inlet / outlet	: Of suitable size.
Pressure adjustment	: Hydraulic pressure actuation unit should be provided for adjustment of the homogenizing pressure.
Pressure gauge	: Flat diaphragm type, range 0-250 kg/cm. sq. for the first stage.
Lubricating system	: Forced lubrication system – With Oil pressure gauge, oil filter and cooler and low pressure switch OR Splash type.
Cooling water system	: Closed loop cooling water system for cooling piston seals for longer life, cooling of crank case oil and gear box oil. The cooling water shall be produced by condensing steam in a heat exchanger fitted in the homogenizer
Drive unit	: Whole Crank Shaft drive installed in closed housing of CI. Power transmission from the motor to crank shaft via V belts and shaft mounted reduction gear box.
Pulsation dampers	: 2 No at the inlet and out of products
Electrical equipment	: Emergency switch. Start/stop button. AC motor for hydraulic drive. Terminal box inside and wiring. SS Starter panel with frequency drive.
Others	: • Lubrication oil • Oil filling for hydraulic unit and reduction gear • Oil level sight glass and oil temp.gauge mounted on machine housing.
Tools	: Essential special tools should be supplied with the module.

1.0 ASEPTIC STORAGE TANK:

Quantity- 01 No

Capacity : 20 KL

Type : Aseptic design, cylindrical

Aseptic buffer tank system used for intermediate storage of liquid foods including Spiced Butter milk with max. salt content 0.49% with spiced particles and other fermented products during aseptic conditions in order to maintain production security conditions and product quality as well as contribute to total line flexibility.

This is achieved by balance product supply and product demand, between aseptic packaging and processing.

Sterile tank shall have following items:

- Process and control module
- Tank body
- Interconnecting piping
- Agitator suitable for Salt content Spiced Butter milk & other fermented products

The process and control module

This module shall contain the sanitary/aseptic product valves with steam/condensate barriers to receive the product from the UHT processor and to deliver the product to the aseptic filling machine. The CIP valves shall also be mounted in this module. All sanitary & aseptic valves shall have valve position feed-back initiators.

The valves shall be opened and closed by means of compressed air (supplied via solenoids). In addition, the module shall include the utility valves for steam, sterile air, cooling water and CIP liquids.

The compressed air for the sterile tank shall be sterilized by passing the air through the double sterile filter set. These filters shall be mounted in the process module and shall be steam sterilized in counter flow during the SIP process, together with the rest of the installation.

The compressed air unit with a stainless steel junction box, incorporating compressed air distributors, auxiliary solenoid valves, pneumatic tubing and wiring, and air-filter, air pressure reduction valve and distribution blocks shall be mounted on this stainless-steel frame.

The various field mounted transmitters for control and recording the critical parameters shall also be housed in the process module frame, easily accessible for maintenance, to check and to calibrate.

CIP process of the sterile tank shall be carried out by the New CIP system for Aseptic Tank Cleaning.

The control panel shall be mounted in the process module, which shall include the

HMI and, the main power switch and the distribution lines.

The controller of the sterile tank controls and monitors the various steps as well as times, temperatures for each CIP step (Pre-rinsing, alkaline/acid solution, circulation, final rinsing and the concentration of the cleaning solutions).

Tank body

The body of the Sterile tank shall be fabricated from stainless steel suitable for salt resistant material and supported on 3 or 4 legs as per OEM design. The level in the tank shall be measured by applying one load cell at one of the legs or appropriate measuring devices. The double wall shall be used as a cooling jacket by applying cooling water from the top or from bottom.

Sterile tank shall have a spherical bottom. A spray ball shall be provided at the top of the tank to ensure proper CIP liquid distribution for cleaning of the tank inside. Agitator shall be installed in the top or bottom as per OEM design by considering the targeted product will be Spiced buttermilk and other fermented product.

The Sterile tank body shall have a "Full Vacuum" design to prevent collapsing in case of pressure drop, whereas the over pressure overshoot shall be safeguarded with pressure relief valve or safety valve. Internally, the body shall be grinded to #4 according to EHEDG/3A.

The piping for cleaning liquids, sterile air, and cooling water return between the tank body and the process frame shall be mounted alongside the tank with a stainless steel cover.

Interconnecting piping

The interconnecting piping between the process module and the sterile tank shall be fully pre-mounted and shall be part of the scope of supply.

Aseptic sterile tank shall have following design and features:

- Vertical tank with cylindrical inner container in Stainless Steel suitable for salt content mentioned above. MOC shall be SS316 L
- Separate product inlet & product outlet of sterile tank.
- Cooling jacket for cooling of the tank after sterilization. Designed to work under atmospheric pressure only.
- SS platform with safety rail having toe guard, placed on the top of the tank, for personal safety and easier maintenance. SS ladder with cage & ladder step must be anti-slip with falling protection for personal safety.
- Manhole and manhole cover on top subject to design of OEM
- CIP nozzles.
- Three or four leg with adjustable ball feet
- Equipment for volume indication by weight or appropriate measuring device.
- Connections for product, cooling water, air, CIP liquid and steam.
- Valve cluster module with pre-assembled valve clusters including safety device and air pressure equipment for emptying of the sterile tank
- End valve cluster with control box to be placed after filling machines.
- Control panel system, mounted on valve cluster module. I/O communication to be provided
- Communication with filling machines.
- Communication with sterilizer.
- Communication with Pre-process recovery section.
- Communication with Sterile tank CIP module. Sterile tank shall act as slave during CIP. This means the CIP station will control circulation times, CIP - Liquids, when to make flips and when CIP will be done.
- Human-Machine-Interface(HMI)
- Data logger for logging of CIP time, Sterilization time, Production time, critical parameters (CCP/OPRP/CIP parameter), instrument trends, alarm history, CIP parameters event log storage up to one year.
- Pre-assembled valve cluster along with sterile tank.
- Culinary Steam filter
- Steam pressure reducing station including PRV.
- Panel air conditioning unit for control panels shall be provided for required temperature protection of PLC and other electrical components of the panel.
- Propeller agitator with aseptic shaft seal.
- Low level switch shall be provided to detect tank empty installation of low level switch shall be as per OEM standard

Working Principle:

Tank operation shall be fully automated and production interlocks will be included for safety reasons. The operator only has to initiate the process steps: Tank sterilization, Production, CIP & SIP.

The tank shall be operated from its own programmable control in the control panel.

The control system shall realize a controlled automatic rundown of the entire process as well as a synchronization of the sterile tank with filling machine and sterilizer.

The process should encompass various safety devices. When these safety devices shall trigger, a message is activated on the control panel.

The process has been categorized into the following four main phases:

- Sterilizing in Place(SIP)
- Production
- Cleaning in Place(CIP)

Sterilising in Place (SIP)

The Sterile tank shall be sterilized prior to the start of the actual product ion run. The sterile tank and the product piping to the Aseptic filler shall sterilised by means of saturated steam at a minimum temperature of 125°C for a period of time

The sterilization time, temperature and air pressure shall be critical control points that shall automatically controlled and monitored. De-aeration of the piping and the air-filters shall key sinthis process step. So ensuring that no air locks in the system should be present, which could jeopardize the sterilization process.

The condensate shall discharged via automatic valves and pumping traps.

At the end of the sterilization step,the sterile tank and product piping gets sterile.

The steam supply will close, and the cooling starts with cooling water in the jacket which will introduced at the bottom and gradually rise to the top via the crevice between the inner and outer wall.

During cooling the tank and piping shall pressurize with sterile air to prevent vacuum formation.

Production

After cooling, the sterilised product shall be supplied via automatic valves. These valves shall open upon the signal from the sterilizer control panel that the product shall be at the valve upon which the tank will gradually filled with product.

The product level in the sterile tank shall be measured by a load cell. During use, the tank space above the product level shall be filled by pressure- controlled sterileair. The air pressure shall be used to deliver the product to the Aseptic filler. The pressure shall automatically controlled to maintain the feed pressure required by the filling machine in operation. When the level rises, air shall be released and when the level lowers sterile air enters the sterile air to maintain the filling pressure.

Agitators shall be used for proper mixing of products, to avoid separation in the tank during storage and there is no any separation at the end of production.

One of the three stainless legs shall be equipped with a load cell which measures the content of the tank and shows the reading on the panel.

A valve cluster module with control panel shall direct product flow, sterile air, cleaning liquids and steam. During production a steam barrier (>110DegC) will applied to protect the product from contamination. After the filling machines, the end valve cluster prevents re-infection. Sterile tanks shall be designed to achieve continuous production run of Minimum 144 Hrs without CIP/SIP.

Facility for sterilerinsing shall be provided while switching from one product toother.

At the end of the production run or when the product reaches the lowest level, the supply to the fillers hall stopped. The tank either goes on hold waiting for newproduct or will be cleaned or aseptic rinse.

Aseptic rinsing of sterile tank

Facility for sterile rinsing shall be provided.

Whenever we required to continue production from sterile tank at a time of product or flavour change in running product from tank at that time without taking full CIP of sterile Tanksystems should having facility to clean tank by sterile water rinsing from spray ball by using of sterilizer sterile water.

Cleaning in Place(CIP)

The tank shall cleaned in place by a dedicated CIP system for the Sterile Tank. There shall be Single Circuit CIP system for Aseptic Tank and Aseptic filling line.

The cleaning of the sterile tank, product pipes and valves shall be automatically. Since tank operation includes high sterilization followed by cooling, the tank shall designed to be completely implosion-proof.

CIP module shall take care and CIP program steps shall be controlled by this module.

CIP module shall be the master and the tank will be the slave only opening / closing of the product valves, Flows, Times, Temperatures, Concentration and program sequences shall determined and controlled by the CIP module.

The CIP liquids shall supplied via a spray ball arranged at the top of the Tank. The CIP solutions shall diverted via a valve group and clean the sterile tank and its product piping to and from the Aseptic Filler. Valve seats shall be cleaned by lifting the valves shortly in apre-defined sequence.

During CIP of the sterile tank filliping of valves to clean valve seats & other pipes by controlling Sterile tank system. It will not control by CIP module.

After the CIP the Steriletank will goes in to the stand by mode.

Installation of flow plate & complete piping including pipes & fittings for supply and return between CIP modules to Aseptic Sterile tanks are in the scope of supply

According to distance of filling machine flow plate & end valve cluster to cip unit Suitable capacity CIP return pump for sterile tank shall be provided by bidder.

CIP Plant for Aseptic Equipment cleaning

The tank shall clean in place by a dedicated CIP station for the steritank. There shall be Single Circuit CIP station for Aseptic Tanks Cleaning and filling line.

CIP Plant Plant characteristics

- Cleaning ring system for cleaning of the aseptic tank with a controlled phase break between the different cleaning agents by a conductance measuring system.
- Automatic re strengthening of the caustic and acid solution with a conductance control.
- Automatic temperature control and heating by plate heat exchangers.

Technical specification

CIP plant (2 vessels) for continuous operation with 1 Circuit line cleaning

- Feed quantity: approx. 15000 l/h
- Input pressure feed: approx. 3 bar
- Cleaning temperature: max. 85°C

- Components to be cleaned: sterile tank and product piping up to filler.

Specification of the scope Supply consisting of:

Quantity Total volume Content

1 approx. 2000 L caustic solution

1 approx. 2,000 L acid solution

1 approx. 200 L Recirculation Tank

Each tank is equipped with:

1 Overflow

1 Outlet connection piece for emptying by means of manual butterfly valves
1 Inlet connection piece for fresh water

1 Inlet and outlet connection piece of the corresponding cleaning ring system

Material of construction:

Acid and caustic Tanks: Insulated with inner shell in SS304 for Caustic tank and SS316 for Acid Tank with cladding in SS304

Cleaning circuit components:

1 Set of manual butterfly valves & pneumatically controlled butterfly valve

1 Stainless steel centrifugal pump

1 Conductance measuring for the phase break of the different agents

1 Duplex Pipe in pipe filter in return line with manual butterfly valves for change over.

2 Magnetic flow meters (1 in forward and 1 in return line)

Heating unit by plate heat exchangers consisting of:

1 Steam control (PID) valve with a manual valve also prior to steam control valve.

1 Float type Steam trap

1 Tubular heat exchanger

Control unit: The temperature control of the different sections is carried out by a temperature measuring system which opens and closes the steam feed valves by the signal output of a limit value.

Stainless steel cabinet

Inside equipped with installation plates, on which the following devices are installed:

- PLC Panel

- Power section (motor protective switch, contactors)

- Power supply, fuses, clamping rails etc.

The following programmes are realized by the PLC:

- Required concentration of the cleaning agents
- Cleaning caustic solution
- Cleaning acid solution and
- Hot water

The following is signalled as an alarm, and CIP shall be paused till the required parameters are achieved:

- Running dry of the pumps
- Conductivity not reached
- Temperature not reached (return)
- Flow is not attained

The CIP parameters shall be logged in the system for MIS purposes.

Aseptic Product piping & cip solution piping

Installation of aseptic product piping & fittings from sterilizer to sterile tank, sterile tank to aseptic filling machine and cip solution supply & return line installation, commissioning & validation is in scope of supplier.

All required pipes & fittings should be made from suitable stainless steel as SS316 targeted product is spiced buttermilk having salt content 0.49%

Addition of flow plates in existing system, required valves & fittings is in scope of supplier. Product recovery from sterile tank to existing product recovery tank Required Piping, mixproof/ single sheat valves & fittings is in scope of sterile tank supplier.

Utility Connections

All utility connections for New Sterile tank is in scope of sterile tank supplier. All utilities are available at plant level further distribution will be in supplier scope. For power will be connected from existing feeder for New Sterile tank Panel and CIP return pump further distribution with cable tray and support is in supplier scope. Supplier can use existing earthing for New Steri tank and if separate earthing is required in that case supplier need to make new earthing pit and distribute to the required load points.

Below Sterile tank valve cluster filling or end valve wherever steam trap is directly open on floor need to installed SS collection plate with proper slope and drain to nearest point.

Control and automation system:

PLC and HMI based control system for fully automatic PLC based operation shall be provided. All component of control system shall be housed in a SS cabinet having IP54 protection. Required hardware and software is to be provided. Panel units shall be supplied for control cabinet to operate under higher ambient temperatures.

Preferred PLC & HMI make: Siemes/AB

Supplied PLC & automation hardware & soft ware should be latest version Control system shall have facility of data logged up to 1 yrs.

The System is operated automatically via PLC. Components for Automation are installed in a switchboard cabinet (Material: AISI 304, Protection IP54). Supplier shall provide UPS with 30 min back-up of suitable capacity for power supply of control system. During Power Failure Steril tanks should be capable to maintain sterile condition inside The Tank

and same product can be pack after power restore to avoid excess product recovery during power failure.

Interfacing of this standalone control panel of Aseptic sterile tank shall be done with filling machine and Sterilizer control panel. Supplier of sterile tank shall responsible for providing data/signals in required form for this integration/communication. Required hardware/converters/communication cable (upto third party panel for Upstream & downstream communication) for providing data/signal in required soft form is in the scope of the sterile tank supplier.

Signal Exchange Communication with third party equipments

Supplied sterile tank communication with third party like Sterilizer, aseptic filling machines, &Preprocess recovery section is in scope of supplier.

Addition of hardware & communication cables in existing system is in scope of supplier. Other modification in software of existing system is in scope of COMFED.

SCOPE OF WORK:

Unloading of Equipments, unpacking, shifting & Positioning, Installation and commissioning in bidder scope.

RINSE MILK RECOVERY & TRANSFER SECTION:

RINSE MILK RECOVERY & TRANSFER SYSTEM

A Quantity: 1 Lot

s per general description given in basis of design along with a transfer pump (VFD operated/5 KLPH) & a magnetic flow meter. The system shall comprise of 500 L capacity rinse milk collection/balance tank, 5 KLPH transfer pump & chiller (5 KLPH) & Insulated Storage tank of 3 KL shall be supplied. CIP return pump of suitable capacity is also included in scope.

3.0 SPARES - Quantity- 01 Lot

Following spares is part of the scope of supply:

- Complete set of Critical Equipments for UHT processing (UHT Sterilizer, Aseptic Homogenizer & Aseptic Tank) spares and services required for operation and maintenance for & up to 6000 hours (As mentioned in the Maintenances module is in the scope of supply).
- This shall be quoted afterservice cover.
- In addition to that following spare required to be supplied:
- Mechanical seal for agitator-01No
- Mechanical seal for of pump-01No of each type seal.
- One number of each type of Input/output card (except main controller) of control panel
- One no. of each type of communication hardware which is installed for third party communication.
- Required special tools for maintenance of sterile tank.

Coordination with Pack-1 supplier

Pack-2 to supplier to coordinate with pack-1 supplier for following minimum envisaged works.

- Receiving standardized sterilized product from UHT sterile tank to aseptic packaging machine with the flow rate as required by the pack to supplier. Signal exchange shall be established between Pack-1 supplier PLC and Pack-2 supplier individual aseptic filling machine for product transfer at the required flow rate temperature and pressure.
- Collection of all production data from the aseptic packing machine and providing Pack-1 MIS system for the same.
- Receive all required utilities such as steam , FW/RO/SW water , Chilled water forward and return, compressed air, electrical supply till termination from the pack 1 IMCC, Automation and automatic transfers, etc to the aseptic packing machine including steam with culinary filters as required.
- Communication with aseptic packaging machine PLC for production , transfer of products, CIP of aseptic packing machines data acquisition etc all
- Pack-2 supplier shall provide assistance during commissioning of the entire plant including aseptic packing machine , UHT and sterile tank system commissioning.

3.3 ELECTRICALS:

Electrical Distribution System

The electrical distribution system shall be designed to operate, control, and maintain all parameters required for the following plant processes and utilities:

- Blending & Beverage Preparation Section and transfer to sterilizer
- Processed milk storage and transfer to sterilizer
- UHT (Ultra-High Temperature) treatment system
- Raw or UPS Power supply to APS section upto the consumption points of each equipment
- IMCCs and associated plant equipment
- Other process and utility systems as required

Intelligent Motor Control Centers (IMCCs) and MCCs

Intelligent Motor Control Centers (IMCCs) and Motor Control Centers (MCCs) shall be provided with the required number of feeders and shall include:

- Intelligent switchgear
- Variable Frequency Drives (VFDs)
- Soft starters
- Communicable/protective relays
- Push buttons
- LED indication lamps
- Display units
- Auto/Manual selector switches
- All necessary control and protection accessories

Control and Operation Requirements

The system shall provide facilities for operation and control of all electrical motors through:

- Operator Stations (OS) located in the control room
- Remote push-button stations (Emergency stop only)
- Local control stations, where required
- Communication interfaces with the plant automation system

Design Objective

The complete electrical and control system shall ensure:

- Safe plant operation
- Reliable process control
- Effective monitoring and diagnostics
- Ease of maintenance
- Continuous and efficient operation of the plant

3.4 AUTOMATION & INSTRUMENTATION:

Control & Automation System (C&A) Requirements

Control System Requirements

The entire Control & Automation System (C&A) shall be based on a **Distributed Control System (DCS)** or an **equivalent high-end PLC system** incorporating standard DCS functionalities.

The UHT plant Automation shall communicate with Pack 2 (APS) for seamless handshaking required for transfer of products and CIP return arrangements.

Line supervision and Monitoring system

For entire Aspheric filling line , OEM based software and automation system shall be used. The Pack-1(Preprocessing & UHT) system shall enable centralized collection of information related to productivity of each machine in the line. Pack-2 (APS) supplier needs to do handshaking and establish communication with pack-1 (UHT) PLC and MIS system to smoothly transfer different products / CIP as mentioned in the tender.

The control system shall:

- Standalone type / Non-redundent type (at CPU , Power supply and communication level)
- Provide comprehensive process control capabilities, including standard **auto-tuned PID loop control**.
- Support multiple programming languages, including:
 - Function Block Diagram (FBD)
 - Structured Text (ST)
 - Ladder Logic (LD)
- Allow development and integration of all the above programming languages within a single application.
- Permit **online development and modification** of application programs without interrupting ongoing plant operations.
- Include a comprehensive instruction set for:
 - Process control
 - Mathematical calculations
 - Logical operations
 - Signal filtering
 - Timing functions
 - Comparisons and decision-making
- Enable users to create custom instructions/functions and reuse them throughout application programs.
- Support both:
 - Direct online programming
 - Offline program development using engineering/programming workstations
- Provide advanced engineering tools for:
 - Programming
 - Editing
 - Monitoring

- Uploading/downloading applications
- Retain application software and configuration data during power failures through non-volatile storage.

Visualization and HMI Requirements

The control system shall include visualization software capable of advanced graphical plant operation displays.

The visualization software shall support:

- Dynamic value display
- Color changes based on process conditions
- Line and object animations
- Blinking/alarm indications
- Global object management without individual modification
- Recipe management
- Event triggering and logging
- Calculations
- Real-time process monitoring

Additional requirements:

- Preconfigured faceplates for common control modules.
- Real-time and historical trending capabilities.
- Data collection and archiving functions.
- Graphical Sequential Control implementation.
- Sequential diagnostic information available to operators.

Communication Network Requirements

The control system network shall:

- Be based on open, high-speed industrial communication standards.
- Utilize fiber-optic communication wherever required.
- Support future expansion without major modifications.
- **15%** spare I/Os installed and wired , **40%** spare memory for main DCS/PLC CPU, **35%** spare SCADA tags in the main CPU
- Use industrial-grade managed Ethernet switches.
- Provide comprehensive diagnostic information including:
 - Network health status
 - Communication statistics
 - Network loading information
- Make network diagnostics available through operator workstations.

Field Communication Requirements

The system shall utilize deterministic and open communication protocols for communication between controllers and field I/O stations.

Supported protocols shall include, but not be limited to:

- Profibus DP
- Profibus PA

- Profinet
- Ethernet TCP/IP
- Industrial Ethernet/IP
- ControlNet
- DeviceNet
- Modbus
- AS-i (Actuator Sensor Interface)

The system shall support seamless integration with:

- Field instruments
- Intelligent devices
- Third-party PLCs
- Third-party DCS systems

using open communication standards.

MIS and Cyber security Requirements

A web-based **Management Information System (MIS)** with Internet connectivity shall be designed, engineered, supplied, and commissioned.

The MIS system shall:

- Be protected by a hardware-based firewall.
- Collect all MIS-related data from a dedicated communication module of the DCS/High-End PLC.
- Support centralized monitoring, reporting, and analysis.
- Include hardware and software security measures to prevent:
 - Unauthorized access
 - Unauthorized modifications
 - External cyber threats
 - Unintended influence on control system operations

The architecture shall ensure secure segregation between the control network and enterprise/internet-facing systems.

System Descriptions:

1. The system must provide the highest degree of scalability possible—open, scalable, and distributed.

It shall provide scalable controllers and I/Os, all within a common design environment, as well as a scalable HMI solution with a common design environment.

The system shall be constructed to permit implementation and expansion in a phased manner, where the initial system implementation may be relatively small.

As requirements grow, the system shall accommodate the addition of HMIs, front-end computers, and field devices without performance degradation.

The system shall support:

- Extension of the field network,
- Addition of gateways to the network,

- Addition of controllers and remote I/O where required,
- Integration of third-party PLCs and computers into the system.

UHT and APS:

The process automation shall collect the required data from the UHT & APS section (Pack -2) controlling, data logging, monitoring/analysis, reporting, and feedback as per requirement. For MIS, necessary data, including production data from these sections, shall be collected by process automation systems for monitoring, logging, analysis, and common MIS report generation.

SCOPE OF SUPPLY:

Scope of Work shall cover

Design, engineering, development of control philosophy, software development, manufacture, assembly, shop testing, packing, transportation to site, unloading at site, storage, erection, site testing and pre-commissioning, commissioning, initial and successful operation, and performance testing of the entire automation system., Control and Instrumentation Package of the UHT Plant on a turnkey basis, adhering to the specifications and requirements set forth in the present document.

The bidder shall develop the application software, including the database, graphical user interface (GUI), mimic screens, trend displays, logging functions, and report generation formats, along with all other necessary software components required for the complete system

The bidder shall provide the necessary training to plant personnel on the operation, maintenance, calibration, and safety procedures of the complete automation system, as well as for all its major components, including sensors, transmitters, actuators, and other related equipment.

The bidder shall provide necessary documents which includes but not limited to:

The items you listed are typical **Control System / Instrumentation engineering deliverables** for an industrial automation project (DCS, PLC, SCADA, ESD, SIS, etc.). They can be organized as follows:

System Design Documents

- Control System Architecture
- Bill of Materials (BOM)
- Control Philosophy / Functional Design Specification (FDS)
- Specifications
- Manuals

Instrumentation Documents

- Instrument Data Sheets (all instruments)
- Instrument Index / I/O List
- Loop Diagrams

Electrical & Wiring Documents

- Cable Schedule
- Junction Box (JB) Schedule
- Wiring Diagrams

Panel & Layout Drawings

- Control Panel General Arrangement (GA) Drawings
- Remote I/O (RIO) General Arrangement Drawings

Project Completion Documents

- As-Built Drawings
- Operation & Maintenance Manuals

Typical Deliverable Sequence

1. Control Philosophy / FDS
2. Control System Architecture
3. I/O List
4. Instrument Data Sheets or make / model of instruments
5. BOM
6. Panel & RIO GA Drawings
7. Cable & JB Schedules
8. Wiring Diagrams
9. Loop Diagrams
10. Manuals & Specifications
11. As-Built Drawings

Also, submit all other necessary drawings and documents in both printed and electronic (soft-copy) formats for the purchaser's approval, in multiple sets

The bidder shall supply all necessary hardware, software, and software backups required for the automation system as per the project requirements. After commissioning, the bidder shall provide the final program backups (PLC and SCADA), along with all other as-built drawings and documentation, including but not limited to node addresses, cable schedules, scaling details, recipe parameters, and related information.

The bidder shall submit the detailed automation system configuration without deviating from the basic configuration and functional requirements. All hardware, software licenses, and source codes (except MIS) shall be transferred in the name of OMFED

It shall be the responsibility of the bidder to prepare and submit a comprehensive Corrective Maintenance and Preventive Maintenance Plan. The bidder shall also provide hands-on training on the maintenance plan and related activities for the automation system, equipment, field and control panel instruments, drives, valves, and motors. The objective is to ensure trouble-free operation and effective maintenance of the plant.

The automation system, including the Ethernet network, shall be tamper-proof and shall incorporate adequate hardware- and software-based security measures to prevent any unauthorized external access, interference, or unwarranted influence.

In addition, the automation system shall include the following:

• **Operator Station/Console PC:**

Item Specification: Type: RAM, Quantity: 1 No. ,Location: UHT Control Room, System: Core i7 Processor PC , Display: 24" Color TFT Screen , Memory (RAM): 16 GB

The OS workstation shall consist of a **24-inch color TFT LED display with keyboard and mouse**. It shall be a **high-end PC** and shall be equipped with **DVD-RW drives with backup data recording capability**. The **hard disk** shall have sufficient storage capacity to retain at least **60 days of plant data**. Suitable software shall be provided to support **multi-screen technology**..

Engineering PC cum Operating Console PC:

Quantity: 1 No. in UHTcontrolroom
 Type: Corei7Processor PC with 24"colorTFTscreen,4
 : GB
 RAM

The PC shall be similar to OSPC (22"colorTFT-LCDdisplay with keyboard & mouse) would be highend type & shall have DVD_RW drive with back-up data recording facility. Facility of operation/monitoring/control as well as engineering programming would also be required in this PC.

The hard disc shall have data storage capacity of at least **60days plant data**. Suitable software shall support multi-screen technology.

Printingof graphs/trends &reportwould bepossible from this PC.

• **MIS ServerPC :**

Quantity : 1 No. in UHT control room
 Type : Core i7 Processor PC with 22"color TFT screen, 4GB / 32
 RAM GB minimum

The client server shall be located in the UHT control room. The server shall be a high-end PC with RAID-5 hard disks, having three partitions and hot-swappable drives. The hard disk shall have a data storage capacity of at least 360 days of data. The server PC shall have a DVD-RW drive with backup data recording facility. The server shall store all relevant data from the DCS/PLC systems and all networked computers connected to it. It shall generate MIS reports as per the approved report formats from the union. The MIS system should support open protocols to ensure interoperability and integration with other systems. Printing of graphs/ trends & report would be possible from this PC.

The MIS reports shall show data and calculations based on data from the control system and historical data. The data will be communicated to the Central Automation System located in the Liquid Milk Processing section.

The displays shall show information from various parts of the plant in a hierarchical manner. Clicking on one piece of data shall bring out more details of that data.

It shall be possible for any user to design reports suitable for their job function.

A data archiving system should be designed to improve product and process quality, ensure consistency, and reduce or eliminate waste. It should also provide better control over manufacturing operations.

In addition, the system should support operating, maintenance, and management teams by enabling effective troubleshooting and facilitating continuous improvements across processes.

Increase quality by identifying process variability and its causes, and enable improvement through analysis and verification of production parameters.

Improve responsiveness to requests from customers and/or regulators regarding overall product or process quality. This is achieved more easily through maintaining an accessible online record.

Reduce overhead costs by saving time through automated data collection and the generation of relevant reports

Improve processes through the ability to easily analyze complex process data

Reliable and easy-to-configure data collection and analysis solutions ensure the right people can see the information they need to make the best possible business decisions.

Adhere to strict regulations and ensure regulatory compliance through comprehensive online recordkeeping

Remote Access Requirement:

Password-based remote access facility through the internet for viewing MIS reports shall be provided with this system.

2. Utility Consumption Data Requirement:

Section-wise (UHT Section & APS Section) utility consumption data will have to be made available in the MIS. Necessary instruments shall be installed for capturing and reporting this data.

- **Printer:**

LaserJet B/W suitable for A4 size paper– 1 No.

- **Network Hardware**

Ethernet cable / Fibre Optic cable (outside plant)– 1 Lot

Field run bus / similar bus cable– 1 Lot

Powered bus cable for valves– 1 lot

Ethernet switches (Managed)– As required

Interfacing Units for third party devices/instruments etc.– 1 Lot

Remote I/Os complete with communication & power unit– 1 Lot

Hardware based security device– 1 Lot

Other hardware– as per requirement

The hardware units shall be installed inside suitable wall/rack mounted watertight cabinets.

- **Accessories**

All junction boxes and distribution boxes for control and instrumentation systems, including cable glands, shall be of SS 304 construction.

Instrumentation and signal cables/wires shall be minimum 0.75 sq. mm, twisted pair, shielded copper cables with steel/metal braided shielded with aluminium mylar tape & ATC drain wire..

Instrumentation and signal cables shall be routed separately from power cables and shall be installed in dedicated, earthed cable trays to prevent any electrical interference.

All junction boxes (power/signal) and distribution boxes shall be provided with proper body earthing

- **System Software**

The system software shall be based on an open architecture/protocol. It shall use the latest object-oriented software, resulting in a fully scalable system. The original licensed version of the latest software release shall be used

- **MIS Software**

This shall be based on software with an open architecture/protocol. The following minimum reports are envisaged from the system. Necessary forms shall be developed on networked PCs for data entry. All reports shall be developed after discussion with the customer.

However, following minimum reports are to be considered for development.

Milk reception /storage report

Milk transferreport

CIP log report

UHT& APS processing & packing report

Solid Losses report

Utility status & consumption report

Steam/airgeneration& consumption

Power consumption (section wise or
MCC wise)

Water (raw/soft/RO) consumption
report CIP chemicals receipt v/s
consumption Maintenance Report

Inventoryreportof the plant•

ControlDesk / Cabinet

Control Desk / Cabinets – Design Requirements (UHT Control Rooms)

Control desks and cabinets are required for the control rooms of the UHT system. The design of all consoles, panels, cabinets, and overall layout shall follow best ergonomic practices, ensuring full consideration of the comfort and convenience of operation and maintenance personnel.

Operator Consoles

- Operator consoles shall be free-standing type.
- All keyboards and cursor control devices shall be mounted on the horizontal working surface of the console.
- Monitors shall be mounted on a raised section of the console for optimal viewing ergonomics.

System Cabinets

- All system modules, power supply units, and other components required for complete system functionality shall be housed in system cabinets.
- Cabinets shall be totally enclosed, free-standing type with full-height front and rear doors.
- Cabinets shall be designed to allow:
 - Front access for system modules
 - Rear access for wiring and cabling

Construction and Cabling

- Cabinets shall generally be designed for bottom cable entry.

- Only non-welded construction shall be used.

Constructional Features:

Modular steel internal Structure
Wood/metalwork surface
Powder coated MS structure
Under Counter key board trays
Slide out CPU shelves

Footrest

Telephone mounting shelves
Binder storage

Under counter pencil trays
Printer table

Chairs 4Nos.

Every control cabinet/metallic desks shall be provided with proper earthing facility.

Bidder to seek approval for control room furniture prior finalization.

• **Control philosophy**

The bidder may propose a brief control philosophy along with the bid. However, the control philosophy and process logic will be finalized during detailed engineering

• **Climatic condition**

The instruments/ control system shall be suitable for environmental conditions that are normally encountered for Odisha.

• **System powersupply condition**

For applications requiring AC power, an uninterrupted power supply of 240 V AC, 50 Hz shall be provided by the supplier using a true online UPS system with three-phase input and single-phase output, complete with a common servo voltage stabilizer. UPS shall be standalone / Non redundant type with single battery bank. Back up time shall be 30 minutes.

A 12/24 V DC power supply shall be used wherever applicable for the control system and shall be derived from the UPS. Any other voltage level required for the system shall also be the responsibility of the bidder, along with all required hardware.

The DC voltage system for the Main CPU, all I/O stations, and ASI panels shall be of dual-channel configuration and kept separate for different step-down requirements as per system design.

Each field I/O station shall have a separate voltage step-down / standard power converter module system to convert 220 V AC to dual-channel 12/24 V DC to meet the system requirements.

Control & Instrumentation (C&I) equipment furnished shall incorporate necessary techniques for protection against electrostatic discharge (ESD) and radio frequency interference (RFI), in accordance with applicable international codes and standards.

Safety earthing and C&I system earthing shall be kept separate. The safety earth bus shall be connected to the main plant earth pit. Separate earth pit(s) shall be provided for the system earth bus (electronic earth). The electronic earth shall be directly connected to the corresponding earth bar. The earthing system for automation/C&I shall be of copper only.

A Power Distribution Cabinet (PDC) shall be provided for extension of power supply to field instruments.

Instrumentation:

1. General:

◆ 1. Environmental Protection

- All field instruments shall be suitable for the installation area.
- Instruments shall be:
 - Weatherproof
 - Dust-tight
 - Corrosion-resistant
 - Minimum protection class: **IP66**

Installation & Mounting

- Instruments shall be properly mounted, supported, and terminated either:
 - In local stainless steel (SS) junction boxes, or
 - Directly to Remote I/O (RIO) systems
- Instruments shall be installed to ensure:
 - Easy access for maintenance, removal, lay-down, and calibration
- Instruments with local/remote indication (critical parameters) shall be positioned for clear visibility of readings
- OEM installation recommendations shall be strictly followed for both field and control room instruments

3. Access & Maintenance Facilities

- Provide portable self-supported SS access ladders with platforms for safe access to:
 - Instruments
 - Valves
 - Actuators

4. Accuracy Requirements (Minimum)

- Temperature & Pressure Transmitters: **±0.2% of Full Scale Deflection (FSD)**
- Pressure & Temperature Gauges: **±0.5% of FSD**
- Conductivity Transmitters: **±1.0% of FSD**
- Level Measurement Devices: **±5 mm accuracy**

5. Design & Selection Criteria

- Measurement ranges shall be selected to ensure:
 - Best accuracy
 - Adequate resolution within operating range
- Thermowell material: **SS316**, suitable for process conditions
- Minimum dial size for pressure & temperature gauges: **150 mm**
 - Smaller sizes require purchaser approval

6. Materials of Construction (MOC)

- Wetted parts / sensing elements in contact with process fluid:
 - Must be **SS316**
- Instrument air piping:
 - SS-304 piping with SS-304 distributor
 - Must include FRL / moisture trap arrangement
- All instruments must comply with hygienic design requirements:
 - **EHEDG / 3A certified (dairy-grade hygienic standards)**

7. Instrument Air & Cable Protection

- Instrument air and cable entries must have proper protection
- Outdoor electronic instruments shall include:
 - Protective canopy against sun and rain

8. Tagging & Identification

- All instruments/equipment shall have SS tag plates with:
 - Engraved tag number
 - Service description
- Tags shall be fixed using SS chain

9. Isolation & Maintenance Features

- Inline measuring instruments shall be provided with:
 - Block & bleed valves
- This allows removal without process shutdown

10. Calibration & Documentation

- Calibration of all measuring instruments is mandatory:
 - Certificates required before commissioning and until handover
- Test certificates and material certificates (MOC) must be provided for all instruments

11. Spare Philosophy

- Minimum spares: **10% of total supplied quantity or as specified (whichever is higher)**

- Excludes commissioning and installed spares

Specific spares:

1. For temperature, pressure, level, flow switches/transmitters:
 - 10% sensors/switches/transmitters
2. For flowmeters, level transmitters, turbidity, conductivity:
 - 10% of:
 - Power supply cards
 - Signal amplifier cards
 - Display cards
 - At least 1 spare per size / type of instrument must be provided

12. Earthing Practice

- Instrument cable shields shall be grounded at **one end only**

2. Temperature & Pressure Transmitters (Temp.& Pressure) :1 Lot

This reads like a specification for industrial instrumentation (likely from a tender document). Here's a clearer, structured interpretation of what it is requiring:

The process and utility transmitters must be selected based on the best available market standards in terms of accuracy and reliability. All analog signals (4–20 mA) from field instruments must be hardwired and interfaced with the automation system through I/O stations. The transmitters should support field diagnostics and configuration capabilities.

For installation, all sensors used in tanks and pipelines must have proper sanitary mounting arrangements suitable for dairy applications, with the required IP protection rating. In pipelines, tri-clamp sanitary connections are specifically required. Each transmitter should also have a separate local digital indicator wherever needed.

All critical process parameters must have both local or remote displays, with the remote display mounted at an appropriate operating height for easy visibility.

Temp transmitter shall be blind type.

The process transmitters must have an accuracy of at least $\pm 0.2\%$ of full-scale deflection (FSD) or better.

All wetted parts, including sensing elements and internal components, must be made of AISI 316 stainless steel. For applications involving corrosive or storage fluids, diaphragm seal type transmitters with capillary systems are required.

The bidder is responsible for determining and declaring the exact number of transmitters required based on the tender scope and functional requirements, and must include them in the offer.

For product line applications, pressure transmitters must be of diaphragm type.

3. Process gauges : 1Lot

Process gauges shall be provided for local indication on all utility lines, process lines, and process tanks (as necessary).

Pressure Gauges:

- Pressure gauge sensing elements shall be of Bourdon, Bellow, or Diaphragm type in general, depending on process conditions.
- Direct-reading pressure/differential pressure gauges shall use SS316 sensing elements and AISI 304 movement material.
- Pressure gauges installed on product lines shall be of diaphragm type.

Temperature Gauges:

- Local temperature measurement shall be done through bi-metal temperature gauges.
- Temperature gauges may be direct-mounted type (multi-angle) or provided with SS capillary extension (minimum 2 meters), depending on application requirements.
- The sensing element, bulb, capillary, etc., shall be of SS316 for temperature gauges.

General Requirement:

- The bidder shall quantify the number of gauges required based on the tender and functional requirements and submit a comprehensive commercial offer.

3. Temperature Elements :1 Lot

All temperature sensing elements shall be of duplex type with SS 316 sheath, suitable for sanitary applications and the required IP protection class. Depending on the temperature range, Pt-100 Resistance Temperature Detectors (RTDs) shall be used.

RTD heads shall be of waterproof construction, provided with a chain holder, duplex terminal block, gasketed cover, and stainless steel chain.

Suitable sanitary-type mounting arrangements shall be provided for installation of sensors in various tanks and pipelines, specifically designed for dairy applications. Tri-clamp type sanitary mounting shall be provided for sensors installed in pipelines.

The bidder shall quantify the number of such elements required based on the tender documents as well as functional requirements and shall include the same in their offer accordingly.

4. Process Switches: 1 Lot

High-quality hygienic industrial switches (pressure, temperature, level, etc.) integrated with PLC I/O systems, suitable for dairy/CIP processes, with adjustable setpoints and differential, and properly sized by the vendor.

5. Control valves : 1Lot

Control valves having minimum leakage class IV with adequate turn down for process & utility application shall be provided having best reliability & accuracy, as available in the market and the hard wired signals (4-20mA) with field configuration facility. The I-P converters (With required IP class for dairy application) shall be connected with an automation system through field I/O stations. For steam applications, control valves shall have an extended bonnet. The bidder shall quantify the number of such control valves required based on the tender requirements as well as functional requirements and shall offer accordingly. The valves shall be of sanitary type for process applications.

Control valves for utility lines (steam and chilled water) shall have flanged-type process connections. Actuated ON/OFF valves are to be provided before each control valve.

A solenoid valve shall be provided in the compressed air line to the control valve to ensure complete (100%) shut-off during non-operation of the valve.

6. Magnetic flow meter: 1 Lot

Milk transfers within the Liquid Milk Plant shall be carried out using magnetic type flow meters. Raw milk and soft water flow meters shall also be of magnetic type.

The flow tube material shall be SS 304 with PTFE/PFA lining. The electrode material shall be SS 316L, depending on process conditions. In general, SMS-type process connections may be used for magnetic flow meters.

The flow sensors shall be of sanitary type and suitable for dairy applications, with the required IP protection class.

The accuracy of a magnetic flowmeter shall be $\pm 0.5\%$ of the measured flow rate or better

low Measurement & Display Requirements

1. Local Display

- A **digital local display** shall be provided.
- The display shall show:
 - **Instantaneous flow rate**
 - **Totalized flow**

2. Flow Transmitters / Field Devices

- Flow transmitters shall support the **required turndown ratio** as per process conditions.
- Each transmitter shall be provided with a **separate field-mounted digital display unit**.
- The display unit shall:
 - Receive **4–20 mA hardwired signal**
 - Include **field diagnostics capability**
 - Allow **configuration at site (field configuration facility)**

3. System Integration

- Communication with the **automation/control system** shall be implemented via **remote I/O stations** (no direct hardwiring to PLC/DCS preferred except through RIO).

4. Magnetic Flow Meter Scope

- The bidder shall be responsible for **sizing and quantifying the number of Magnetic Flow Meters**.
- Quantity shall be derived based on:
 - Tender drawings / P&IDs
 - Functional requirements
 - Process design conditions
- The bidder shall ensure the offered quantity is **complete and adequate for intended operation**.

7. Mass FlowMeter :1Lot

The flow sensors shall be sanitary-grade, suitable for dairy applications, and shall have an appropriate IP rating as required for the installation environment

The mass flow meter envisaged shall be of the Coriolis curved-tube type. The mass flow meter shall be capable of measuring:

- Mass flow rate
 - Density
 - Temperature
 - Volumetric flow rate
 - Totalized (cumulative) flow
-
- The flow tube and all wetted parts shall be made of SS316 or SS316L, or of a material suitable for the process fluid as per compatibility requirements. SMS-type process connections may be used for the mass flow meters. The accuracy of the mass flow meter shall be $\pm 0.2\%$ of the measured flow rate or better. Transmitter shall be provided with separate field mounted digital display unit.

The bidder is responsible for determining the quantity of mass flow meters required in accordance with the tender specifications and functional requirements, submit a comprehensive commercial offer.

8. Vortex flow meters: 1 Lot

Flow meters for Steam & compressed air & RO water shall be vortex type with to totalizer shall be a two-wire device with the required IP protection class. The device shall operate on the vortex shedding principle and be suitable for utility applications. The flow meter for steam and air service shall have in-built temperature and pressure sensors for density compensation. The flow meters shall have a turndown ratio of 12.5:1 or better.

The flow transmitters must have a required turndown capability, and they should be equipped with a separate field-mounted digital display unit. This display unit must be connected using a hardwired 4–20 mA signal and should support field diagnostics and configuration functions.

Additionally, the connection between the field instruments and the main automation/control system should not be direct. Instead, it should be routed through remote I/O stations.

The bidder shall quantify the number of VFMs required based on the tender and functional requirements and submit the offer accordingly

Digital display of flow rate as well as totalizer shall be provided. The wetted parts material shall be SS316/SS316L or as per the requirements of the process fluid. Transmitter shall be provided with separate field mounted digital display unit.

Accuracy of vortex flow meters should be $\pm 1.0\%$ of measured flow rate or better,

The bidder is required to assess and determine the number of VFMs based on the tender documents and functional requirements, and shall accordingly submit a comprehensive commercial offer

9. Level Transmitters : 1 Lot

Flange-mounted diaphragm seal type level transmitters (or better sensor type) with sanitary design shall be used for level measurement in tanks requiring high accuracy, reliability, and appropriate turndown ratio. These instruments must be suitable for dairy applications and shall have the required IP protection class as available in the market.

For concentrated chemical storage tanks, ultrasonic level transmitters shall be provided instead.

All wetted parts shall be made of SS316 stainless steel or other suitable corrosion-resistant material compatible with the process fluid.

The level transmitter design shall ensure that the sensing element and electronic unit are either:

- physically separated, **or**
- provided with a remote seal arrangement to prevent moisture condensation affecting electronics.

Each level transmitter shall include a separate field-mounted digital display unit with:

- 4–20 mA hardwired output signal
- field configuration capability
- diagnostic functionality

Communication with the plant automation system shall be via remote I/O stations.

The wetted parts material shall be SS316/SS316L or as per the requirement of process fluid. The accuracy of LT (Level Transmitter) should be $\pm 0.2\%$ of the measured value or better.

The bidder is required to assess and determine the number of LTs based on the tender documents and functional requirements, and shall accordingly submit a comprehensive commercial offer.

10. Conductivity Transmitter : 1 Lot

Conductivity transmitters with the required turndown capability shall be used for measuring the concentration of CIP (Clean-in-Place) chemicals. For rinse milk solid (TDS) measurement, conductivity-based instruments with the best available accuracy and reliability suitable for dairy applications shall be provided, including the appropriate IP protection class as per environmental conditions.

SMS-type process connections may be used for the conductivity transmitters.

The conductivity transmitters shall be supplied with a separate field-mounted digital display unit and shall provide hardwired 4–20 mA output signals. The system shall include field diagnostic and configuration capabilities.

Integration with the automation system shall be implemented via remote I/O stations.

Accuracy of CT should be $\pm 1.0\%$ of measured value or better.

The bidder to quantify the number of CTs required, based on the tender as well as functional requirements & submit a comprehensive commercial offer.

11. Variable Frequency Drives : 1 Lot

The Variable Frequency Drives (VFDs) shall be of smart type, having fieldbus connectivity with required diagnostic features. The VFDs should be designed for seamless integration with industrial automation systems and shall support standard communication protocols such as Modbus, Profibus, Profinet, or Ethernet/IP as applicable.

The requirement states that the VFDs should be configurable both from the Human Machine Interface (HMI) and from the field (i.e., locally at site). They must be of high accuracy and reliability, matching or

exceeding the best available in the market.

The bidder is responsible for assessing and declaring the exact number of VFDs needed based on the tender scope and functional requirements, and must include them in their offer accordingly.

Each VFD should include a built-in DC choke (acting as an internal harmonic filter). In addition, if required by system design, external AC line filters must also be provided to control harmonics and power quality issues.

For installations in electrically sensitive areas, Radio Frequency Interference (RFI) filters must be included to prevent electromagnetic interference with nearby electronic equipment.

5. MAJOR RESPONSIBILITIES OF BIDDER & OMFED/CLIENT:

4.1 Responsibilities of Bidder:

- It is not the intent of these technical specifications to specify completely all details of design and fabrication of any plant or equipment. Nevertheless, the equipment shall conform in all respects to high standards of engineering design and workmanship and be capable of performing continuous commercial operation up to the supplier's guarantee, in a manner acceptable to the purchaser or project authority.
- The purchaser/project authority will interpret the meaning of various equipment specifications and drawings and shall have the power to reject any material/equipment which, in their opinion, is not in full accordance with the bid specifications.
- The supplier shall be responsible for undertaking all work involved in implementing the project within their battery limits. This includes the design, supply, installation, and commissioning of the entire project components, comprising:
 - Process equipment
 - Process pipework
 - Utilities equipment
 - Service pipework
 - Electrical equipment
 - Power cabling
 - Instruments and controls
 - Control cabling

The scope also includes all necessary supports, support structures, cable ducts, trucking, conduits, etc., required to complete the installation in accordance with the Project Authority's high standards.

No exclusions of any nature shall be acceptable, other than those specifically detailed in this document as being supplied by the Project Authority or included in the scope of other Bid/PO packages

- Supplier to supply numerous miscellaneous items such as tables, supports, support structures, staircases and platforms, crossover stairs, lifting equipment, nameplates, safety guards, danger notices, rubber mats, safety devices, testing instruments, etc.

In particular the Bidder/Supplier shall be responsible for:

- The agency shall be responsible for developing the process design and engineering design and ensuring optimal performance of individual equipment as well as the overall process plant. The Bidder shall engage reputed specialists in their respective fields wherever required.

The agency shall provide the Project Authority with all necessary technical data, technical literature, and design calculations, including production and service load calculations.

The scope shall also include the development of automation schemes, software, interfaces, and their integration into the project to the complete satisfaction of the Purchaser/Client.

- Execution of the project shall be carried out in accordance with the prevailing Indian Standards, Indian Boiler Regulations, Indian Electricity Rules, Indian Explosives Act, Indian Factories Act, Indian Pollution Control Acts, and any other Acts relevant to the project. Wherever Indian Standards are not available, the supplier shall follow applicable International Standards.
- Adequate protection of equipment stored in open within the dairy premises” refers to the measures taken to ensure that machinery, tools, and processing equipment kept in open areas of a dairy plant are protected from contamination, damage, and deterioration.
- Ensuring satisfactory performance and after-sales service of all items included in the scope.
- Arranging approvals from various statutory authorities on behalf of the Project Authority. The statutory fees shall be reimbursed by the Project Authority upon production of receipts. Ensuring satisfactory performance and after-sales service of “bought-out” items is included in the scope of supply. The first charge of oil, lubricants, and consumables shall also be included. “First charge” means that these items shall be replenished until the successful completion of product trials.
- Test equipment, test kits, instrumentation, and materials required to establish performance parameters shall be provided. Supply of fire-fighting equipment (fire extinguishers) at all strategic points as per statutory requirements for the building

areas within the Bid Package.

- Necessary manpower, construction equipment, and tools required to undertake all work included in the Bid Package, including testing, commissioning, and operation of the plant during production trials, shall be provided to the satisfaction of the Project Authority.
- All these measures together form part of a **safe, reliable, and well-maintained industrial/workshop environment**, ensuring:
 - Safety of workers
 - Protection of assets
 - Smooth production without interruptions

.Performance guarantees shall be required with regard to the following::

- Timely completion of work or project milestones
 - Quality standards of goods or services delivered
 - Minimum uptime or availability (for systems/services)
 - Compliance with technical specifications
 - Service level requirements (response time, resolution time, etc.)
 - Warranty obligations and defect correction timelines
 - Penalties or remedies **in case of non-performance**.
- **Training of Project authority's personnel in plant operation and control, maintenance and repair of systems and equipment.**

4.2 Responsibilities of Client/OMFED:

- Space for temporary store and office at site.
- Details of civil design, building layout and drainage and sewage disposal.
- Documentation of local conditions related to climate, access and communications.
- Adequate staff including operators, supervisors and engineers for trial, testing commissioning and product trials.
- Temporary water and power supply at one mutually agreed point within the dairy premises on chargeable basis.
- Permanent water and power supply at the time of commissioning of the plant.

- All buildings including roads, drainage and minor civil works after and during plant and pipe work installation. However, covers over trenches, if any, shall be provided by the supplier(s).
- Provision of and cost of services, raw product, packaging material and chemicals (if available in the country). Lighting and domestic wiring distribution system.
- Engineering personnel to liaise with the supplier, Project Manager and the execution team.
- Lightning protection system of building.

5. GENERAL GUIDELINES:

5.1. General Specification:

The manual shall cover the following aspects:

- Brief Process Description & Flow sheet.
- Unit-wise function and description.
- Equipment-wise details, operational instructions, maintenance procedures and schedules.
- Plant start-up, commissioning, normal operation, and emergency operation.
- Trouble-shooting.
- As built drawings of the equipment as built drawing connection diagrams.
- Spares inventory and services of supply.

The manuals and drawings are to be supplied as follows:

- 4 sets of manuals and drawings in hard copy.
- 3 sets of above in soft copy in CDs.

Following documents in the list for the manuals should be added to the mentioned list:

1. 3D Model of complete plan including piping to save time in installation and future expansion is must.
2. Isometric drawings for process and utility piping.

3. Plan layout with sections ,Floor wise plant layout , GA drawing
4. As built P&IDs with complete equipment list with specifications.

5.2.Automation:

The automation system shall be dispatched to site only after testing by simulation.

5.4.7. TRAINING

The training hall shall form an important component of Project Management and shall be established and operated by the supplier. The supplier shall train all levels of staff of the Project Authority in the operation of the plant and control systems, including managers, engineers, supervisors, operators, and maintenance personnel. Emphasis shall be placed on both theoretical understanding and practical application of system operation and maintenance..

Training shall be provided at site during testing and commissioning of the plant, and a schedule shall be proposed by the supplier along with the content of the training programme(s). The schedule shall be submitted well in advance

Training should commence during the commissioning period and

include 20 man-days of trainers time as follows:

- During erection
- Exposure to the working and construction of the various equipment comprising the various systems of the plant, including instrumentation and controls.
- During commissioning
 - Exposure to and training in the operation and maintenance of various equipment in the plant, including testing and calibration, as well as the setting of instruments, both local and panel-mounted.
 - Familiarization with start-up procedures, management operations, basic principles of controls, control during operation and adjustments, fault finding and including operation and maintenance on control system and maintenance of the plant 30 man-days.

1. Managers and senior personnel training

2. Supervisors and section head training
3. Supervisors operators and maintenance staff
4. Operators and maintenance staff training

5.4.8. Service cover:

The Indian representative of the bidder shall attend the project for 3 days once in three months throughout the one year following product trials and expiry of the guarantee period, with initial service cover.

These visits shall cover meetings, training, equipment adjustment, and servicing. These visits shall not cover guarantee work, which shall be undertaken separately from the service cover.

The objectives of service cover visits are intended to ensure that the efficiency of the plant is maintained at an optimum level and that breakdowns are minimized through regular inspection, maintenance, and timely servicing of equipment

- To help improve operating and maintenance procedures.
- To keep the plant adjusted for optimum energy efficiency, optimum product quality and minimum product losses.
- To arrange for service visits by specialists to inspect service and carry out repairs.
- Spare parts during the service cover shall be supplied by the client.

5.4.9 Standby operation:

After the plant is successfully tested and handed over, the contractor must provide “**standby**” **technical experts** for the first year of operation.

1) Site visits by senior commissioning team

Senior members of the commissioning team must come to the site **twice** in the first year:

- **First visit (mission 1):**
 - Starts immediately after successful performance trials are completed.
- **Second visit (mission 2):**
 - Starts about **6 months after the first visit ends.**
- Each visit lasts **15 days**.

2) Purpose of standby support

During these visits, the experts must:

- Ensure plant operators are following **correct operating procedures**
- Help operators make **proper running adjustments** to:
 - plant equipment
 - control systems
 - instruments
- Fix operational issues and improve day-to-day performance

3) Training requirement

They must also conduct structured training:

- **2 training sessions per week**
- Each session lasts **4 hours**
- Focus areas:
 - weak operational practices
 - plant management
 - operation
 - maintenance

BATTERY LIMIT

Item	Purchaser's Scope	Supplier's Scope Includes
Civilworks	Civil building & necessary foundations for equipment based on the details provided by the equipment supplier.	Supply of necessary foundation bolts along with the template, subbase, motor slide rails and all other associated materials for erection and alignment of the outside equipment. Civil work pertaining to the earthing, earthing chambers. Rectification of defective work resulting from the incorrect / delayed / in sufficient information provided by the supplier..
Standardized Milk	Milk at the inlet of Existing UHT section milk silo valve battery. (i.e 2X20 KL)	Milk through Existing UHT section valve battery, to blending storage tanks, UHT sterilizer, Aseptic Tank & to aseptic packing section, excess milk return through Aseptic Tank and Filling machine line will be in rinse Product recovery section same shall be transfer to Existing Rinse recovery System in UHT Plant. Processing plant including necessary valves/ electrical etc. with TS recovery & CIP facility. All chilled product transfer lines shall be suitably insulated & Al. clad. The Product pipe line and CIP return line along with necessary valves, fittings, electricals etc. is in scope.
Butter Milk /Flavoured Milk /Lassi	The Required Standardized Pasteurized Milk for Butter milk/Flavoured Milk/Lassi shall made available in 2x20 KL Milk Silo Tank.	The Transfer of Milk from 2X20 KL Milk Storage Tank to Blending Section. Required modification in Silo Valve Cluster, Pumps ,Pipe & Fittings Valves & Electrical & Automation modification in signal Exchange shall be in the Scope.

Sugar Syrup Preparation	Purchasers shall provide Mezzanine floor (Civil) to dump manually dry Crystal sugar to the Sugar syrup Preparation Tank.	Sugar Syrup Preparation Tank on words heating, Filtration cooling and Sugar Syrup Storage and transfer shall be included in the scope of Bidder.
Juice Preparation	Purchaser shall make available the Mango Pulp and Orange juice concentrate in drums after thawing process if its in frozen Condition up to the Pulp unloading Station	From Suction lance to unloading Pulp and Storage. Then transfer to blending Section scope shall be included in the Bidder Scope.
Ingrident Preparation	All ingrident, flavours for Juice Preparation purchaser shall be made available up to Indrident Dosing & Preparation Tank.	Ingrident Preparation, Filtration and dosing shall be included in the Bidder Scope.
Cocoa Slurry and Prectin Preparation	Purchaser Shall made available Cocoa Power and Pectin for Slurry Preparation for Chocolate Milk & Juice in Respective Section for Manually Dumping.	The Mixing Part with High Shear mixer /blender shall be included in the scope of Bidder.
Dry Sugar and Stabilizers	Purchaser shall made available the Dry Sugar Bags and Stabilizer for the Preparation of Flavoured Milk /Chocolate Milk in Bleding Section	The Mixing Part with High Shear mixer /blender shall be included in the scope of Bidder.
CIP lines	Concentrate line for Acid & Lye is available in Existing UHT CIP Station Concentrate Storage Area.	Bidders need to lye separate Acid and Lye Concentrate Pipeline, Pumps & Electrical and Automation, Flowmeter up to the CIP Station of Blending Section As Well As Aspetic Tank CIP Station.
Water lines	Raw and soft & RO water header upto one point near UHT section. Any Capacity Upgradation in Existing RO water Generation Plant as per requirement of Pre-processing and UHT Processing Bidder same shall given by Purchaser.	Distribution of raw and soft & RO water as per requirement in Preprocessing and UHT Processing Section. Raw, soft and RO water lines to be provided for the APS section up to consumption points same shall be included in Bidder Scope.
Compressed air lines	Compressed Air header up to one point inside the UHT Section. If any capacity upgration in Existing Compressed air System same shall be given by Purchaser	Further Distribution of Compressed air up to all the utility points of the of Blending Section, UHT Processing Section & APS section up to consumption points shall be included in Bidder Scope.
Chilled water lines	Chilled water supply and return headers near UHT section.	Chilled water lines supply & Return header to all the utility points of the blending, UHT processing and APS Section (insulated/AI cladde) with necessary isolating valves up to the consumption points shall be included in the Bidder Scope.
Steam & Condensate	HP Steam header near UHT section is available at one point. . Condensate Overhead tank storage Tank available on the roof terrace.	Steam distribution (piston valves envisaged) up to all the utility points of the Blending, UHT Processing and APS section. One Hp steam PRS for UHT Sterilizer as per Process Requirement.

		and One LP PRS steam for Blending Section, Aspetic Tank & APS Section & CIP Station with Isolating valves & Distribution piping for individual section. Condensate recovery (pumping trap based) from all the utility points to a collection up Existing Condensate recovery tank.
Electrical	Outgoing feeders of new substation PCC laying of Power Cables up to IMCC for Preprocessing ,UHT Processing and APS Section	IMCC Distribution of power and controls up to the consumption points. UHT Section IMCC. Distribution of power and controls up to the consumption points Pre Processing, UHT section and APS Section. Necessary earthing of UHT section IMCCs, MCCs & APS section, main machines and downstream equipments are also included in the scope of this bid...
Automation		Integration with LMP plant, described in the design basis for data and signal exchange for carrying out fool-proof and safe transfer/ CIP/ operational activities. Integgration with PLMS system of APS section All required hardware/ software/ licenses/ instrumentation/ cabling trays/ supports / devices/ equipment etc. complete is in the scope of this tender as mentioned in design basis and as required for operational and functional requirement of UHT plant
Structural / Pipe Bridge/ supports & platforms	Existing Service Birdge Available as UHT Building Premises same shall be utilized.	Further Any extension requires for Service Bridge to cater the load of New Pre processing , UHT and APS Section support shall be taken from Building wall as per Existing Support structure. Existing Outdoor structural pipe bridges/supports (wherever required) in GI construction for product, water (raw/soft/RO), steam & condensate return, chilled water, compressed air & power cables. CIP kitchen platforms/cross over bridges inside plant in SS-304 construction. All pipeline supports for milk/product lines/cable trays inside the plant shall be constructed from SS-304 box sections. Spiral staircase and common platform for milk silos in GI construction with SS railing. Misc. structure (SS-304) including pipe cross over, any equipment platform, perforated bird proof enclosure for outdoor milk silos etc. shall be supplied & installed.
FAV system	Existing FAV System shall used .If any Upgradation in system same shall be given by Purchaser.	FAV System scope excluded from Bidder.

6. TECHNICAL DOCUMENTS, DETAILS AND DRAWINGS TO BE FURNISHED

7.1. ALONG WITH THE BID

- Mass Balance: Related to all products.
- P&I drawing including CIP and flow diagrams for process/cleaning.
- Process time schedule:
- Utility consumption and Histogram:
- Equipment layout: Proposed dimensioned layout drawing showing location of equipment in various rooms including MCCs, Local/remote Control Panels. Service piping Schematic for Raw water, soft water, steam, chilled water, compressed air including branch lines, valves, insulation thickness, controls, instruments, traps, sight glasses, strainers, safety valves and all accessories etc., for all the services.
- Electricals The single line diagram for electrical distribution starting from PCC to all MCCs List of spares for Two Years of Normal Operation (Mechanical / Electrical / Instrumentation & Automation)

NOTE:

- 1. All drawings submitted shall be scaled Auto CAD 2014 or later version drawings only.
- 2. It may be noted that drawings, which are to be submitted with the bid, are binding and mandatory for technical evaluation of the bid. Bids without the complete set of required drawings may be treated as incomplete and non responsive.

7.2. AFTER AWARD OF CONTRACT

- DRAWINGS: The following drawings shall be submitted after award of contract for approval before supply/ execution of works or before submission to statutory authorities.
- Equipment layout drawing showing final proposed location of all equipment, MCCs, Remote PB stations, etc., under the scope of contract showing all dimensions/clearances.
- Electricals: Final proposed single line electrical distribution drawing showing final HP rating of all equipment. Also a

cable route layout for cables routed through Cable trays/floor conduit /hume pipe routes/Underground/Pipe bridge (if any) and VI-55 trenches etc. Cable route marker location in drawing if any to be shown. Schematic for interlocking and controls of equipment section wise is also to be submitted. Fabrication and GA drawings of MCC/RCPs including control wiring with ferrules etc. Earthing network drawing giving complete details of earth grid with conductor sizes are also to be submitted.

- Fabrication and GA drawings All drawings of equipment other than the Standard drawings given by purchaser.
- Statutory requirement drawings All necessary drawings for submission to statutory authorities for approval like Boiler Inspectorate for HP/LP lines, Electrical inspectorate for MCCs and for the Electrical installation, Explosive inspector for FO yard layout and tank structural stability etc., and any other such statutory approvals. Drawings have to be prepared by the successful bidder in the required scale, format and style as per requirement of statutory body.
- Foundation and Trench drawings Foundation drawings of the various equipment needing separate foundations like Silos, including static and dynamic load details and other special features if any have to be submitted by the successful bidder. Also trench drawings of conveyors for can conveyor etc. is to be submitted immediately on award of contract. All relevant design calculations for the final proposed pipe sizes, cable sizes, structure sizing etc., are to be furnished by the successful bidder after award of contract.
- Final Handing over Documentation:
- FOUR (4) sets of the following after final completion of plant erection and commissioning:
 - a) As executed drawings of all electrical and mechanical drawings. All drawings shall be on AutoCAD and softcopy submitted along with the hard copies.
 - b) Operation and maintenance manuals section wise/equipment wise including catalogues/literature/technical details of individual of bought out equipment.
- Documents of all statutory approvals.

8.7 SS PIPES (MILK/PRODUCT/CIP), FITTINGS & VALVES:

1.0 Type: TIG welded, annealed and de-scaled tubes shall be manufactured as per the standard ASTM-A270. Outer surface of the

tubes should be mat finished and inner surface should be acid pickled & finished as per dairy standard.

2.0 Material of construction and thickness: 2.1 All the pipes unless otherwise stated shall confirms to AISI 304. The average wall thickness of tubes should be 1.6 mm up to 76.2 mm diameter and 2.0 mm for diameters 101.6 and above. The wall thickness VI-68 at any point shall not vary more than 12.5% over and under from the average wall thickness specified. The ovality on the open ends shall be within the permissible limit specified in the ASTM A270.

2.2 Supports shall have wall thickness of 2.6 mm up to 40 mm dia pipe and 3.2 mm for higher size pipes up to 63 mm dia.

Testing: All the process tubes shall be hydraulically tested at the manufacturer's works at 1500 PSI for pipes up to 38.1 mm diameter and 1000 PSI for tubes size 50.8 and above. All the tubes shall bear the heat mark. The supplier is required to furnish the test certificate of the tubes with respect to chemical composition, tensile test and mechanical test.

VALVES: 1.0 Sanitary pneumatic seat valves Type: Two way / three way pneumatically operated sanitary valves of mix-proof (self-cleaning), ON-OFF seat valves, flow diversion valves, butterfly valves etc. shall be provided with ASI connectivity. All the valve battery valves shall be of self-cleaning type mix proof valves having 3 solenoid (each).

Material : AISI 316

Sealing :Positive

Controls : Electrically/electronically operated

The Pneumatic valves shall have the following features to cater to fulfill the above functional requirements:

Housing shall be ball shaped for the ideal flow characteristics to ensure 100% cleanability by CIP. Housing closed by cover plates should not create a sump or dead corners. Housing interconnections shall be by detachable type clamp connection. The seals such as housing seals, stem seals and disc seals shall be flush mounted.

Digital valve positioners shall be suitable for two way digital

communication based on field run bus technology (ASI), this shall ensure real time notification of current and potential valve and instrument problems.

Valves shall have low/very low susceptibility for the pressure surge. The valve shall have the short leakage outlet to recognize the leakage immediately.

Valve shall have open lantern installed between the actuator and the product area of the valve to assure that leakages occurring at the stem seal shall be immediately visible and also shall act as a protection against overheating of the actuator.

Mix proof valves shall be used wherever the CIP and the process liquids are inter-crossing in the piping system. The CIP of the isolation area is possible and also the leakage shall be easily identified. VI-69

The Bidder to quantify the number of transmitters required, based on the tender as well as functional requirement & offer accordingly.

All pneumatic connections from the header up to individual valves shall be of SS-304 through suitable SS-304 distribution headers connected with FRL units/moisture separator etc. 500 mm pneumatic flexible tubing to be considered at control unit side for all valves. The valves should have required diagnostic features, to be monitored from HMI & recorded in the system. The valves should also be configurable from the HMI/operator console.

All lateral headers of valve batteries of milk & milk products shall have independent water flushing & CIP facility.

8.7.1 SS PIPING (MILK/PRODUCT/CIP) AND SS-304 SUPPORT

Quantity: 1 Lot for Reception, Processing, Transfer CIP etc.

For pipelines sizing following velocities of the fluid shall be considered.

Milk (Suction/ discharge): < 1.5 m/s / 2 m/s

Cream (Suction / discharge): 1 m/s / 1.5 m/s

Other details as per general description given in basis of design. All process milk/product & CIP pipe supports inside the plant/corridor shall be of SS-304 box section.

Pipe supports outside the plant shall be of GI.

8.7.2 SS PNEUMATIC VALVES

(ALL TYPES OTHER THAN MIX PROOF TYPE)

Quantity: 1 Lot for Reception, Processing, Transfers & CIP etc.

In addition to milk, cream & CIP lines, SS pneumatic valves shall also be provided for water & air connections (after tapping from main header) to process application.

As per general description given in basis of design.

All pneumatic valves must have ON/OFF & fault feedback facility.

8.7.3 SS PNEUMATIC MIX PROOF VALVES (SELF-CLEANING)

Quantity: 1 Lot for Reception, Processing, Transfer, CIP etc.

Duty: For all valve battery application in Raw & Past Milk silos, Cream storage tanks & Recon. milk preparation tank etc.

As per general description given in basis of design.

All mix proof valves shall have 3 solenoids.

8.7.4 SS FITTINGS & MANUAL VALVES

Quantity: 1 Lot for Reception, Processing, Transfers & CIP etc. Plug

Valves: The plug valve shall be in 2 way or 3 way configuration with SMS end connection as specified. The valve body and plug shall be made out of investment casting using AISI 304 material. The inner side of the valve body and the contact surface of the plug shall be ground smooth and then lapped to get full metal-to-metal contact. The outer visible surface of the valve body and the plug shall be as per dairy standards. The nozzle port shall be provided with SMS union complete with nut, liner, male part and neoprene food grade rubber gasket. The male part shall be integral part of the valve body casting. The manufacturer is required to test each valve on a hydraulic pressure of 7.5 Kg/ Sq cm.

1.0 Manual Butterfly Valve: The butterfly valve shall be of sanitary design and all liquid contacting parts shall conform to AISI 316. The valve sealing gasket shall be Nitrile rubber material suitable for hot water sterilization temperature of 100 deg. Celsius and hot acid and lye solution of 2% concentration at 85 deg. Celsius. The valve shall be provided with SS handle.

The valve shall be with sms union on one side and weld on another side which shall be suitable for direct welding on the pipes.

2.0 Non-return Valve: The non-return valve shall be of sanitary design and all liquid contacting parts shall conform to AISI 304. The valve sealing gasket shall be Nitrile rubber material suitable for hot water sterilization temperature of 100 deg. Celsius and hot acid and lye solution of 2% concentration at 85 deg. Celsius.

The non-return valve shall be with plain ends shall be suitable for direct welding on the pipes.

3.0 Unions: All the parts unless otherwise specified shall be made out of investment casting using AISI 304 material The union shall be complete with liner, male part, nut and sealing ring (neoprene food grade rubber gasket). The liner and male parts should be suitable for expansion joints.

All the inside as well as outside surface of the union shall be as per dairy standards.

4.0 In-line Sight Glass: The in-line sight glass should be complete with SMS unions at both ends having toughened heat resistant glass and protective stainless steel cover. It should have quick replacing arrangement for replacement of glass by flange and bolts. The material of construction shall be AISI 304 unless otherwise specified.

All the inside as well as outside metal surfaces shall be as per dairy standards.

5.0 Crushproof Hose Pipe for tanker unloading & loading: Not required.

6.0 Bend, Tee, Elbow: These fittings shall be made out of AISI 304 unless otherwise specified, process tube, TIG welded, annealed, de scaled having outer surface as per dairy standards and inside pickled, manufactured as per ASTM A270. The thickness of the fittings made from the tube section should not be less than 1.6 mm up to 76.2 mm dia and should not be less than 2.0 mm for above 101.6 mm dia. The wall thickness at any point shall not vary more than 12.5% over and under from the average wall thickness specified. Bends and elbows shall be free from wrinkles. Tee shall have uniform flaring on the branch connection. The ovality on the open ends shall be within the permissible **limit** specified in the ASTM A270. 7.0 Pipe Clamp: Shall be quick open able type of sturdy design.

Other **details** as per general description given in basis of design.

8.8 UTILITY PIPES, VALVES, FITTINGS & ACCESSORIES:

1.0 The main supply pipe sizes of various utilities shall be designed keeping in view the future modifications.

2.0 MATERIALS FOR PIPING:

2.1 Raw, soft & chilled water distribution lines : Galvanized steel

(ERW) IS 1239,3589, 3601,4736 (medium duty)

2.2 For LP steam and compressed air lines: MS 'C' class pipes (ERW) IS 1239/3601/4736. Compressed air lines shall be of GI.

2.3 High pressure steam lines, valves, PRSs & accessories shall be as per IBR.

3.0 Valves

LP steam:

15 mm to 40 mm: CS body, 13% Cr trim 800#, Lift Check valve with SW ends (NRV)

CS body, SS ball, special PTFE seats, 800# with SW ends ball valve

50mm to 300mm: CS body, 13% Cr trim 150#, Globe valve with flanged ends

Pressure < 3.5Kg/ Sq.cm

Water / Air

15 mm to 40 mm: CS body, SS ball, PTFE seats, 800# with SW or SCD ends ball valve

50mm to 300mm : CI body 13% Cr disc, 125# wafer type butterfly

NRV (all sizes): CS body 13% Cr trim, wafer type check

Pressure < 3.5Kg/ Sq.cm

Chilled water

15mm to 40mm : CS body, SS ball, PTFE seats, 800# with SW or SCD ends ball valve

50mm to 300mm : Wafer type butterfly type flanged construction.

NRV (all sizes) CS body 13% Cr trim, wafer type check

Pressure < 3.5Kg/ Sq.cm

Flanges/counter flanges shall be as per BS tables:

Table F for HP & LP steam

Table D for water

Table E for air

4.0 For pipeline sizing following velocities of the fluid shall be considered

4.1 LP steam : 20 m/s

4.2 Water Air : 3 m/s

4.3 : H.P. Steam : 20 m/s

4.4 : H.P. Steam : 25 m/s

4.5 Condensate: As per supplier's design

Note: The payment shall be paid ON LOT BASIS for all pipes and valves. The cost of accessories like flanges, counter flanges, bolts, nuts, bends, tees, gaskets, pipe clamps, PUF saddle for CW lines, structural supports, anchor fasteners for fixing pipe supports, associated civil works, if any, etc. are to be included in the cost of piping. The Bidders have to work out the total quantity for each of the services based on the service pipe layout and the respective service schematic & quote their rates accordingly.

8.8.1 WATER (RAW/SOFT/RO) DISTRIBUTION PIPES & SUPPORT

Quantity : 1 Lot

As per general description given in basis of design. Raw & soft water pipeline shall be of GI and RO water from SS 316. All water pipe supports inside the plant/ corridor shall be of SS-304 box section. Pipe supports outside the plant shall be of Galvanized MS section.

8.8.2 HP & LP STEAM DISTRIBUTION PIPES & SUPPORT

Quantity: 1 Lot

As per general description given in basis of design. All steam pipe supports inside the plant/corridor shall be of SS-304 box section. Pipe supports outside the plant shall be of Galvanized MS section. All steam and condensate piping shall be suitable insulated and Aluminium sheet cladded. The MOC of condensate return line should be MS C class.

8.8.3 STEAM PRS WITH SUPPORT

Quantity: 1Sets

As per general description given in basis of design, steam PRS at the suitable location in the plant building are to be provided. Supports shall be of GI.

8.8.4 CONDENSATE RECOVERY / TRANSFER SYSTEM WITH PIPES & SUPPORT INCLUDING COND. COLLECTION TANK.

Quantity: 1 Lot inclusive of 1 Nos. steam powered pump

As per general description given in basis of design. All condensate pipe supports inside the plant/corridor shall be of SS-304 box section. Pipe supports outside the plant shall be of GI.

8.8.5 CHILLED WATER DISTRIBUTION PIPING & SUPPORT

Quantity: 1 Lot

As per general description given in basis of design. All chilled water pipe supports inside the plant/corridor shall be of SS-304 box section. Pipe supports outside the plant shall be of GI section. All chilled water piping shall be provided with PUF insulation and Aluminium cladding.

8.8.6 COMPRESSED AIR DISTRIBUTION PIPING & SUPPORT

Quantity: 1 Lot

GI 'C' Class with SS-304 drops As per general description given in basis of design. All compressed air pipe supports inside the plant/corridor shall be of SS-304 box section. Pipe supports outside the plant shall be of GI section. Filter regulator & moisture separator units to be provided for distribution as per requirement.

8.9 ELECTRICALS:

8.9.1 INTELLIGENT MOTOR CONTROL CENTRE (IMCC) -Pack-1

Quantity : 1 Set IMCC for UHT section APS consumption points (Processing, CIP, ~~Air compressor, RO water plant, FAV,~~ Outgoing feeder for APS section etc.)

1.0 FUNCTIONAL REQUIREMENTS:

To receive, control and distribute electrical power at 440 V, 50 Hz, AC

in sheet steel housing and communicate real time operating parameters VI-74 to Main PLC Panel. The specifications describe the requirements for the low voltage intelligent motor control centre (IMCC) which shall fundamentally provide for the following:
Achieve controls through microprocessor based systems
Replace hardwiring by using network technology
Provide enhanced degree of diagnostic and protective functions.

The IMCC shall provide comprehensive protection on motors by integrating intelligent motor protection relays (IMPR) or intelligent protection devices (IPD) inside the switchboard. The IMCC should also bundle the bus communication with the most common protocols found in the industrial networks (Modbus SL/Modbus TCP/Profibus DP/Device Net). IMCC / MCC room temperature to be maintained through chilled water based units: 22° C

2.0 Design Requirement and Scope of Supply:

2.1 Statutory Requirements:

IMCC is to be manufactured/assembled as per the latest applicable Indian Standards, Indian Electricity Rules, Indian Electricity Act, Fire Insurance Regulations and comply with all currently applicable statutory requirements of concerned State Electricity Inspectorate and safety codes in the locality where the equipment will be installed and as per the detailed specifications mentioned below.

The manufacturer of the panel must possess a Type Test Certificate from CPRI.

The IMCC should have major switchgears of reputed manufacturers which owns the complete range of the major switchboard components and intelligent devices used in the IMCC. The IMCC should provide the flexibility to choose different solutions in motor protection and monitoring functions according to the requirements of critical motors and non-critical motors and relevant loads.

The switchboard manufacturer could be the original designer of IMCC with a formal approval from the CPRI. All switchgear used in the switchboard shall be of the same manufacturer to allow better inter operability & installation. Local panel manufacturer can be considered only if they possess Type Test Certificate from CPRI. However, panel body shall be of Rittal or equivalent.

2.2 Housing Details:

2.2.1 The switchboard shall be fabricated using pressed and shaped cold rolled steel sections structure of adequate thickness. The sheet steel used for panel shall be minimum 14 SWG sheet except that the partition plates, inter-panel barriers and cubical doors may be made of 16 SWG. The switchboard shall consist of free standing front and back open able panels arranged to form a continuous line-up of wardrobe type cubicles of uniform height. Cold rolled sheets shall be used for doors and front covers. Front doors shall be hinged type with

quarter turn fasteners and bus bars and cable alleys covers shall be bolted type. Each wardrobe type cubicle shall house 8 to 9 feeders or as per design requirement of shipping lengths.

2.2.2 Switch Board shall be extensible at both the ends by addition of vertical sections. Ends of the bus bars shall be suitably drilled for this purpose. Panels at extreme ends shall have openings, which shall be covered with plates screwed to the panel. The switchboard shall be provided with integral base frame. The cable gland plate shall be 2.5 mm thick.

2.2.3 The switchboard shall be totally enclosed, dust, weather and vermin proof and shall conform to degree of protection not less than IP 42 as per IS 2247. Gaskets of durable material shall be provided all round the perimeter of adjacent panel, panel and base frame, removable covers, doors and other openings.

2.2.4 All hardware shall be corrosion resistant. All joints and connections shall be made by galvanized zinc passivated or cadmium plated high tensile strength steel bolts & nuts. Spring washers shall be provided to secure against loosening.

2.2.5 The switchboard shall be non draw out wardrobe type design except for the individual ACB cubicles used, if any, for incoming, outgoing and bus coupler. Each wardrobe shall contain 8 to 9 feeder components as per design. The IMCC shall be suitable for indoor installation. Suitable cable & bus bar alleys shall be provided if required. All components of the switchboard shall generally be approachable from front. However, IMCC can be in double front execution also if specifically asked for. The maximum and minimum operating handle/push button height of any feeder shall not be more than 1900 mm or less than 300 mm with reference to panel bottom. Supporting arrangement and saddles for dressing of power and control cables shall be provided. Maximum shipping length of MCC shall be as per the IEC design. IMCC shall be extendable both sides. Space heaters with toggle switches, fuses and thermostat shall be provided in each cable alley.

2.2.6 The maximum height of the panel shall generally be restricted to 2300 mm and maximum length of a shipping section shall be 2500 mm. Each shipping section shall be provided with suitable lifting hooks. These hooks when removed shall not leave any opening in the board. The maximum and minimum operating handle/push button height of any feeder shall be approximately 1900 mm and 300 mm respectively with reference to panel base. Supporting arrangement for dressing of power and control cables in cable alleys also shall be provided.

Minimum depth of cubicle for installing ACB shall be 1000 mm.

Minimum width of cable and bus bar alleys shall be 300 mm.

Internal arc features: The switchboard should be designed to minimize the risks of occurrence of internal arc and whenever such an arc occurs it should prevent its effect on operators and material/equipment surrounding the switchboard. The short-circuit withstand capacity of the panel with bus bar and supports shall be

minimum 50 KA/1 sec.

2.2.7 Painting:

All metal surfaces shall be thoroughly cleaned and degreased to remove all scales, rust, grease and dirt. Fabricated structures shall be pickled and treated to remove any trace of acid. The under-surface shall be prepared by applying a coat of phosphate paint and a coat of yellow zinc chromate primer. The under surface shall be made free from all imperfections before undertaking the final coat.

After preparation of the under surfaces, the panel shall be spray painted with final two coats of approved shade of powder coating (RAL 7032 Siemens grey). Thickness of powder coating shall not be less than 60 microns.

The finished panels shall be dried in stoving ovens in dust free atmosphere. Panel finish shall be free from imperfections like pin holes, orange peels, run-off paint, etc. All unpainted steel parts shall be cadmium plated or suitably treated to prevent rust, corrosion, etc.

2.2.8 Nameplates: Apart from panel nameplate highlighting the operating voltage, the nameplates for all incoming & outgoing feeders shall be provided on doors of each compartment. Nameplates shall be fixed by screws only and not by adhesives. Engraved nameplates shall preferably be of 3 ply (Black-White-Black) acrylic sheets or anodized aluminium. Special danger plates shall be provided as per requirement. Lettering size shall be 5mm or 15 mm as directed.

Inside the panels, stickers should be provided for all components giving identification no. as per detailed wiring diagram.

2.2.9 Cooling Fan & filter assembly, lighting of panels, heater:

Each section of the panel shall be provided with a set of cooling fan, filter assembly and 2' long T5 tube light fitting operating through a SP MCB and door limit switch.

Each section of the panel shall also be provided with heating plate and a suitable thermostat. RTD's for monitoring cabinet temperature shall be provided at each section along with local indication & same shall be logged in main control system.

The switchboard manufacturer could be the original designer of IMCC with a formal approval from the CPRI. All switchgear used in the switchboard shall be of the same manufacturer to allow better inter-operability & installation. Local panel manufacturer can be considered only if they possess Type Test Certificate from CPRI. However, panel body shall be of Rittal or equivalent and can be locally fabricated.

2.3 Bus bar Sizing Connection and Supports:

The bus bars shall be made from high purity & high conductivity copper. The bus bars and supports shall be capable of withstanding the rated and short circuit current stated in the single line diagram/feeder details.

Minimum size of power (phase) bus bars shall not be less than 200 Amps rating. Maximum current density permissible for Copper Bus Bars shall be 1.2 Amp./mm². A suitable section aluminium earthing bus bar shall be provided in the panel at bottom throughout the length of the panel. Minimum cross section of Al earth bus shall be 300 sq. mm. Provision shall be made to connect the earthing bus bar to the plant earthing grid at two ends. All doors shall be earthed using flexible copper connections to the fixed frame of the switchboard. The bus bars shall be tinned to protect against oxidation.

The bus bars shall be provided with heat shrinkable PVC insulating sleeves of 1100 V grade. Red, yellow and blue colour shall be used for phase bus bars and black colour shall be used for neutral bus bars. The sleeves should be non-inflammable and self-extinguishing type. All joints in main horizontal bus bars and all tap-off connections from the main horizontal bus bars shall be suitably shrouded. Supports for bus bars shall be made of suitable size non-hygroscopic and non inflammable epoxy compound SMC / DMC blocks and these should be adequate in number so as to avoid any sag in the bus bars.

Minimum clearance between bus bars phase to phase shall be 25 mm and that between phases to neutral / earth shall be 20 mm.

2.4 Power Connection:

For power interconnection within the panel board:

Copper conductor PVC insulated cables of adequate cross section shall be used. However, for current rating above 100 Amps, Copper bus bar strips of adequate rating shall be used. Minimum size of copper conductor to be used shall not be less than 4.0 mm². Cable lugs / sockets of suitable size and type shall be used for all interconnections and cable terminations.

For incoming feeders of the MCC, aluminium conductor cable will be used and hence the panel is to be designed for receiving these and wherever required cable boxes with bus bar extensions for receiving more no. of cables, shall be provided in panel by supplier.

For all outgoing motor feeders, the suitable size terminal blocks shall be provided in cable alleys and wiring up to these from contactors shall be done by panel supplier. These terminal blocks shall be heavy duty type to withstand high starting currents. The cable entry shall be either from top or bottom as specified in feeder details. Removable gland plates of minimum 12 gauge thickness shall be provided on top/ bottom of panel (as required), for cable entries. The cable alleys shall also be totally isolated from switchgears by suitable partition plates.

To prevent accidental contacts, all junctions of interconnecting cables and bus bars also shall be shrouded suitably using coloured PVC insulation tape. Standard colour code of red, yellow and blue for phases and black for Neutral is to be followed for all bus bars/conductors.

Auxiliary wiring and Terminals:

Wiring for all controls, protection, metering, signaling etc. inside the switchboard shall be done with 1100 V gray colour PVC insulated FR copper conductors. Minimum size of these conductors shall not be less than 1.5 mm². However, CT circuit wiring shall be done with 2.5 mm². Control wiring to components fixed on doors shall be flexible type.

The complete panel would be subdivided into different sections by purchaser and each section shall have its own control circuit with MCB and indication. Terminal block (Minimum 3 ways) for control wiring shall be provided for each outgoing Motor feeder in its cubical. 10% spare terminals shall always be available in each terminal block. Control wiring up to these terminal blocks shall be done by supplier.

All conductors should be terminated using compression type cable sockets / lugs at both the ends.

Each control wiring termination shall be identified at both the ends by PVC ferrules. The identification termination numbers should match with those on drawings. Suitable size SP MCB shall be used for tapping power for control circuit wiring.

For all motor starter feeders, provision for control wiring to remote ON/OFF control is to be made. The auxiliary wiring for the same shall be brought up to terminal block in the feeder's cubicle.

2.5 Switchgears:

2.5.1 AirCircuit Breakers (ACBs):

These shall be manually operated, fully draw out type with built-in microprocessor based programmable protection, and suitable for 415 V, 50 Hz supply. Microprocessor based programmable protection unit shall have settings for overload, short circuit, instantaneous and earth fault currents with time delay and LED indicators to show various conditions such as Power ON, Overload, Short-circuit, Instantaneous Earth fault, Percentage load, Self Diagnostic Test etc.

Mechanical spring charging mechanism stored energy type shall be provided with mechanical indicators to show 'Open', 'Closed', 'Service' & 'Test' positions. The circuit breaker shall be provided with mechanically operated emergency tripping device. This device shall be available on the front of the panel.

The control supply shall be 240 V AC. 6 NO + 6 NC auxiliary contacts shall be provided.

The interlocks shall be as under:

It shall not be possible to plug in a closed circuit breaker or to draw out a circuit breaker in closed position. It shall not be possible to operate a circuit breaker unless it is in fully plugged-in, test or fully isolated

position. In test position, the breaker shall be tested without energizing the power circuit. The ACB feeder cubical door cannot be opened when ACB is "ON". However, it shall be possible to defeat this interlock for inspection purpose. Closing and trip coils shall work under the following voltage variation conditions:

Closing coils - 85 % to 110 % of rated voltage

Trip coils -50 % to 130 % of rated voltage

For series tripping, overload, short circuit and under voltage/shunt trip release shall be provided.

Built-in relays for overload, short circuit, instantaneous and earth fault protection shall be provided for incoming feeders' ACB. Suitable port like Ethernet/RS 485 must be available in ACB for transferring/communicating data pertaining to, status indication to main DCS / PLC Panel. Operational parameters (V,A,F,KW,KWH etc) shall be communicated to main PLC panel using intelligent power monitors.

Current rating, short circuit current, protection relays etc. shall be as specified in feeder details.

Note: All feeders having 3 pole MCCB shall be provided with neutral link complete with isolating link. However, the MCCBs for incoming and non-motor outgoing feeders shall be of 4 pole construction, unless stated otherwise.

2.5.3 MotorProtection Circuit Breaker (MPCB):

All motors below 40 HP shall be protected by Motor Protection Circuit Breakers (MPCB) having suitable rating thermal overload relays. These shall be used along with contactors as specified in feeder details.

The MPCB will have motor protection tripping characteristics, current limiting and shall have low let through energy. It shall have bi-metallic overload protection and electromagnetic release for short circuit protection. MPCB shall have inbuilt single phase protection and adjustable overload settings.

In the MPCB, it shall be possible to have accessories like auxiliary contacts, trip alarm contacts, shunt release/under voltage release, as required for motor control and protection. MPCB shall give indication for 'ON'/'OFF' and tripping on fault. The breaking capacity of MPCB shall not be less than 50 KA. MPCB shall have rotary operating mechanism with door interlock and provision to lock it in 'OFF' position with a padlock

2.5.4 Switch Dis-connector fuse units:

The load break switches shall be heavy duty, air break type suitable for continuous maximum rating with manual quick make / break mechanism. These shall have positive isolation with positive indication of contact separation. They shall have high short circuit making and withstanding capacities. Breaking capacity shall correspond to AC 23A utilization category. Mechanical interlock shall be provided to prevent opening of door in switch 'closed' position and prevent closing of switch in door 'open' position. However, it should be possible to defeat this arrangement for testing purpose. Live terminals of the switch shall be shrouded.

2.5.5 Fuses:

These shall be non-deteriorating HRC cartridge link type with operation indicator which will be visible without removing fuses for the service. These shall be complete with moulded phenolic fuse base and cover. The fuse base shall be so located in the modules to permit insertion of fuse pullers and removal of fuse links without any problem. One set of fuse pullers to cover entire range of fuses used in the panel shall also be provided.

2.5.6 Contactors:

The rating of the power contactors shall be as required depending upon the feeder rating indicated in the specifications and as per the feeder details table provided in this specification below. Contactors coils shall be suitable for 240 volts, 50 Hz. unless otherwise specified. All contactors shall be supplied with minimum 2 NO + 2 NC auxiliary contacts. Additional contacts if required for interlocking etc. shall also be provided. Minimum contactor rating for power shall be 9 Amp. All the three contactors of Star Delta Starter shall be of same rating. Rating of contactors shall be based on feeder rating.

All contactors of motor starters shall be suitable for AC 3 duty unless specified otherwise.

2.5.7 Protective Devices:

Intelligent Motor protection relays are required for DOL and Star-Delta feeders instead of bimetallic overload relay or other special relays for incoming & outgoing feeder. These shall be fixed on DIN rails or on mounting boards.

IMPR shall be provided with current measuring module.

The supplier must have a local representative office with qualified support staff to provide training, technical support and service. Please refer to Clause 2.7.13 below for the functional requirements of IMPR for different motors.

The IMPR should provide the communication ports for the connection to the communication network. It should be easily integrated into the communication architecture with remote information access.

It shall be an open communications system, which means that it shall be directly connected to the main industrial network protocols, listed below:

- ModBusSL
- ModBus/ Ethernet
- Profibus DP
- DeviceNet

The IMPR should embed the relevant network protocol in built-in (native) mode.

The IMPR supplier should provide user-friendly software running in a Windows environment to ease the IMPR on-relay configuration. The software should have menus and icons for easy access to the data required, guided navigation to go through all the data of the same function in one screen and with a file management system.

2.5.8 Timers:

The timers shall be continuously adjustable & electronic type, suitable for 240 V, 50 Hz supply. The timers for Star Delta automatic starters shall have time delay of 0 to 60 seconds between change over of contacts..

2.5.9 Push Buttons (PBs):

Push buttons shall be complete with actuator and contact block and shall be generally mounted on doors of the cubicles. Colours shall be as follow:

Stop/ open/ emergency	-	Red
Start/ close	-	Green

It should have minimum 1NO+1NC contacts. Push buttons shall conform to IP - 65 protections against dust and water ingress.

2.5.10 Indication Lamps:

All outgoing & incoming feeders shall be provided with 'ON' indication lamps.

Colours shall be asunder:

Phases: Red, Yellow & Blue

ON	:	Red
OFF	:	Green
TRIPPED	:	Yellow

Indicating lamps shall be of LED (cluster of high intensity light emitting diodes) type, suitable for 240 V AC supply. These shall be provided with translucent covers of red, green and amber colours as required. These lamps shall be of minimum 22.5 mm dia. Indication lamps to be provided for all feeders.

2.5.11 Current Transformers (CTs):

CTs shall be cast resin insulated type. Primary and secondary terminals shall be marked indelibly. CTs shall preferably be mounted on stationery parts. These shall be capable of withstanding momentary short circuit and symmetrical short circuit current for 1 second and shall have a minimum rating of 10 VA. Neutral side of CTs shall be earthed.

Protection CTs shall be of low reactance, accuracy class "5P" and an accuracy limit factor greater than "10". Instrument CTs shall be of accuracy class "1.0" and accuracy limit factor less than "5.0".

Separate CT's to be provided for protection and metering purpose.

2.5.12 Measuring Instruments:

These shall be of square pattern having approximate dimensions 96 mm X 96 mm, flush mounting type. Necessary auxiliary instruments like CTs etc. are also included in the scope of supply.

All AC meters shall be of Digital type for displaying three phases reading. Suitable selector switch shall be provided if the digital meter does not have provision for simultaneous display of three phase readings.

Voltmeter shall be suitable for direct line connection. Voltmeters shall be connected through MCBs only.

Intelligent Panel Meter shall be provided with incoming feeder of the MCC for the measurement and digital display of Multifunctional Electrical Parameters such as voltage, current, active power, reactive power, frequency, power factor, active energy, reactive energy, etc. Data port will be provided to communicate all these parameters to Main PLC Panel through suitable data bus/ signal communication cable.

All motor feeders of 15 HP and above shall be provided with ammeter. Ammeter shall also be provided for all incoming & outgoing ACB / MCCB / switches of rating 100 A & above.

Ammeters shall always be CT operated.

2.6 Special Requirements:

Feeder details for incoming and outgoing for this project as per battery limit to be worked out by the supplier as per the design requirements of the plant. All IMCC motor feeders shall have Soft Starters of suitable ratings (with inbuilt bypass contactor & 3 phase isolation contactor, Aux. relay and IMPR with current measuring module) or VFD including MPCB, start & stop push buttons, ON/OFF/TRIP indicating lamps and SP MCB for control circuit protections. Variable Frequency Drive (VFD) Unit will be provided for a motor feeder irrespective of its rating, only if specifically mentioned by the Purchaser. Suitable Line Chokes will be provided in VFD feeders.

All IMCCs will have feeders with soft starters with communicable intelligent relays and VFDs only. The conventional MCCs will have DOL starters for motors below 10 KW and soft starts for motors of 10 KW and above non communicable soft starters with required protections. All outgoing non-motorized feeders, ancillary panels, other MCCs shall be without communicable relays.

The IMCC motor soft starter feeders with IMPR must have suitable port in IMPR for data communication (soft starter with communication port is not envisaged in that case) and the motor feeders with soft starter must have inbuilt protections for single phasing, phase sequence, over current, overvoltage, under voltage etc. In case of motors having embedded thermistor winding, Soft Starters for these motor feeders should have in-built thermistor relay.

Switchgears with contactors of suitable size are to be provided as per requirement. For capacitor feeders, TP MCCB and capacitor duty contactors of suitable rating shall be provided.

2.6.1 For incoming feeder of rating up to 630 A, 4 pole MCCB & for rating higher than 630 A, 4 pole ACB shall be provided unless otherwise stated in the feeder details.

2.6.2 MCCB, 4 pole shall be provided (unless stated otherwise) for outgoing feeders of rating 63 Amps and above and preferably these shall be located at the lower portion of the panel. These feeders shall have isolating link for neutral in case 3 pole MCCBs are to be supplied as per the requirement given in feeder details.

2.6.3 Electrical interlocking shall be provided between various feeders as required by the process and specified in feeder details. Interlocking will also be provided in software programme of Main DCS Panel.

2.6.4 ON/OFF operation of all motor feeders shall be possible in both Auto mode (PLC signal operation) as well as Manual mode (Push Buttons) from MCC through A/M selector switch. Indication for ON/OFF/TRIP for all motor feeders shall be provided.

2.6.5 Provision shall be made to communicate operational parameters /

data from all incoming feeders to main PLC/ DCS Panel through suitable data bus/ signal communication cable. . Operation parameters of motor feeders like ON/OFF status, actual current, trip status etc shall be communicated. The outgoing feeders should have facility for the feedback.

2.6.6 Supplier has to submit GA, control & power circuit drawing for approval to purchaser before starting manufacturing of MCC.

2.6.7 The following selection table shall be followed for cables of motors unless otherwise specified:

Minimum size of steel braided flexible Copper Cable for various rating of motors (To be laid between IMCC & motors)

Sr. No	Motor rating HP	Full Load Current (Amp.)	Type of Starter	Power cable rating Power cable rating
1	0.5	1	Soft starter	3 C or 4 C x 2.5 sq. mm
2	0.75	1.3	SS	3 C or 4 C x 2.5 sq. mm
3	1	2.6	SS	3 C or 4 C x 2.5 sq. mm
4	1.5	2.7	SS	3 C or 4 C x 2.5 sq. mm
5	2	3.7	SS	3 C or 4 C x 2.5 sq. mm
6	3	4.8	SS	3 C or 4 C x 2.5 sq. mm
7	4	5.2	SS	3 C or 4 C x 2.5 sq. mm
8	5	7.8	SS	3 C or 4 C x 2.5 sq. mm
9	7.5	11.2	SS	3 C or 4 C x 2.5 sq. mm
10	10	16	SS	3 C or 4 C x 2.5 sq. mm
11	12.5	19	SS	3 C or 4 C x 2.5 sq. mm
12	15	20.8	Soft starter	2 X 3 C or 4 C x 4 sq. mm
13	20	28	Soft starter	3 C or 4 C x 6 sq. mm
14	25	34	Soft starter	3 C or 4 C x 10 sq. mm
15	30	40	Soft starter	3 C or 4 C x 10 sq. mm
16	40	53	Soft starter	3 C or 4 C x 16 sq. mm
17	50	65	Soft starter	3 C or 4 C x 25 sq. mm
18	60	78	Soft starter	3 C or 4 C x 35 sq. mm
19	75	96	Soft starter	3 C or 4 C x 50 sq. mm
20	100	131	Soft starter	3 C or 4 C x 70 sq. mm
21	125	156	Soft starter	3 C or 4 C x 120 sq mm
22	150	189	Soft starter	3 C or 4 C x 150 sq mm
23	180	227	Soft starter	3 C or 4 C x 185 sq mm
24	215	271	Soft starter	3 C or 4 C x 240 sq mm
26	250	325	Soft starter	3 C or 4 C x 300 sq mm
27	275	360	Soft starter	3 C or 4 C x 185 sq mm - 2 runs
28	300	390	Soft starter	3 C or 4 C x 185 sq mm - 2 runs
29	335	400	Soft starter	3 C or 4 C x 240 sq mm - 2 runs
30	375	NA	Soft starter	3 C or 4 C x 300 sq mm - 2 runs

Note: Suitable derating factor of cables as per manufacturer's guidelines to be applied where more than one cables feeding to various motors/drives are to be laid in parallel.

2.6.8 Feeder details for incoming and outgoing for this project, as per battery limit and as per the design requirements of the plant, to be worked out by the supplier. The VFDs shall have input chokes on line side. Load side chokes wherever required are also to be included.

2.6.9 Wherever desired distributed I/O s with Communication adaptors or linking devices shall be installed in each shipping split or shipping section and factory wired to each starter unit. MCC shall be connected to remote controller/SCADA via one network of high bandwidth. Network connection from remote controller wherever required is to be made to the communication adaptor/linking devices installed in each shipping unit. However in general it is preferred that all the intelligent relays, Soft Starters and VFD provided in the panels for electrical equipment shall be interfaced to the Central PLC through open protocol communication cable (open networks) for control action and data acquisition/diagnostic information directly at device level. The VFD shall be controlled from the PLC depending on the program and feedback system from field. The configuration is preferable to daisy-chain architecture, in which moving or adding an MCC unit requires interrupting the chain and disabling downstream units. The open networks shall be such as Ethernet, Profinet, Modbus and PROFIBUS.

2.6.10 The specifications of the Intelligent motor control relay (Intelligent motor management relay) shall be as given below:

A) General

The motor management device should conform to IEC 60947-4-1, 60947-5-5 & 60947-8 for overload and thermistor protections. The device should be suitable for operation at ambient temperature up to 55 deg.C. The components in the main circuit (i.e. Current / Voltage measuring devices) should have rated operation voltage of up to 690V.

The device should offer comprehensive motor management functions including Protection, Monitoring, Control and Diagnostics functions as detailed subsequently in this specification.

B) Construction

The motor management & control device should be of the latest technology available. The device should be compact and preferably modular in construction. The device should have integrated communication port for direct link to higher level, with open protocol bus system.

The protection system should be independent/autonomous of the automation system. i.e. Motor protection & control should continue to be available for operation in the event of a communication or automation system failure. The device should have a control voltage of either 24V DC or a wide band control voltage from 110 to 240 V AC/DC, as applicable.

The basic unit shall have the following minimum status display:

- a) Device Readiness
- b) Status of control supply c) Feeder fault indication
- d) Status of communication with PLC

The device shall have facility to test/reset as standard. It shall be possible to select between manual reset (at the device) or remote reset (through PLC/SCADA from control room) It shall be possible to expand the no. of digital inputs / outputs, if required, using add-on modules.

C) Functional Requirements

Protection Functions

The device shall incorporate the following protection function as standard

- a) Overload protection with trip class adjustable from 5 to 40
- b) The device should have an in-built Thermal Motor Model (Thermal Memory)
- c) It shall be possible to adjust the reset time after an overload
- d) Provision for connecting thermistor inputs
- e) Phase failure protection
- f) Unbalance protection with adjustable time delay
- g) Stall protection with adjustable time delay

Monitoring Functions

The device shall incorporate the following monitoring function as standard

- a) Over current monitoring with adjustable time delay
- b) Under current monitoring with adjustable time delay
- c) Earth fault Monitoring with adjustable time delay

When threshold value of above settings exceed, it shall be possible to set the type of response (Warning, Tripping, Signalling and Disable)

- a) Motor Operating Hours monitoring
- b) Motor Stop time monitoring
- c) No. of starts monitoring

When threshold value of above protection setting exceeds, it shall be possible to set the type of response (Warning, Signalling and Disable)

Additionally, the following monitoring functions shall be possible as an option and should be provided for feeders wherever specifically asked for.

- a) Under voltage monitoring
- b) Power factor monitoring
- c) Active Power Monitoring
- d) Phase sequence monitoring
- e) Temperature monitoring via PT100 / PT 1000, NTC, KTY 83/84 inputs
- f) Recording the curves of measured values like current, voltage, power etc.
- g) Monitoring of analog values using Analog I/O modules.

Control Functions

In order to minimize the wiring & interlocks, the device shall have built-in software logics to achieve the various control functions like

- (a) Direct on line starter (DOL)
- (b) Reversing DOL (RDOL)
- (c) Automatic star delta starter
- (d) Pole changing starter
- (e) Dahlander starter
- (f) Positioner
- (g) Solenoid valve

The device may be chosen as per the requirement of the individual feeders.

Logic Function Modules

The Intelligent Motor Control and Protection Device shall offer the following in-built logic functions.

- (a) Truth table
- (b) Timer
- (c) Counter
- (d) Flashing function
- (e) Flickering function

With the above functions it is envisaged to reduce the hardware in the feeder viz. timers. The flashing/flickering functions must facilitate multiple functionality to the same lamp - to glow constantly when the feeder is OFF and flash on the event of a trip caused by a fault.

Standard function blocks

The Intelligent Motor Control and Protection Device shall have standard control function control blocks.

- (a) Check backsignal
- (b) Test Position feedback
- (c) External fault
- (d) Emergency start
- (e) Communication Error
- (f) Testing the device including tripping of the feeder
- (g) Testing the device without tripping the feeder

Diagnostics, Service & Operating Functions

The motor management system shall make available the following diagnostics, service and operating data on the bus system for further processing by the higher level control system. (e.g. PLC/SCADA)

Operating data

The following shall be available at the PLC as part of the cyclic end data:

1. Motor switching state (ON, OFF, Direction of rotation, Right, Slow fast etc)
2. Current (maximum of the 3 phases)

Diagnostic & Service data

- a) The device should be capable of signalling/warning in case of overload of 115% of set current.
- b) It should be possible to set "warning" or "trip" as response for current limits exceed, unbalance in current, earth fault, operating hours exceeded etc.
- c) It should be possible to read from the device the value of last trip current.
- d) In case of a device fault or a trip, the device shall send the diagnostic data to the PLC for the user to analyse. The diagnostic information should consist of Status information on fault type, status information on limits exceeded, Status

information on warnings, device healthiness, bus fault, cooling down period (in case of overload fault), no. of starts, motor operating hours etc.

e) Event log with a capacity to record last 20 events shall be accessible whenever required.

Measured Values:

The device shall by default transmit the current value (maximum of the 3 phases).). Necessary current measurement module to be supplied with IMPR.

However, it shall be possible to access from the PLC other related parameters like percentage of unbalance, power factor, current in the 3 phases, last trip current, time to trip (for a feeder undergoing overload), cooling down period (after an overload trip), active power, apparent power.

Optionally where power/voltage monitoring is specified the following additional data should be available

- a) Voltage in the three phases (Line-to-Line) in Volts
- b) Consumed energy in kWh
- c) Active Power in Watts
- d) Apparent power in VA
- e) Phase voltages in V
- f) Power factor
- g) Phase sequence

D) Configuring & Communication

The supplier shall offer standard software for configuring the device. It shall be possible to configure a device either individually or over a communication network. For this purpose, provision for connecting a laptop should be available at the motor management device.

The device shall have integrated communication facility to communicate directly on a bus system without any additional components.

The device shall be able to transmit cyclic as well as acyclic data to higher-level automation. It shall be possible to define each bit in the cyclic and acyclic data sent to the PLC. The data defined as cyclic shall be fetched by master PLC in a sequential manner. i.e. one slave after other. The critical events like tripping of device or alarm shall be sent to master PLC on priority basis (acyclic transfer) irrespective of the slave sequence.

In order to achieve minimum response time, the device shall be capable of transmitting data at a speed of 12Mbps, suitable for operation with high-speed bus systems.

3.0 The following selection table shall be followed for earthing of electrical loads: All earthing shall be made with two runs.

- Control switches/glands- Copper wire 14 SWG

- Motor/isolators up to 40 HP-copper wire upto cable tray& GIstrip of required sizein cabletray upto earthpit.
- Motor above50 HP upto 125 HP- GIstrip of 40x3 mm.
- Switch board /motor control centre- GI Strip50 x 6 mm
- Earthing main intrenches - GIStrip50 x6 mm

8.9.2 CHILLED WATER BASED UNITS FOR IMCC/MCC ROOM Quantity : 1 Lot

Suitable number of chilled water-based fan coil units are to be provided in IMCC room to keep the room temperature at 22 deg C. The FCU shall be heavy duty industrial type having SS tubes with aluminium fins, SS enclosure, air inlet filter (removable type for cleaning purpose), insulated drain tray and provisions for celing suspension installation. The unit shall be supplied by a specialist manufacturer as fully assembled unit. The make and type are subject to approval.

ELECTRICAL DISTRIBUTION SYSTEM

Purchaser shall provide electrical power at New Sub-station PCC. The scope of the Bidder starts from the laying of cable from the UHT plant Feeder in the PCC. From there on it shall be responsibility of the Bidder to design a suitable electrical system as per the latest IS specification, Indian electricity rule, including special requirements of concerned state electricity Inspectorate. The system shall be designed to receive, control & distribute electrical power to all prime movers & other consumption points with all necessary controls for plant at 415V, 50Hz AC. The acceptable variation in voltage is +/- 5% & frequency is +/- 3%.

Pack-1 supplier shall supply Intelligent motor control centres for pack 1 (Pre-Process & UHT) and Pack2 (APS section)

Pack-1 supplier shall Provide power including required size and type supply cable to all consumption points of pack-2 plant (APS) alongwith termination upto the consumption point including providing cable trays , support etc. Pack-1 (UHT) supplier to provide 3 phase UPS based supply to the power consumed by pack-2 supplier. Pack-2 supplier (APS). Pack-2 supplier shall provide location of power consumption points and its rating in their bid.

The UPS Power for critical loads in UHT section shall be drawn from the outgoing feeders in UPS power distribution board being provided by the APS section bidder. Distribution cable including end terminations at both ends are included in the scope.

The scope would consist of design, supply, installation, testing and commissioning of Intelligent Motor Control Centers & Conventional Motor Control Centre with complete switchgears. All motorized feeder shall be communication capable through field run bus. Incomer feeder, all outgoing non-motorized feeder & all ancillary panels with complete switchgears & electrical shall be non-intelligent type.

Required quantity of armored power cable with GI/GRP/FRP ladder cable tray (PCC to IMCC/MCC), steel braided copper conductor flexible power cable (outgoing)/control cable, steel braided flexible copper instrument cable, SS cage / perforated trays for power/control/instrument cables (separate tray for instrument cable), plate type earth pit (GI for power & Copper for electronic), earthing network/earthing conductors (GI for power & Copper for electronic), Motor Isolators, Emergency PB station near motors for emergency isolation, DBs, rubber mats for panels etc. shall be provided. Power cables shall be suitable for use on 415 V system, shall be of 1100 V grade. PCC to all IMCC, power cable shall be Aluminum conductor HR PVC/ XLPE insulated, armored and overall PVC sheathed strictly as per IS 1554 / 7098 (Part -I, 1976 - Amended up to date). Power (up to 70 sq.mm) & control cable from IMCC to all motors & other panels shall be Steel Braided copper power cable. The outgoing power & control cables shall be Rodent proof FR type.

The installation of the electrical shall be carried out as per respective clause of the tender (chapter electrical installation of the tender-part IV). The detailed specification of the required electrical system is provided in subsequent sections.

15% spare feeders of various ratings shall be supplied in each of the IMCCs/MCCs (Bidder to optimize the distribution to cover all ratings however max rating is limited to 22KW.). The spare feeders shall be prewired with switchgears , with soft starters but without VFDs. VFDs For spare feeders (upto 22KW) shall be supplied under spares . For VFDs having rating greater than 22 KW , 15% spares to be supplied loose with all accessories (power & communication cards, fuses & fuse links) under spares.

Note:

All the electric motors shall be energy efficient IE-3 motors. However, in case of OEM equipment, where IE-3 is not available, IE-2 motor can be accepted as minimum standard. All the VFD driven motors shall be designed for inverter duty.

1.1 INTELLIGENT MOTOR CONTROL CENTRE / CONVENTIONAL MOTOR CONTROL CENTRE

Following IMCCs are envisaged for the plant. The feeders in each IMCC shall be as per the functional / design requirement:

IMCC – I PRE- PROCESSING & UHT STERILIZER SECTION (Pack -1) ALL CONSUMPTION POINTS AND OUTGOING FEEDER FOR APS SECTION

IMCC (Pack-2)

The Bidder shall provide XLPE/HR-PVC insulated armoured aluminium power cable from PCC to IMCCs. The Bidder shall terminate the cables at both ends i.e., at PCC & IMCCs. Bidder shall provide the electric load details for each IMCC.

The motor control center shall be completely dust & vermin proof conforming to IP 42 standard. The IMCC shall be fabricated, as per detailed specification. The IMCCs would receive, control & distribute electrical power at 433 V, 50 Hz AC to all electrical loads.

All the panel boards (IMCCs) are to be fabricated by the panel builder whose sample panel boards have been type tested and approved by CPRI. Necessary proof (short circuit test temperature rise test and ingress protection test reports) to this effect are to be submitted and NDDB's approval is to be obtained prior to taking up the panel fabrication work.

Type

The MCC shall be suitable for indoor installation. It would be fabricated as per detailed specification described and as per IP 42.

Bus bar rating

The bus bar shall be capable of carrying 1.25 times of full load current of respective IMCC

Incomer

The Incomer shall have 4 poles ~~EDQ~~ / MDO , ACB of suitable rating / type with solid state / Microprocessor based protective device with all accessories. Also the Incomer shall have 3-phase 4-wire communicable energy meter with necessary Indications and CT's and phase Indication lamps.

Bidder to consider – All MDO type ACB.

For Incomer of the panel, the rating of the switchgear shall be 1.25 times of rated full load current of connected load of the panel.

Out-going Feeders

The Bidder shall provide the outgoing feeders to all the electrical drives covered in the section.

One no of 100 A TPN MCCB unit for welding point shall be provided in each MCC. IMCC shall be provided with 2 nos. of RTD sensors for temperature monitoring.

15% spare feeders of various ratings shall be supplied in each of the IMCC

without VFD (Bidder to optimize the distribution to cover all ratings). 15% spare VFDs (upto 22KW) to be supplied loose with all accessories. Necessary cards for VFDs (above 22KW) shall be supplied under spares.

1.2 POWER FACTOR CONTROL AND ACTIVE HARMONIC FILTER SYSTEM

Quantity : 1 No (as per function/design requirement)

Active harmonic filter panel with inbuilt power factor correction facility as per the plant requirements to improve the power factor up to 0.99 lag shall be provided. The complete operation of the APFC/AHF shall be automatic. However, it shall also be possible to switch ON/OFF the capacitor banks through push buttons manually. Ammeters shall be provided for each capacitor bank. Capacitor duty contactors with 7% detune reactor (copper) shall be provided with each capacitor bank.

1.3 COMMUNICATION CAPABLE FREQUENCY DRIVE WITH IN BUILT CHOKE FOR ALL ABOVE MOTORS WHEREVER MENTIONED OR VARIABLE DUTY IS REQUIRED.

Quantity : 1 No (as per function/design requirement)

Wherever mentioned in the specifications and wherever there is variable duty for the equipment VFDs shall be provided. The VFD shall be smart type with diagnostic features. The VFDs should be configurable from the HMI/Operating console as well as in the field. The VFDs shall have best accuracy and reliability as available in the market with required IP protections. The Bidder to quantify the numbers of VFDs required based on the tender as well as the functional requirements and offer accordingly. The VFDs shall have DC choke (in built harmonic filter) apart from external AC line filters as per the requirements. In sensitive locations RFI should be provided to avoid any interference to adjacent electronic unit. Derating factors considering the panel location and ambient temperatures should be taken while selection of the rating of the VFDs.

1.4 SOFT STARTERS

Quantity : 1 No (as per function/design requirement)

All the motors without VFD shall have soft starters feeders through communication capable IMPR.

2. CABLES & OTHER ELECTRICAL ACCESSORIES

Supply, laying and termination of required quantity of armoured LT power cables from PCC to MCCs (Armoured aluminium cable) and MCC to respective motors (steel braided cable copper conductor upto 70 sq.mm sizes above 70 sq.mm copper conductor armoured cable of approved make)/copper braided control / Instrument cables of suitable sizes with cabling accessories in excavated trench / GI cable trays and GI conduits for outdoor shall be carried out. Necessary SS perforated / cage / ladder cable trays, SS conduit pipes

within plant area, earthing conductor, earth pits, and emergency stop and motor isolator in SS enclosures shall be provided.

The sizes of power cables for different capacity of loads / motor rating shall be as indicated in cable selection charts. All the power & control cables shall be laid through SS cage/perforated/ ladder tray, SS shrouds for all pumps & motors shall be provided. Supply & placement of rubber mats of proper size as per Electrical Inspectorate rules shall be provided.

All the electric motors shall be energy efficient IE-3 motors. However, in case of OEM equipment, where IE-3 is not available, IE-2 motor can be accepted as minimum standard. All the VFD driven motors shall be designed for inverter duty.

All the VFD driven motors shall be designed for inverter duty. Power & electronic earthing shall be separate.

2.1 POWERCABLE(LT)

Quantity : 1 No (as per function/design requirement)

Power cables for use on 415 V system shall be of 1100 volt grade, steel braided PVC insulated and PVC sheathed copper conductor upto 70 sq. mm conductor size and above 70 sq. mm HR PVC / XLPE insulated, PVC sheathed, armoured and overall PVC sheathed copper conductor. Cables from PCC to IMCC shall be XLPE insulated, PVC sheathed, armoured and overall PVC sheathed aluminium conductor strictly as per IS : 7098 (Part I) – 1988.

Unarmored cable to be used for vibrating equipment & only if specifically mentioned in schedule of quantities.

The size of these cables shall be as specified in single line diagram. The minimum size shall be as per the table given above.

All the cables from PCC to IMCC shall be XLPE insulated armoured aluminium conductor.

All the cables from IMCC to various motors/loads in the plant shall be steel braided copper flexible cable up to 70 Sq.mm and XLPE/HR-PVC insulated armoured multistrand copper conductor above 70 Sq.mm.

2.2 CONTROL CABLE

Quantity : 1 No (as per function/design requirement)

Control cables for use on 415 V. system shall be of 1100 volts, 1.5 mm², copper braided copper flexible conductor copper conductor, PVC insulated, PVC sheathed and overall PVC sheathed.

2.3 INSTRUMENT/COMMUNICATION CABLES

Quantity : 1 No (as per function/design requirement)

Instrument cable shall be of multi-stranded annealed plain copper conductor, extruded PVC type A insulated. Overall screened with Al. Mylar tape along with tinned copper, drain wire of size 7/ 0.30 mm. Extruded PVC ST1 inner sheath, un-armored/copper bradded. Extruded PVC type ST1 outer sheathed instrument signal cables.

All instrument cables shall be rodent proof. Min. Size of the instrument cable shall be 0.75 sq.mm.

The outside plant building cabling of communication cables and instrument cables of suitable sizes shall be laid with cabling accessories with GI cable trays and GI conduits.

2.4 ACCESSORIES

Quantity : 1 No (as per function/design requirement)

SS CABLE TRAYWITHIN PLANT

SS cage/ perforated cable trays shall be used for laying of the cables within the plant and outside the plant, inside MCC room, utility area and PCC to MCC for main power cables GI perforated cable tray/PVC ladder type.

Within the MCC room GI perforated cable trays shall be used.

All cable trays (SS wire mesh / GI perforated / GI ladder) type shall be without covers.

These shall be perforated type, heavy duty, inward bend shape, manufactured from mild steel conforming to IS-226 and hot dip galvanized as per IS-2629/BS-729. Width of cable tray shall be as per the requirement. Height to be minimum 50 mm and thickness of plate shall be 1.5 mm up-to 300 mm cable tray width. For cable trays having width more than 300 mm, height to be 75mm and thickness of plate shall be 2.0 mm. Cable trays shall be of standard lengths of 2.5 M. Necessary accessories of cable trays such as coupler side plates for joining cable trays, bends, riser, inside riser, tee etc. shall also be supplied.

Cable tray for automation/network /signal cables shall be separate from power and control cables. SS ladder / cage type cable trays shall be provided with in the plant except for incoming power cables to MCC and outside the plant building in Perforated GI type with cover. Vertical dropout shall be ladder / cage type SS cable tray.

CABLE GLAND

Quantity: 1 Lot

These shall be provided at both ends of armoured/ unarmored electrical cables. Cable glands shall be manufactured as per performance requirements of BS 6121, amended as on date, with brass material accurately machined and nickel-plated. These shall be of heavy duty single compression type for cable conductor sizes above 35 Sq. mm and weather proof double compression type for cable conductor sizes upto 35 Sq.mm. Single compression cable glands shall be complete with checknut, gland body, 3 nos. metal washers, outer seal rubber ring and compression nut. Double compression glands shall be complete with checknut, gland body, neoprene outer ring, armour clamping cone, armour clamping ring, armour clamping nut, skid washer & outer seal nut. For steel braided cables polyamide gland shall be provided.

CABLE CONNECTOR

Quantity: 1 Lot

Cable connectors, lugs/sockets, shall be copper/Aluminium alloy, suitably tinned, solderless crimping type.

CABLE ROUTE MARKER

Quantity: 1 Lot

These shall be galvanized cast iron plate with marking (LT/HT) diameter 150 mm with 600 mm long 25x25 mm HS angle riveted/bolted with this plate.

CABLE INDICATOR

Quantity: 1 Lot

These shall be self-sticking type and of 2 mm thick lead strap for overall cable. PVC identification numbers, ferrule shall be used for each wire.

CONDUIT

Quantity: 1 Lot

All the cable drops shall also be in open ladder /cage / Perforated type SS cable trays. However wherever conduits are required shall be of SS 304.

MOTOR ISOLATORS/EMERGENCY P.B.S (SS304)

Quantity: 1 Lot

Push button with plug and socket type emergency push button station shall be provided up to 30 HP. Above 30 HP only push button without plug and socket shall be considered.

These isolators shall be installed inside the main plant or outside as per the site conditions for isolating the power from motor. This shall be of polycarbonate/thermoplastic plug and socket (IP 65 protection) type of isolator.

General requirement:

The plug & socket /isolator box should be of SS 304 plate, dust ,vermin and weather proof suitable for wall/structural mounting. All external hardware used must also be of stainless steel. All the mating surface should be provided with round rubber gasket (min 6 mmm) in the groove so as to make it efficient dust and vermin proof.

Each plug and socket box should must be provided with emergency push button. One no hole of required diameter at the bottom for cable entry must be provided. Connection to the motor shall be through flexible copper cable. 30 amps 6 way terminal block is to be provided inside the isolators. All wires /cables must be terminated using crimping type tinned copper lugs. Two nos brass screws with washer shall be provided on the either side of the box for earthing.

EARTHING PITS

Suitable dia Copper /GI pipe in pipe Chemical earthings with minimum 3 m long pipe for the panels and the equipments shall be provided. The earthing pits shall be complete with Plate, electrode, watering pipe and chamber with cover.

- GI pipe chemical earthing 3 m long for MCC panels and equipment's : Suitable
- Copper plated pipe earthing 3 m long for Automation : Suitable
 - Separate and required no earthing pits and earthing cable upto all Electrical equipments for APS section upto the consumption point including matching transformer.

Bidder to consider chemical Earthing.

8.11 SS STRUCTURE:

8.11.1 SS - 304 Structural platform for Blending/ For UHT Processing area/ CIP Kitchen / Pipe & Cable Tray Supports/ Working Table,

Quantity:1 Lot

As per general description given in basis of design. All pipe & cable tray supports inside the plant/corridor shall be of SS-304 box section.

Details to be enclosed with bid (to be finalized during detail engineering as per functional requirement).

8.12 GALVANISED STRUCTURE:

8.12.1 MS (GI) Structural For Outdoor Pipe Bridge/, Spiral Staircase etc.

Quantity:1 Lot

~~1.0 RCC Pedestals up to a height of 500 mm above ground level for crossover bridge (if required) for supporting utility pipes & cables shall be provided by purchaser.~~

~~2.0 These shall be provided for fabricating platforms, outdoor pipe support service bridges etc.~~

~~3.0 These shall include ISMB, ISMC, angles, flats, bars, MS plates, chequered plate, hand rails of minimum 900 mm height, toe guard etc. The platforms shall have frame underneath and bracing members of suitable sections. Access ladders and structural supports of C class pipe/ISMC channel shall be provided within the scope of the works for structural works quoted.~~

~~Other details as per general description given in basis of design & battery limit.~~

8.13AUTOMATION SYSTEM:

8.13.1 AUTOMATION HARDWARE

Quantity:1 Lot

As per general description given in basis of design. Details to be finalized during detail engineering as per functional requirement.

8.13.2 AUTOMATION SOFTWARE

Quantity:1 Lot

As per general description given in basis of design. Details to be finalized during detail engineering as per functional requirement.

8.13.3 AUTOMATION ACCESSORIES

Quantity:1 Lot

As per general description given in basis of design. Details to be finalized during detail engineering as per functional requirement.

8.13.4 COMMUNICATION NETWORK ACCESSORIES, INSTRUMENT / SIGNAL CABLES / WIRES & RELATED ITEMS

Quantity:1 Lot

As per general description given in basis of design. All instrument/signal cables/wires shall be shielded/screened type. Details to be finalized during detail engineering as per functional requirement.

8.13.5 FIELD INSTRUMENTS

Quantity:1 Lot

As per general description given in basis of design. All instrument/signal cables/wires shall be shielded/screened type. Details to be finalized during detail engineering as per functional requirement.

8.13.7 MISC. AUTOMATION / INSTRUMENTATION / ELECTRICAL ITEMS

Quantity:1 Lot

As per general description given in basis of design. Details to be finalized during detail engineering as per functional requirement.

8.14.1 STEAM & WATER MIXING BATTERY

Quantity:1 Lot

Battery shall consist of temperature control arrangement with regulator, temp. gauge, & nozzle/gun with 15 M heavy duty hose. LP steam shall be used from the nearest header & raw water shall be utilized in parallel. Details to be finalized during detail engineering.

8.14.2 Misc. Items Including Smoke Detection / Alarm & Fire Extinguishers etc. As Per Statutory Requirement

Quantity : 1 Lot (Including general & special tools for O&M of equipment supplied)

As per general description given in basis of design. Smoke detection & alarm system for IMCC room. Fire extinguishers to be provided as per statutory requirement. Details to be finalized during detail engineering as per functional requirement.

8.15 SPARES:

Spares One Years of Normal Operation (Mechanical Electrical / Instrumentation & Automation) As Per OEM's recommendation

Quantity: 1 Lot (As per OEM)

As per general description given in basis of design. Details to be finalized during detail engineering as per functional requirement. Commissioning spares will not be included which are to be supplied as per requirement within the quoted price.

VFDs or cards shall be supplied under spares.

8.16 TRAINING, SERVICE COVER & STANDBY OPERATION:

Quantity: 1 Job

As per general description given in basis of design. Details to be enclosed with bid (to be finalized during execution).

8.17 DOCUMENTS/MANUALS:

DOCUMENTS / MANUALS (Hard & Soft Copy)

Quantity: 1 Job

As per general description given in basis of design. Details to be to be finalized during detail engineering as per functional requirement.

8.18 FURNITURE FOR UHT CONTROL ROOM

Quantity: 1 Lot

~~As per general description given in basis of design. Details to be to be finalized during detail engineering as per functional requirement.~~

GENERAL TECHICAL REQUIREMENT FOR PUMP, PHE & ANKS

1.Pump:

Milk pump casing shall be of AISI 304 & working parts including impeller / shaft shall be of SS-316 with mechanical seal. The pump shall be high efficient type & selected based on best efficiency for the duty.

Prime mover: 3 Phase, 415 V (+ 10%), 50 Hz (+ 5%), IE-3 (as per availability), TEFC, squirrel cage AC induction motor with IP 55 degree of protection with Class "F" insulation of suitable HP.

Stainless steel (AISI 316) inlet and outlet should end in stainless steel complete SMS union. Quick opening sanitary fittings.

The motor part of the pump should be provided with stainless steel AISI 304 shroud. The shroud should be easily dismountable. It should have provisions for air circulation and entry of electric cable.

All stainless steel surfaces are to be polished to 150 grits.

Bidder to provide additional CIP supply & return pump (other than quantified section-wise in tender) to meet functional/operational requirement.

2. Plate Heat Exchanger (PHE)

The sealing gaskets must ensure complete sealing and prevent any cross leakage between product and service liquids. Gaskets shall be of sanitary type. It should be of "SNAP-ON / CLIP ON" glue-less type.

The inlets and outlets for chilled water/hot water and product should be provided with complete stainless steel (AISI 304) forged type SMS unions.

All weld joints are to be ground smooth and finished to 150 grit. All stainless steel surfaces are to be polished to 150 grits.

Essential special tools should be supplied with each PHE without charging any extra cost.

Mounting arrangement of temperature sensors for local digital indication as well as for monitoring from control room OS on each inlet and outlet port of each section shall be provided. The plate diagram should be submitted.

A safety device should be provided in the hot water side of heating section (plate pack) to avoid damage to the heat exchanger caused by excessive pressure. It should be of sanitary design.

A suitable steam pressure reducing valve, steam control valve with PID controller along with by-pass valves should be supplied with the pasteurization plant so that the steam pressure is limited within 1.5 kg/sq cm.

The condensate assembly from the pasteurizer shall end with a CS strainer; float type steam trap (pumping traps) and by-pass CS ball valves.

Automatic controls should be provided to ensure that the pasteurization temperature is maintained. If the required temperature is not reached, the flow of product should be automatically diverted back to the float balance tank with an audiovisual alarm. The flow diversion valve shall be of electro pneumatic type. The temperature accuracy should be $\pm 0.50^{\circ}\text{C}$.

A name plate of suitable size and its fixing bracket made out of AISI 304 material shall be provided on the front supporting block.

SS Storage tank

The volume of the tank should be such that after filling it up to the rated capacity, the level would be 100 mm below the line where cylindrical shell joins the conical top.

The only metal to metal contact between the inner and outer shells should be at the places where fittings for the tank are provided. All stainless steel welding joints are to be ground smooth and polished to 150 grits.

All stainless steel surfaces shall be left with original mill finished or polished to 150 grits.

The insulation should be applied in staggered joints. All joints should be sealed with bitumen. The bitumen should be applied uniformly on both the surfaces of first and second layers of insulation and on inside surface of third layer of insulation.

Sampling valve should be provided on the inlet-cum-outlet nozzle pipe and should be in stainless steel (AISI 304) construction having sanitary design.

The portion of the thermo well, which is in the jacket, should be insulated with rock wool or equivalent and totally shrouded so that hot water or chilled water does not come in contact with the insulating material.

Lifting Lug: Stainless steel (AISI 304) lifting lugs should be provided at top - 3 nos.

The tank shall be manufactured following good manufacturing practices.

A name plate and its fixing bracket made out of AISI 304 material shall be provided.

Insulation & Cladding :

Insulation: Shell & top cone: A layer of 15 mm thick PUF insulation (30-35 Kg/M3) followed by EPS (16-20 Kg/M3) in two layers of 50 mm each including vapor barrier.

Bottom Insulation- Fully PUF injection of density 100 Kg/M3 or 1st layer from inside 15mm thick PUF insulation of density 35 kg/m3 and remaining to be filled up with EPS (20 kg/m3) with staggered joints and sealed with hot bitumen.

Procedure:

1. Hot bitumen should be applied on outer surface of inner shell and top cone of milk silos/tanks.
2. 1st layer of insulation: Hot bitumen to be applied on surface of 15 mm thick PUF having density 30-35 kg /m3 and this surface to be applied radially on outer of inner shell & top cone.
3. All joints of 1st layer to be made staggered and sealed with either CPRX compound or hot bitumen to ensure no air pockets in joints.
4. Again hot bitumen to be applied on outer surface of 1st layer of insulation.
5. 2nd layer of insulation: Hot bitumen to be applied on surface of 50 mm thick EPS having density 16-20 kg /m3 and this surface to be applied longitudinally on outer surface of 1st layer of insulation.
6. All joints of 2nd layer of insulation also to be made staggered and sealed with either CPRX compound or hot bitumen.
7. Again hot bitumen to be applied on outer surface of 2nd layer of insulation to ensure no air pockets in joints.
8. 3rd layer of insulation: Hot bitumen to be applied on surface of 50 mm thick EPS having density 16-20 kg /m3 and this surface to be applied longitudinally / radially on outer of 2nd layer of insulation.
9. All joints of 2nd layer also to be made staggered and sealed with either CPRX compound or hot bitumen to ensure no air pockets in joints.
10. Alkethene sheet of 50 microns as vapor barrier should be provided on outer surface of 3rd layer of insulation prior to provide the outer cladding.

Note:

1. Hot bitumen should be of grade 85/25 confirming to IS 702
2. To ensure no air pockets in joints, hot bitumen should be applied on all the four side faces of PUF /EPS slab

3. Inner surface of outer cladding should be applied with black bitumen paint.
4. The gap inside the H type MS stiffener rings should also be filled with PUF/EPS.
5. Internal cut of required size should be provided on PUF / EPS slabs for applying the insulation in radial / longitudinal direction.
6. Joints of any layer of insulation should be staggered in respect of the joints of its previous or successive layer of insulation.

Drive Unit for agitator: Drive Unit for agitator: The driving geared motor for the agitator shall be of suitable capacity with helical gear. The geared motor shall be complete with key in the driven shaft, oil level indicator, oil filling plug, oil breather, drain plug and suitable geared oil for the first charge of the geared motor to be provided. The electric motors shall be energy efficient IE 3, TEFC, squirrel cage induction type with IP 55 degree of protection with class “F” insulation, suitable for 415 V (+/- 10%), 50 Hz (+/- 5%) three phase AC supply. Performance of motor in general should confirm to IS: 325 – 1996. The geared motor should be provided with stainless steel AISI 304 shroud. The shroud should be easily dismountable. It should have provisions for air circulation and entry of electric cable.

Safety valve for steam release and pressure gauge on the main steam inlet nozzle should be provided for jacketed vessel. For all CIP & past. water heaters, pumping type.

For pipelines, compact type condensate outlet assembly should be provided with strainer, float type steam trap, sight glass and by pass valve arrangement.

General:

Manufacturing Code: The equipment shall be manufactured following good manufacturing practices.

All the floor mounted equipment should have AISI 304 ball feet with provision for height adjustment of 50 mm.

The purchaser shall approve detailed general arrangement drawing of fabricated items.

Inspection & Testing: OMFED reserve the right to inspect the equipment during various stages of fabrication. All necessary testing shall be conducted in the manufacturer's works.

List of Preferred Make

CIP return pump	AlfaLaval/APV/GEA/FRISTAM
CIP spray balls	Alfalaval/GEAtuchenhagen
PLC/Automation system	Siemens/AB
VFD(Latestmodel)	Danfoss
Temperature / Pressure transmitter	EndressHauser / Baumer
RTD	EndressHauser / Radix / Baumer
LevelSwitch	EndressHauser / Baumer / IFM
ControlValve	Samson/Dembla
Pressure & Temperature Gauge	GIC/Wika/Fiebig
ElectricMotor	ABB/Siemens/CG,motorofefficiencyclassIE3
MCCB/MCB	L&T/Schneider
PushButton	L&T/Teknic/Schneider
LED	L&T/Teknic/Schneider
LT power cable copper (Flexiblewithshieldedcable)	LAPP/SBEE/KEI / RR KABEL / KEU
Signal and Instrument cable (Flexible with shielded cable)	LAPP/SBEE/KEI / RR KABEL
Cable trays	Swastik
SS seat type pneumatic valve	AlfaLaval/GEA/SPX
Pneumatic SSbutterfly/ball valve	AlfaLaval/GEA/SPX
Air line accessories	SMC/Festo/Nucon/Shavonorgen

APPENDIX – I: List of Makes

Description	Makes
SS Milk & CIP Supply & Hot water Pump	SPX / ALFA LAVAL / GEA / FRISTAM
SS Hot Water Pump	GRUNDFOSS/WILO
SS Cream Pump (Progressive Cavity type)	ROTO / ROTOMAC / NETZSCH
SS Lobe Pump	ALFA LAVAL / GEA / FRISTAM/ SPX
SS Shear pump	FRISTAM / ALFA LAVAL /SPX
PHE Type Milk Chiller / Pasteurizer	TETRA PAK/GEA/SPX
PHE Type Water & CIP Solution Heater	TETRA PAK/GEA/SPX
Chemical dosing AODD pump	WILO/XYLEM
Milk & CIP Hoses	SAINT GOBAIN / MTG /TRELLEBORG
UHT Sterilizer	TETRA PAK/GEA/SPX
Aseptic homogenizer	TETRA PAK/GEA/SPX
Aseptic storage tank	TETRA PAK/GEA/SPX
SS CIP Return Pump (self- priming)	SPX / ALFA LAVAL / GEA / FRISTAM
Silo /Tanks Agitator	PRG/LENKA
Online Inkjet Printer	DOMINO
Online Metal Detector	METLER TOLEDO / DAS ELECTRONICS / BIZZERBA
High Shear Mixer/Tri-blender	TETRA PAK/SPX
EPS / PUF Insulation Materials	LLOYDS / BEARDSELL / FRICK
SS Vertical Water / Chilled /Hot Water Pumps	GRUNDFOSS/WILO
VFD	SIEMENS / ALLEN BRADLEY / DANFOSS /SCHNEIDER
Level Transmitter & indicator	E&H / EMERSON / ANDERSON NEGELE / JUMO
Temperature / Pressure Transmitter	E&H / EMERSON / ANDERSON NEGELE / JUMO / BAUMER
Conductivity & pH Transmitter	E&H / EMERSON / ANDERSON NEGELE / JUMO
Density transmitter	E&H / EMERSON / ANDERSON NEGELE / JUMO
RTD for Tanks	E&H / EMERSON / ANDERSON NEGELE / JUMO / RADIX / BAUMER
RTD for Lines	E&H / EMERSON / ANDERSON NEGELE / JUMO / RADIX / BAUER
Flow Switch	E&H / EMERSON / ANDERSON NEGELE / JUMO / IFM / BAUMER
Proximity switch	TETRA PAK / P&F / IFM / SICK
Level Switch	E&H / EMERSON / ANDERSON NEGELE / JUMO / BAUMER
Vortex / Magnetic Flow meter	E&H / EMERSON / ANDERSON NEGELE / JUMO
Mass Flow meter	E&H / EMERSON / ANDERSON NEGELE / JUMO
Control Valve	SAMSON / FORBES MARSHALL-ARCA /DEMBLA
Pressure switch / temp switch	DANFOSS / ALCO / HANSEN / PARKER / E&H/ EMERSON / ANDERSON NEGELE / IMF
Pressure & Temperature Gauge	FIEBIG / H GURU / WAAREE / WIKA / PRICOLFIEBIG / H GURU / WAAREE / WIKA / PRICOL
Dual type Pressure / temp gauges	FIEBIG / H GURU / WAAREE / WIKA / PRICOLFIEBIG / H GURU / WAAREE / WIKA / PRICOL
Temperature digital indicator / controller	E&H / EMERSON / ANDERSON NEGELE / JUMO / RADIX
Load Manager Power // Energy/ Monitor	ROCKWELL/ SIEMENS / ABB / L&T / SCHNEIDER
PC (Personal Computer) /Monitor	HP / DELL

Network Switch	SIEMENS
DCS / PLC System	SIEMENS / SCHNEIDER / <u>AB</u>
Automation System	SIEMENS / SCHNEIDER / AB
Electric Motors	SIEMENS
Air Circuit Breaker	L&T / SIEMENS / SCHNEDIER
MCCB	L&T / SIEMENS / SCHNEDIER
MPCB	L&T / SIEMENS / SCHNEDIER
Contactors	L&T / SIEMENS / SCHNEDIER
Starter Overload Relays	L&T / SIEMENS / SCHNEDIER
Intelligent Motor Protection Relays	L&T / SIEMENS / SCHNEDIER
Timers Electronic	L&T / SIEMENS / SCHNEDIER
Switch Fuse Units	L&T / SIEMENS / SCHNEDIER
MCBs	L&T / SIEMENS / SCHNEDIER
Push Buttons	L&T / SIEMENS / SCHNEDIER
Indicating Lamps (LED)	L&T / SIEMENS / SCHNEDIER
Digital Ammeter & Voltmeter	L&T / SIEMENS / SCHNEDIER
Analog Ammeter & Voltmeter	RISHABH / IMP / MECO / AE
Digital Energy Meter	L&T / SIEMENS / SCHNEIDER
PVC Conduit & accessories	PRECISION / CLIPSAL / POLYCAB/ P – PLAST
Digital Power Factor Meter	L&T / SCHNEIDER
Programmable Protection Relay	L&T / SCHNEIDER
Current Transformer	L&T / NEWTEK / PRECISE / AE
Programmable Protection Relay	L&T / SCHNEIDER
Current Transformer	L&T
LT armoured Power Cables	KEC (RPG) / FINOLEX / RR KABEL / POLYCAB / KEI
LT armoured Copper Control Cables	KEC (RPG) / FINOLEX / RR KABEL / POLYCAB / KEI
LT steel braided copper power & control cables	LAPP KABEL / SBEE / RR KABEL / KEI
control cables LAPP KABEL / SBEE Signal & Instrument cable	FINOLEX / POLYCAB / RR KABEL / KEI
Power Capacitors	L&T
APFC Relay	L&T / SIEMENS
Cable Tray	INDIANA / MEK / PILCO / ELCON / METALICA PRESSINGS / POWER CONTROLS / OBO/ SWASTIK
Isolating Switches	L&T / SIEMENS
HRC fuses	L&T / SIEMENS
Rotary Selector Switch	L&T / SIEMENS
Cable Glands	LAPP KABEL / DOWELS
Cable Lugs	LAPP KABEL / DOWELS
Electronic Soft Starter	L&T / SIEMENS
Servo Voltage Stabilizer	SUVIK / APLAB / NEEL / CRYCARD
UPS	EMERSON / HI-REL / DB ELECTRONICS/ SOCOMEC / REILO
SMF Battery	EXIDE
Water Valves (Butterfly / Ball)	L&T / GEMU / INTERVALVE / CRESCENT / LEADER

VALVES & PIPES (MS & GI)-	
Water Valves (Butterfly / Ball)	L&T / GEMU / INTERVALVE / CRESCENT / LEADER
Water Valves (Diaphragm)	SAUNDERS / BDK / GEMU/BURKERT/ AS PER OEM
Non-return Valve for water	L&T/ INTERVALVE / LEADER / KIRLOSKAR / EXPERT
Water Foot Valve	KIRLOSKAR / GG / LEADER
GI Pipes for water	TATA / JINDAL / MST / ZENITH / KALYANI
MS Pipes for air, steam, condensate	TATA / JINDAL / MST / ZENITH / KALYANI
NRV for Air / Oil Line	INTERVALVE / L&T / LEADER / EXPERT
Angle Seat Valve for water lines	DANFOSS / AVCON / BURKERT
Water Flow Meter (analogue)	DASHMESH / ANAND ASAHI / KENT
HP / LP Steam Valves Piston type	FORBES MARSHALL / SPIRAX / ARMSTRONG, USA / UNI KLINGER
Automatic Pumping Trap / SOPT	FORBES MARSHALL / ARMSTRONG, USA/ SPIRAX
Steam relief valve, traps & strainers	FORBES MARSHALL / ARMSTRONG, USA/ SPIRAX / THERMAX
Steam Pressure Reducing Valve	FORBES MARSHALL/ ARMSTRONG, USA/ ARCA / SPIRAX
Steam Pressure Reducing Station	FORBES MARSHALL/ ARMSTRONG, USA/ ARCA / SPIRAX
SS PIPES & VALVES	
SS Pipes	APEX TUBES/VENUS/VARDHAMAN/ RATNAMANI / BHANDARI FOILS & TUBES
Pneumatic SS Butterfly / Ball type valves	ALFA LAVAL/ GEA TUCHENHAGEN / SPX /
SS Manual Valves & Fittings	ALFA LAVAL / GEA

AIR COMPRESSORS & AIR LINE FITTINGS	
Air lines accessories	SHAVO NORGEN / FESTO / SMC / AIRMATIC / LEGRIS / JANATICS
Auto Drain Valve	INGERSOL RAND / ULTRA FILTER / ZANDER / JORC / PURIFLAIR /SMC/ As per OEM
MISCELLANEOUS ITEMS	
Geared Motor / Gear Box	BONFIGLIOLI / IC BAUER / SEW / EURO DRIVES/ PBL
Steam-Water Mixing Battery with temp. controller	FORBES MARSHALL / ARMSTRONG, USA / SPIRAX
Steam powered pump	FORBES MARSHALL/ ARMSTRONG, USA/ SPIRAX
Chilled water-based fan coil unit	CARRIER / BLUE STAR / STAR COOLERS / VOLTAS
Structural Steel	SAIL / TISCO / RINL / ESSAR / ARCELOR
Hand Pallet Truck	MAINI / GODREJ / VOLTAS

APPENDIX-III PERFORMCE TEST & UTILITY CONSUMPTION GUARANTEES

Performance test:

The Bidder is required to detail the documentation proposed for performance test of all major items of equipment and all major processes and services plants. This shall detail the guaranteed vs. actual throughput or output or performance (as relevant) and the tolerance of accuracy. Also the test methods proposed to demonstrates that these guarantees have been met.

Formats of Guarantees:

- a) Guarantees for throughput of various sections of plant
- b) Product quality
- c) Weight and measurement tolerance
- d) Milk solid loss
- e) Service consumption

Formats for performance tests:

- a) Procedure for carrying out the tests
- b) Method of measurement
- c) Test durations
- d) Evaluation methodology

PERFORMACE PARAMETERS AND TEST PROCEDURE:

General Test Procedure

The test upon completion of commissioning shall be conducted as per clause 18.4.7 Section VI of this document. On completion of stabilization and commissioning of the plant, the plant will be operated at full capacity to the satisfaction of the OMFED in-charge. This shall be achieved in two stages:

Sectional trials: Total 15 days of sectional trials would be carried out. The break up for each sectional trial will be decided during the trial period.

These tests shall be consecutive and not simultaneous. If shut down occurs for more than one hour, due to external Force Majeure reasons, trials shall be abandoned during that day and repeated.

Plant trials: At completion of the sectional trials the entire plant shall be operated at rated capacity for 15 days of continuous operation. If shut down occurs due to

external Force Majeure reasons after 16 hours of operation in any day, this shall be considered as a full day of testing. If at less than 16 hour of operation, the trials shall be continued for an additional full day.

Process performance and consumption guarantees

1. If the plant or any part thereof does not give the agreed process performance and consumption guarantees during the warranty period due to reasons attribute to the Supplier, the Supplier shall, subject to 2 below, the action shall be as below:

2. Equipment performance: The satisfactory performance for the equipment/processing plant will be considered achieved if the plant operates above 98% of the rated capacity declared by the supplier in the offer.

If performance is between 95% and 98% of the rated capacity, penalty per 1% shall be calculated at 1% of equipment Rs. Value in the contract.

If performance is below 95%, the Bidder will be required to upgrade the plant or replace the plant to comply with the above performance criteria. Otherwise the plant will be deemed unacceptable.

Services requirement: If measured demand of services in the plant is less than 103% of the consumption declared by the Bidder, the buyer will accept that the service requirements has been achieved.

If the requirement of any of the services in the plant is between 103% and 105% of the declared demand, penalty will be charged at 0.33% of Rs. Value of the contract per 1% rise in consumption for each of the services which falls in this category of excessive demand. For the purpose of this calculation, only the main services, steam, power and chilled water will be considered.

If the measured demand for services and energy is above 105%, the Bidder will be required to upgrade the plant or replace the plant to comply with the declared performance criteria. Otherwise the plant will be deemed unacceptable.

PRICE BID (for referenc only)

N:B: The bidder shall submit their offer as per given **BOQ** format provided at online portal <https://tendersodisha.gov.in>

SR.NO.	ITEM DESCRIPTION	CAPACITY	QTY.	UNIT
	PULP UNLOADING AND STORAGE SECTION			
1	Pulp Unloading Lance Station with AOOD Pump	Suitable	1	Set
2	Pulp Storage Tank	3KL	1	No.
3	PIP Type Strainer (DUPLEX)	Suitable	1	Set
4	Pulp Transfer Pump (Positive Displacement Pump)	5KLPH	1	No.
	INGREDIENT DOSING SECTION			
5	Ingrident Dosing Tank with Agitator	500LTR	1	No.
6	PIP Type Strainer (Simplex)	Suitable	2	Set
7	Ingrident Transfer Pump	10 KLPH	1	No.
	SUGAR SYRUP PREPARATION SECTION			
8	Sugar Syrup preparation Tank	4 KL	1	No.
9	THE based Heating system	Suitable	1	Set
10	PIP Type Strainer (DUPLEX)	Suitable	1	Set
11	Sugar Syrup Transfer Pump	5 KLPH	1	No.
12	Plate and Frame Filter Press	5KLPH	1	No.
13	Sugar Syrup Cooler	5 KLPH	1	No.
14	Sugar Syrup Storage Tank	6 KL	1	No.
15	Hot water Recovery Tank	3 KL	1	No.
16	Hot water Transfer Pump	7.5 KLPH	1	No.
17	Sugar Syrup recirculation Pump	5 KLPH	1	No.
18	Sugar syrup Transfer Pump	10 KLPH	1	No.
	COCOA AND PECTIN MIXING SECTION			
19	Cocoa Slurry Prep Tank (Jacketed)	2 KL	1	No.
20	Pectin Slurry Prep Tank	2 KL	1	No.
21	Pectin /Cocoa Slurry Heater/Cooler	10 KLPH	1	No.
22	Pectin /Cocoa Slurry Transfer Pump	10 KLPH	1	No.
23	High Shear Mixer	500kg/hr	1	No.
24	High Shear Mixer outlet Pump	10 KLPH	1	No.
25	PIP Type Strainer (duplex)	10 KLPH	1	SET
26	CIP Return pump Cocoa and Pectin Mixing tanks	Suitable	1	No.
	Curd /RO WATER PASTEURIZER			
27	Curd/RO Water Pasteurizer with Complete Accessories.	5 KLPH	1	SET
28	Pasteurized Ro water Storage Tank	20 KL	1	No.
29	Pasteurized Ro water Transfer Pump	20 KLPH	1	No.
	Blending Section (FM/BM/SL/Juice)			
30	Blending Tanks	15 KL	2	No.
31	Recirculation Pump	25 KLPH	1	No.
32	Shear Pump	25 KLPH	1	No.
33	Heating /Cooling PHE	25 KLPH	1	No.

34	Complete Hot water Generation Module with Complete Accessories for Milk Heating PHE	Suitable	1	SET
35	High Shear Mixer	2000kg/hr	1	No.
36	High Shear Mixer outlet Pump	25 KLPH	1	No.
37	PIP Type Strainer (DUPLEX)	Suitable	1	SET
38	CIP Return pump for Blending Tanks	Suitable	1	No.
39	Product Transfer Pump to UHT Sterilizer	5 KLPH	1	No.
	CIP STATION FOR NON ASPETIC EQUIPMENT CLEAING			
40	Lye tank	3 KL	1	No.
41	Acid tank	3 KL	1	No.
42	Hot water tank	3 KL	1	No.
43	Recuperation tank	4 KL	1	No.
44	flush water tank	3 KL	1	No.
45	Recirculation pump for acid & lye solutions	10 KLPH	2	Nos.
46	CIP Supply pump	25 KLPH	1	No.
47	CIP PHE Heater	25 KLPH	1	No.
48	PIP Duplex filter	25 KLPH	1	No.
	UHT EQUIPMENT			
49	UHT Sterilizer	4400 LPH	1	No.
50	UHT Aseptic Homogenizer with VFD	4400 LPH	1	No.
51	Aseptic Storage Tank	20 KL	1	No.
52	Aseptic Tank CIP System	15 KLPH	1	No.
53	Rinse Milk Recovery Tank	3 KL	1	No.
54	Rinse Recovery Chiller	3 KLPH	1	No.
55	Rinse Milk Transfer Pump	3 KLPH	1	No.
	SS PIPES (MILK / PRODUCT / CIP), FITTINGS & VALVES			
56	SS 304/316 pipes	-----	1	Lot
57	SS Pneumatic Valves (Other Than Mix Proof Valve)	-----	1	Lot
58	SS Fittings & Other Manual valves	-----	1	Lot
59	SS Pneumatic Mix Proof Valves	-----	1	Lot
	UTILITY – PIPES, VALVES, FITTINGS & ACCESSORIES			
60	RO/Soft/Raw Water Pipes, Valves, Fittings & Insulation etc.	-----	1	Lot
61	HP / LP Steam Distribution Piping, Valves, Fittings & Supports, Insulation etc. including PRS	-----	1	Lot
62	Chilled Water Pipes, Valves, Fittings & Insulation etc.	-----	1	Lot

63	Cooling Tower Water Pipes, Valves and Fittings etc.	-----	1	Lot
64	Condensate Recovery System	-----	1	Lot
65	Compressed Air Piping, Valves, Fittings etc.	-----	1	Lot
	ELECTRICAL POWER DISTRIBUTION SYSTEM			
66	Intelligent Motor Control Centre with Capacitor Panel & APFCR Panel	-----	1	Lot
67	Power Cables	-----	1	Lot
68	Control Cables, Instrumentation Cables & Communication Cables	-----	1	Lot
69	Electrical accessories	-----	1	Lot
70	Fire Extinguishers	-----	1	Lot
	AUTOMATION, CONTROLS & INSTRUMENTATION			
71	Automation Software including MIS	-----	1	Set
72	Automation Hardware including PLC Panel, RIOs, RCPs etc.	-----	1	Set
73	Field Instruments including misc. Automation / Instrumentation Items	-----	1	Set
74	Furniture for Control Room with Chairs(Free Issue by Purchase)	-----	1	Lot
75	Automation Accessories	-----	1	Lot
	MISCELLANEOUS			
76	Steam & Water Mixing Battery (Manual)	-----	4	Nos.
77	SS Structure	-----	1	Lot
78	GI /SS Structure	-----	1	Lot
79	Chilled Water Base FCU System for IMCC room (Free Issue By Purchaser)	Suitable	1	Set
80	Three phase UPS - 250 KVA Min	-----	1	Set
81	Spares for one year of Normal Operation (6000hrs)	-----	1	Lot
82	Maintenance tools for steriliser & pre-process equipment	-----	1	Lot
83	Documents / Manuals	-----	1	Lot
84	Training	-----	1	Job
85	Service Cover	-----	4	Job
86	Stand by Operation	-----	2	Job
87	Installation &Comissioning	-	1	Job

APPENDIX IV:**UTILITY CONSUMPTION GUARANTEE & PRODUCT RECOVERY DATA**

STEAM	Peak Load	Kg/hr
	Total Load	Kg/d
	Tolerance (+/-)	%
POWER	Connected Load	Kw
	Peak Load	Kw
	Total Load	Kwh/d
	Tolerance (+/-)	%
WATER	Raw Water Peak	Cum/hr
	Total Water Peak	Cum/d
	Soft Water Peak	Cum/hr
	Total Soft Water	Cum/d
	RO water peak	Cum/hr
	Total RO water	Cum/d
	Tolerance (+/-)	%
COMP. AIR	Peak Load	CFM
	Total Load	CFT/d
	Tolerance (+/-)	%
ICE WATER	Peak Load	Cum/hr
	Total Load	Cum/d
	Tolerance (+/-)	5%

PRODUCT RECOVERY DATA

Losses in Milk	Fat	Kg/d
Handling Milk solids losses	SNF	Kg/d
to effluent	Tolerance (+/-)	%
Details of Consumable	Lye Conc. Acid	Kg/d Kg/d
Materials CIP Chemicals	Conc.	Kg/d
Water Treatment Chemicals	Common Salt	(100%)
	(Commercial)	%
	Tolerance	

SCHEDULE-VI**APPLICATION-TECHNICALBID**

Sl. No.	Details	
1.	Nameof Bidder	
2.	NameofProprietor/Partner/Director alongwithproofasauthorizedperson tosign thedocument&deedetc.	
3.	FullAddress ofRegisteredOffice	
	Contact No.	
	E-mail Address	
4.	Fulladdressof OperatingOffice.	
	Contact No.(1)	
	Contact No.(2)	
	E-mail Address	
5.	Name&telephonenumber.of authorized/person toliaise with Unit(s)	
6.	PAN/ GIRNo. (Attachattestedcopy)	
7.	GSTRegistrationNo. (Attachattestedcopy)	
8.	Performance/ experience (Minimum 3 Year essential) Copyofcertificateenclosed	
9.	Turn Over for the financial year 2023- 2024, 2024-2025& 2025-26	
10.	Income Tax return for the financial year 2023-2024, 2024-2025& 2025-26	
11.	Additional information, if any: (Attach separate sheet if required)	

DECLARATION

1. I, -----Son/ Daughter / Wife of Shri-----
----- Proprietor / Director / authorized
signatory of M/s.-----, mentioned above, am competent to sign
this declaration and execute this tender document;
2. I have carefully read and understood all the terms and conditions of the tender and
undertake to abide by them;
3. The information/documents furnished along with the above application are true and
authentic to the best of my knowledge and belief. I/we, am/are well aware of the fact
that furnishing of any false information/fabricated document would lead to rejection
of my tender at any stage besides liabilities towards prosecution under appropriate
law.

Date:

Place:

Signature of Bidder

Name:

Seal:

Form of Agreement On Non-Judicial Stamp paper of Rs.100/-

THIS AGREEMENT is made and executed on the day of
20 _____

Between the ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., a body corporate under the ORISSA CO-OPERATIVE SOCIETIES ACT and having its registered office at Saheed Nagar, Bhubaneswar - 751007 (herein after referred to as OMFED which expression shall, unless repugnant to the context or meaning thereof, include the successors and assignees of the OMFED) of the ONE PART and _____

(Herein after referred to as the Supplier which expression shall, unless repugnant to the context or meaning thereof, include the heirs, successors, assignees, executors and administrators of the Supplier) of the OTHER PART.

WHEREAS the OMFED is desirous that certain works should be executed, viz

And has by letter of acceptance Dated _____, accepted a bid by the Supplier for the supply of such goods and services, including installation, testing, commissioning and performance trial run & guaranteeing such works, **NOW THIS AGREEMENT WITNESSTH AS FOLLOWS:**

- 1.0 In this agreement, words and expressions shall have the same meanings as are respectively assigned to them in the conditions of Contract herein after referred to.
- 2.0 The following documents shall be deemed to form and be read as construed as part of this agreement, viz
 - i) This Form of Agreement
 - ii) This Letter of Acceptance
 - iii) The said bid, Appendix and the price Schedule Thereof
 - iv) The Technical Specifications
 - v) The Schedule of Quantities
 - vi) The Drawings
 - vii) The Schedule of Supplementary Information
 - viii) Special Conditions of Contract
 - ix) General Conditions of Contract
 - x) Form of Bank Guarantees
- 3.0 The aforesaid documents shall be taken as complementary and mutually explanatory of one, another, but in the case of ambiguities and discrepancies shall take precedence in the order set out above.
- 3.0 In the consideration of the payment to be made by the OMFED to the Supplier as herein after mentioned, the Supplier hereby covenants with the OMFED to execute, complete and maintain the works in conformity in all respects with the provisions of the Contract.

173SignatureofBidder with Seal

*** Thebidder shall not fill up this form.**

- 4.0 The OMFED shall hereby covenants to pay the Supplier in consideration of the execution, completion and guaranteeing of the works the contract price at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused their respective Common seals to be hereunto affix the day, month and year first above written.

Signed, sealed and delivered for And on behalf of the within named OMFED by the hands of its Authorized signatory.

Authorized Signatory

Authorized Signatory

SUPPLIER ORISSA STATE CO-OPERATIVE MILK
PRODUCERS' FEDERATION LTD.

In the presence of:

WITNESS:

WITNESS:

1. Signature
Name and address

1. Sign with Name & Designation

2. Sign with Name & Designation

2. Signature
Name and address

DECLARATION
(Not blacklisted)

Dear Sir,

I / WE hereby declare that I/We are not blacklisted by any Central/ State Government/ agency of Central/ State Government of India or any other country in the world/ Public Sector Undertaking/ any Regulatory Authorities in India or any other country in the world for any kind of fraudulent activities.

(Full Signature of the Supplier)

Date:

Address for Correspondence:

SECTION –VIII

Form of Agreement On Non-Judicial Stamp paper of Rs.100/-

THIS AGREEMENT is made and executed on the day of _____
20_____

Between the ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD., a body corporate under the ORISSA CO-OPERATIVE SOCIETIES ACT and having its registered office at Saheed Nagar, Bhubaneswar - 751007 (herein after referred to as OMFED which expression shall, unless repugnant to the context or meaning thereof, include the successors and assignees of the OMFED) of the ONE PART and _____

(Herein after referred to as the contractor which expression shall, unless repugnant to the context or meaning thereof, include the heirs, successors, assignees, executors and administrators of the contractor) of the OTHER PART.

WHEREAS the OMFED is desirous that certain works should be executed, viz

And has by letter of acceptance Dated _____, accepted a bid by the contractor for the supply of such goods and services, including installation, testing, commissioning and performance trial run & guaranteeing such works, **NOW THIS AGREEMENT WITNESSTH AS FOLLOWS:**

1.0 In this agreement, words and expressions shall have the same meanings as are respectively assigned to them in the conditions of Contract herein after referred to.

2.0 The following documents shall be deemed to form and be read as construed as part of this agreement, viz

- xi) This Form of Agreement
- xii) This Letter of Acceptance
- xiii) The said bid, Appendix and the price Schedule Thereof
- xiv) The Technical Specifications
- xv) The Schedule of Quantities
- xvi) The Drawings
- xvii) The Schedule of Supplementary Information
- xviii) Special Conditions of Contract
- xix) General Conditions of Contract
- xx) Schedule of Materials to be issued by OMFED
- xxi) Form of Bank Guarantees

3.0 The aforesaid documents shall be taken as complementary and mutually explanatory of one, another, but in the case of ambiguities and discrepancies shall take precedence in the order set out above.

176SignatureofBidder with Seal

- 5.0 In the consideration of the payment to be made by the OMFED to the Contractor as herein after mentioned, the Contractor hereby covenants with the OMFED to execute, complete and maintain the works in conformity in all respects with the provisions of the Contract.

*** Thebidder shall not fill up this form.**

- 6.0 The OMFED shall hereby covenants to pay the Contractor in consideration of the execution, completion and guaranteeing of the works the contract price at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused their respective Common seals to be hereunto affix the day, month and year first above written.

Signed, sealed and delivered for
And on behalf of the within
named OMFED by the hands of its
Authorised signatory.

Authorised Signatory

ORISSA STATE CO-OPERATIVE MILK
PRODUCERS' FEDERATION LTD.

In the presence of:

WITNESS:

1) Signature

Name and address

2) Signature

Name and address

Signed, sealed and delivered for

And on behalf of the within

Named Contractor, the other part.

Authorised Signatory

CONTRACTOR

In the presence of:

WITNESS:

1) Signature

Name and address

2) Signature

Name and address

SECTION-IX

ACCEPTABLE FORM OF BANK GUARANTEE

Proforma of Bank Guarantee for Bid Security On Non-Judicial Stamp Paper of Rs.100/-

Bank Guarantee no.

Date:

This deed of guarantee made this _____ day of 20_____ (Two thousand and _____) by (Name and address of the Bank), hereinafter referred to as the Bank, which shall unless repugnant to the context or the meaning thereof includes its legal representatives, successors and assigns and the ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD. (hereinafter referred to as the OMFED) which expression shall be unless repugnant to the context or meaning thereof include its legal representative, successors or assigns.

Whereas the OMFED has invited bids for the supply, installation, testing, commissioning, trial run and guaranteeing of the proposed _____

_____ by the tender notice reference no. _____ .

AND WHEREAS M/S _____

_____ (Name and the address of the bidders) who having submitted their bids (hereinafter referred to as the Tender) and have agreed to deposit to the OMFED an amount indicated in the tender notice as per the terms and conditions of the bidding documents. AND WHEREAS the OMFED is also willing to accept a Bank guarantee in lieu of payment by demand draft of any amount equivalent to the amount of bid security required to be deposited by the bidder to the OMFED which guarantee shall be kept valid for 120 days after the day of the opening of the bids.

In consideration of the OMFED having agreed to consider the bid proposals having submitted by the bidder without depositing the amount of bid security and against this Bank guarantee, we (name and the address of the Bank) hereby undertake and guarantee to make payment to the OMFED the amount of bid security or any part thereof not deposited by the bidder to the OMFED at any time (time being the essence of the Contract) when the OMFED asks for the same as per the terms and conditions of the bidding documents within 120 days from the date of opening of the bids.

The Bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the OMFED in writing and the guarantee shall be continuous and irrevocable guarantee up to a sum of Rs.------(Rupees-----only) provided always that any indulgence or forbearance on the part of the OMFED to the said bidder. With or without the consent of the Bank shall not prejudice or restrict remedies against the bank nor shall the same in any event be a ground of defense by the Bank against the OMFED.

In case the OMFED puts forth a demand in writing on the Bank for the payment of the amount in full or in part against this Bank Guarantee, the Bank will consider that such demand by itself is a conclusive evidence and proof that the bidder has failed in complying with the terms and conditions stipulated by the OMFED in its bidding document and payment will be made to the OMFED without raising any disputes regarding the reasons for such failures on the part of the bidder.

The Bank shall not be discharged or released from this guarantee by any arrangement between the bidder and the OMFED with or without the consent of the Bank or any alternations in the obligations of the parties or by an indulgence, forbearance shown by the OMFED to the bidder.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the OMFED may have or hereafter possess against the bidder and the OMFED shall be under no obligations to marshal in favour of the Bank any such securities or fund or assets that the OMFED at its absolute discretion may vary, exchange, renew, modify or refuse to complete or enforce or assign any security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to the OMFED on OMFED's serving with a notice requiring the payment of the amount and such notice shall be served on the Bank either by actual delivery thereof to the Bank or by dispatching thereof by to the Bank by registered post at the address of the said Bank. Any notice sent to the Bank at its address by registered post shall be deemed to have been duly served on the Bank notwithstanding that the notice may not in fact have been delivered to the Bank.

In order to give full effect to the provisions of this guarantee the Bank thereby waives all rights inconsistent with the above provisions and which the Bank might otherwise as a guarantor be entitled to claim and enforce.

The guarantee shall remain in force until-----and unless the guarantee is renewed or a claim is preferred against the bank within three months from the said date all rights of the OMFED under this guarantee shall cease and the bank shall be released and discharged from all liabilities hereunder.

Notwithstanding anything contained here before, our liability under this guarantee is restricted to Rs. ---
----- (Rupees----- only) being the amount of the Bid security
and it shall remain in force until-----.

Place

Signature

Seal

Code no.

**Note: Bidders should ensure that the seal and code no. of signatory is put by the Bankers,
before submission of the Bank guarantees.**

**Proforma of bank guarantee for Performance security On Non-judicial Stamp
Paper of Rs.60/-**

Bank Guarantee No.

Date:

This deed of guarantee made this _____ day of 20 _____ (Two thousand and _____) by (Name and address of the bank) hereinafter referred to as the bank, which shall unless repugnant to the context or the meaning thereof includes its legal representatives, successors and assigns and the ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD. (hereinafter referred to as the OMFED) which expression shall unless repugnant to the context or meaning thereof includes its legal representatives, successors and assigns .

Whereas the ORISSA STATE MILK CO-OPERATIVE PRODUCERS' FEDERATION LTD. has awarded a _____ contract bearing No. _____ on M/s _____ (Name and the address of the party) hereinafter referred to as the Contractor, for the supply installation, commissioning, completion and the guaranteeing of _____

And whereas the Contractor has agreed to submit a performance security in the form of bank guarantee to the OMFED as per the terms and conditions of the bidding documents. And the contract which will be kept valid upto _____ calendar months from the date of bank guarantees (the period should be till end of period of maintenance) and whereas the bank and its duly constituted agent and officer has already read and understood the contract between the OMFED and the Contractor.

In consideration of the OMFED having agreed to award the contract on the Contractor, we _____ (the bank) do hereby guarantee, undertake, promise and agree with the OMFED , its legal representatives, successors, and assigns that the within named (the name of the Contractor) their legal representatives , assignees will faithfully perform and fulfill everything within the bidding document and the contract order on their part to be performed or fulfilled, at the time (time being the essence of the contract) and in manner therein provided , do all obligations there under and we further undertake and guarantee to make the payment to the OMFED a sum of Rs _____ (Rupees _____ only). Being 10% of the contract value ,in case the Contractor , their legal representatives, assignees do not faithfully perform and fulfill everything within the bidding document and the contract order on their part to be performed or fulfilled, at the time and in manner therein provided and do not willfully and promptly do all obligations there under. In case the Contractor fails to perform or fulfill the contract as per the terms and conditions agreed upon, the OMFED is entitled to demand an amount equivalent to 10% of the contract value from the Contractor and the demand made by the OMFED itself will be conclusive evidence and proof that the Contractor has failed to perform or

183 Signature of Bidder with Seal

fulfill his obligations under the contract and neither the Contractor nor the bank shall be entitled to raise any dispute regarding the reasons for the failure of performance or fulfillment on any ground whatsoever.

We, (the name of the bank), do hereby undertake to pay an amount equivalent to 10% of the contract value, being the amount due and payable under this guarantee. Without any demur, merely on a demand from OMFED stating that the amount claimed is due by way of Non-performance of the contractual obligations as aforesaid by the contractor or by the reason of the contractor's failure to perform the said contractual commitments, any such demand made on the banks shall be conclusive as regards the amount due and payable by the bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only being the amount equal to 10% of the contract value.

We, the bank further agree that the performance security herein contained shall remain in full force and effect for a period of _____ calendar months from the date of the bank guarantee. (the period shall be till the end of period of maintenance) whichever is later or till the OMFED certifies that the terms and conditions of the said contract have been fully and properly carried out by the said Contractor and accordingly discharge the guarantee, unless a demand or a claim under this guarantee is made on us in writing by the OMFED on or before _____ (the date shall be 90 days after the end of the period of maintenance) we shall be discharged from all liabilities under this performance security hereafter.

We, the bank, further agree with the OMFED that the OMFED shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of bidding document and the contract or to extend the time of performance by the said Contractor from time to time and any of the power exercisable by the OMFED against the Contractor and forbear or enforce any of the terms and conditions relating to the said bidding document and the contract and we shall not be relieved from or liability by reason of any such variation, or extension being granted to the said contractor or for any forbearance, act or omission on the part of the OMFED to the said Contractor by any such matter or thing whatsoever which under the law relating to the sureties would but for this provision have effect of so relieving us. This guarantee shall be in addition to and without prejudice to any other securities or remedies which the OMFED may have or hereafter possess in respect of the works executed or intended to be executed and the OMFED shall be under no obligation to marshal in favour of the bank any such securities or funds or asset that the OMFED may be entitled to receive or have a claim upon and the OMFED at its absolute discretion may vary, exchange, renew, modify or refuse to complete or enforce or assign any security or instrument.

The bank agrees that the amount hereby guaranteed shall be due and payable to the OMFED on serving us with a notice, requiring the payment of the amount and such notice shall be deemed to have been served on the bank either by actual delivery thereof to the bank or by dispatch thereof to the bank by registered post at the address of the bank.

Any notice sent to the bank at its address by registered post shall be deemed to have been duly served on the bank notwithstanding that the notice may not in fact have been delivered to the bank.

In order to give full effects to the provisions of this guarantee the bank hereby waives all rights inconsistent with the above Rs. _____ (Rupees _____ Only). The guarantee shall remain in force until _____ and unless the guarantee is renewed or a claim is preferred against the bank within three months from the said date (the date of expiry) all rights of the OMFED under the guarantee shall cease and the bank shall be released and discharged from all liabilities hereunder.

Place

Signature

Date

Seal

Code no.

Note:

The Contractor should ensure that seal and the code no. of the signatory is put by the bankers, before submission of the bank guarantees.

Proforma of Bank guarantee for advance payments
On Non judicial stamp paper of Rs 40/-

In consideration of the ORISSA STATE CO-OP. MILK PRODUCERS' FEDN. LTD. (hereinafter called "the OMFED") having regard to grant advance of Rs. _____

(Rupees _____) to M/s _____

Having their office at _____

Hereinafter called "the said contractor") under the terms and conditions of the purchase Order No. _____ Dated _____ made between the OMFED and M/S. _____

for supply, installation, commissioning, trial-running and guaranteeing of _____

(Hereinafter called the " the order") on production of bank guarantee for Rs. _____

185 Signature of Bidder with Seal

(Rupees _____ only), We (the bank) do hereby undertake to pay the OMFED an amount not exceeding Rs. _____ (Rupees _____ only) against any loss/damage caused to or suffered by the OMFED by reason of any breach by the said contractor of any of the conditions contained in the order.

We, (the bank), do hereby undertake to pay the amounts due and payable under this guarantee without any demur merely on a demand from the OMFED stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the OMFED by reasons of any breach by the said contractor of any of the terms and conditions contained in the order or by reasons of the contractor's failure to perform the said order. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this guarantee and shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only).

We, _____ (the bank), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said order and that it shall be continue to be enforceable till all the dues of the OMFED, under, or by virtue of the said order have been fully paid and it's claims satisfied or discharged or till OMFED certifies that the terms and conditions of the said order have been fully and properly carried by the said contractor and accordingly discharge the guarantee and unless a demand or a claim under this guarantee is made on us in writing on or before _____, we shall be discharged from all liabilities under this guarantee thereafter.

We, _____ (the Bank), further agree with the OMFED that the OMFED shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary in any of the terms and conditions of the said order, to extend the time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the power exercisable by the OMFED against the said Contractor and to forbear or enforce any of the terms and conditions relating to the said order and we shall not be relieved from our liability by reason of any such variation, or extension or for any forbearance, act of omission on the part of the OMFED or any indulgence by the OMFED to the said Contractor or any such matter or thing whatsoever Which under the law relating to the sureties would but for this provision have effect of so relieving us.

We, _____ (the bank), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the OMFED in writing.

Notwithstanding anything stated herein above the liability of the bank Guarantee is restricted to Rs. _____ (Rupees _____ Only). The guarantee shall remain in force till the _____ and unless the guarantee is renewed or a claim is preferred against the bank within three months from the said date all rights of the OMFED under the guarantee

shall cease and the bank shall cease and the bank shall be released and discharged from the liabilities hereunder.

Place

Signature

Date

Seal

Code no.

Note

Note: Contractor should ensure that seal and code no. of the signatory is put by the bankers, before the submission of the bank guarantees.

SECTION --X (1)

MANUFACTURER'S AUTHORIZATION FORM

No. _____ Dated _____

To

Orissa State Co-op. Milk Producers Federation. Ltd.

D-2, Saheed Nagar

Bhubaneswar-751001

ORISSA, INDIA

Dear Sir,

Sub: Tender Ref. No. _____

We _____ an established and reputable manufacturers of _____ having factories at _____ and _____ do hereby authorize M/s _____ (Name and address of agents) to bid, negotiate and conclude the contract with you against Tender notice Ref. No. _____ for the above goods manufactured by us.

No company or firm or individual other than M/s _____,

located at _____ are authorized to bid, negotiate and conclude the contract in regard to this business against this specific Tender Notice.

We hereby extend our full guarantee and warranty as per the General conditions of contract for the goods offered for supply against this Tender notice by the above firm.

Yours faithfully,

(NAME)

For and on behalf of M/s.

(Name of Manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturing concern and should be signed by a person competent and having the power of attorney to bind the manufacturer.

SECTION-X (2)
MANUFACTURER'S AUTHORIZATION FORM

(Please see Clause 14.3 of instructions to bidders)

No. _____ Dated _____

To

Orissa State Co-op. Milk Producers' Federation. Ltd.

D-2, Saheed Nagar

Bhubaneswar-751007

ORISSA

Dear Sir,

Sub: Tender Ref.No. _____

We _____ an established and
reputable manufacturers of _____ having factories at
_____ and _____

do hereby authorize M/s _____ (Name and address of
agents) to bid, negotiate and conclude the contract with you against bid
no. _____ for the above goods manufactured by us.

No company or firm or individual other than M/s _____

are authorized to bid, negotiate and conclude the contract in regard to this business against this
specific IFB.

We hereby extend our full guarantee and warranty as per Clause 81 of the general conditions of
contract for the goods offered for supply against this invitation for bid by the above firm.

Yours faithfully,

190SignatureofBidder with Seal

(NAME)

For and on behalf of M/s

(Name of manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturing concern and should be signed by a person competent and having the power of attorney to bind the manufacturer.

SECTION - XI

TECHNICAL DEVIATION STATEMENT FORM

The following are the particulars of deviations from the requirements of the tender specifications.

CLAUSE	DEVIATION	REMARKS
		(Including justification)

Dated- _____ Signature and seal of the
Manufacturer / Bidder

Note:

- (1) Where there is no deviation, the statement should be returned duly signed with an endorsement indicating "No Deviations".
- (2) The technical specifications furnished in the bidding document shall prevail over those of any other document forming a part of our bid, except only to the extent of deviations furnished in the statement.

SECTION - XII

POINTS BIDDERS SHOULD BEAR IN MIND

- I. BIDS CONTAINING DEVIATIONS FROM BIDDING DOCUMENT TERMS AND OTHER CONDITIONS MAY BE REJECTED.
- II. BIDS NOT ACCOMPANIED BY BID SECURITY (EARNEST MONEY DEPOSIT) SHALL BE SUMMARILY REJECTED.
- III. NON-COMPLIANCE WITH EVEN A MINOR TECHNICAL REQUIREMENT SHOULD BE SPECIFICALLY STATED BY THE BIDDERS.
- IV. BIDDERS SHOULD FURNISH THEIR COMPLETE ADDRESS FOR THE PURPOSE OF FURTHER CORRESPONDENCE PERTAINING TO BIDDING DOCUMENT.
- V. CORRECTIONS IN THE BID SHOULD BE NOTED OVER AND INITIALED AT THE PLACE OF CORRECTIONS.
- VI. NEGLIGENCE OF THE BIDDER IN PREPARING THE BID CONFERS NO RIGHT TO WITHDRAW THE BID AFTER IT WAS OPENED.
- VII. SPECIFICATIONS, CONDITIONS, SCHEDULES AND DRAWINGS OF BIDDING DOCUMENT CONSTITUTE AN INTEGRAL PART OF THE BID.
- VIII. ALL THE BIDS ALONGWITH ENCLOSURES, DRAWINGS AND TECHNICAL LITERATURE SHOULD BE IN ENGLISH ONLY.
- IX. BIDDING DOCUMENT SHALL BE GOVERNED AND INTERPRETED ACCORDING TO THE SYSTEM AND COMPONENTS UNDER TROPICAL CONDITIONS.
- X. ALL THE BIDDERS SHOULD SUBMIT QUALIFICATION APPLICATION IN THE GIVEN FORMATS WITH REQUIRED DOCUMENTATION.
- XI. BIDS SHOULD BE KEPT VALID FOR ACCEPTANCE FOR A PERIOD OF ONE YEAR FROM THE DAY BIDS ARE OPENED.
- XII. THE BIDDING DOCUMENT SHALL BE GOVERNED AND INTERPRETED ACCORDING TO THE LAWS OF THE UNION OF INDIA.
- XIII. ALL BIDDERS ARE URGED TO SUBMIT PROMPTLY WRITTEN REQUESTS ON MATTERS WHERE CLARIFICATIONS OR ADDITIONAL INFORMATION ARE DESIRED, NOT LATER THAN SEVEN DAYS BEFORE BIDS ARE DUE TO OPENING. NO EXTENSION IN DUE DATE OF SUBMISSION OF BIDS WILL BE ALLOWED ON THIS GROUND.
- XIV. ALL THE BIDDERS SHOULD QUOTE FOR THE ITEMS AS PER THE SPECIFICATIONS AND DETAILS GIVEN IN THIS BIDDING DOCUMENT ONLY. IN CASE, ALTERNATIVE DESIGNS ETC. ARE TO BE OFFERED BY THE BIDDERS, THEY MAY DO SO BUT THIS SHOULD BE STATED SEPARATELY IN THE OFFER. ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LIMITED RESERVES ITS RIGHT TO ACCEPT OR REJECT SUCH ALTERNATIVE OFFERS, WITHOUT ASSIGNING ANY REASONS THEREOF TO THE BIDDERS.
- XV. THE BIDDERS WHO QUOTE FOR SUPERVISION AND COMMISSIONING OF ANY EQUIPMENT SHOULD ALSO INDICATE THE PRICES IN THE BID SEPARATELY. THE SUPERVISION OF COMMISSIONING WOULD INCLUDE CHECKING THE INSTALLATION AND COMMISSIONING THE PLANT TO GIVE THE RATED OUTPUT.
- XVI. MANAGING DIRECTOR, ORISSA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD. RESERVES THE RIGHT TO ACCEPT OR REJECT ANY OR ALL BIDS WITHOUT ANY EXPLANATION TO BIDDERS.
