CONTENTS

00	04.03.16	Fresh Issue	E.KRITHIGA	C.SARAVANAN	R.PRABHA
Rev	Date	Alteration	Prepared	Checked	Approved

1.0 INTENT OF SPECIFICATION

1.1 This specification is intended to cover the design, manufacture, inspection/testing at manufacturer's works, properly packed for delivery of end suction pumps and drives complete with accessories.

The bidder shall include all supplies in his scope, part supplies offered shall disqualify the offer.

2.0 SCOPE OF SUPPLY & SERVICES

2.1 The single stage, centrifugal, end suction pump and drive covered under this specification are as under. The capacity, Head, Materials of construction and other particulars of these pumps are detailed in Data Sheet-A

2.2 **Accessories**

All the pumps under this specification shall be complete with following standard/special accessories.

2.3 **Standard accessories**

a) LT Electric drives/motors
b) Pump motor coupling along with coupling guard
c) Common base plate for pump and motor
d) Self contained lubrication system along with all internal piping, valves, fittings, specialties etc. as required.
e) Suction discharge expanders/reducers as applicable
f) Counter flanges for suction/discharge nozzles along with fixing nuts, bolts and gaskets.
g) Anchor bolts, nuts, seating steel works etc. as necessary for mounting the pump-motor unit on civil foundations.
h) Suitable vent (with valves)/ lifting/ handling attachments for the pump/ motor/accessories.
i) Suitable drain connections with isolating valves as applicable.
j) Supply of first fill of lubricants with toping requirements for one year of operation after commissioning and handing over of equipment.
k) Set of "Special" Tools &Tackles for Pumps and motors if any.
l) Erection and commissioning spares "on as required" basis.
m) Bidder shall provide various drawings, data calculations, test reports/ Certificates, operation and maintenance manuals, As-built drawings etc. as specified and as necessary.

3.0 SPECIFIC TECHNICAL REQUIREMENT

3.1 The pumps shall meet the technical requirements specified in Data Sheet-A

3.2 The pumps shall be Electric motor driven.

The pumps shall conform to HIS

Following shall be applicable to all the pumps.

- No negative tolerance shall be permitted in rated capacity & TDH
- No negative tolerance shall be permitted in efficiency at rated Capacity.
- The shut off head of pumps shall be at least 115% of pump rated TDH.

3.3 The pumps shall be capable of developing the required total head at rated Capacity for continuous operation. The pumps shall operate satisfactorily at any point on the Q-H characteristic curve over a range of 0% to 130% capacity and shall be suitable for continuous operation between 30% to 130% capacity.

3.4 Selection of the pumps shall be such that the design point shall be met even with negative manufacturing tolerance.

3.5 The total head capacity curve shall be continuously rising towards the shut off, the pumps shall preferably be non-overloading type and stable.

3.6 The pumps shall be capable of running over the entire range of NPSH conditions required without any noise, vibration or cavitation. The prevailing suction pressures for various pumps are indicated in Data Sheet-A for suitable mechanical design of pumps.

3.7 Motor Ratings:
As per electrical specification ie. the drive motor shall have at least 15% margin over the maximum power requirement of the driven equipment after considering all losses, derating due to temperature and specific site and operating conditions.

3.8 The pumps shall be of stiff shaft design. The minimum internal clearances should be sufficiently more than the max. static deflection of the shaft. Shaft size selected must take into consideration the critical speed as specified in API-610.

3.9 Pumps and motors shall run smooth without undue noise and vibration. The vibration shall be within 75 microns for pump – motor set. The noise level shall be limited to 85 dB at distance of 1.0M.

3.10 Pumps of a particular category shall be identical and shall be suitable for parallel operation with equal load division. Components of identical pumps shall be Interchangeable

3.11 After installation, the guaranteed values of noise, vibration and parallel operation of pumps shall be demonstrated by the bidder. If the site performance is found not meeting the requirements in any respect as specified, then the equipment shall be rectified or replaced by the vendor, at his own cost.

3.12 High reliability of the pumps is an essential requirement and therefore it gets weightage over its efficiency. It is therefore essential that the bidder chooses a standard proven model from the range of pumps manufactured. The offered pumps shall be of proven design meeting the experience-qualifying requirement of their operation at two sites for a minimum period of two years as in June 2008. Any deviation to this criteria shall be suitably highlighted in the deviations schedule.

3.13 The bearings shall be self water lubricated, no external water supply shall be available. The cooling/lubrication water for bearings etc. shall be tapped from the pump discharge and supplied thru' bidder's integral pipe work.

4.0 QUALITY PLAN

As per applicable QP.

5.0 DRAWINGS, DATA, CURVES AND INFORMATION

5.1 The bidder shall submit the following along with the offer.

5.2 **Drawings, data & curves**

a) General arrangement drawings showing the principal dimensions, weight and location of the suction and discharge connections of the pumps offered. Details of lubrication and sealing arrangement shall be included.

b) Typical cross-section drawing showing various components of the pump offered, materials of construction etc.

c) Anticipated performance curves showing the following characteristics

- Capacity Vs head
- Capacity Vs power
- Capacity Vs efficiency
- Capacity Vs NPSH regd.

d) General arrangement drawing of control panel.

e) Speed Vs torque curve of the pump corresponding to recommended mode of pump starting superimposed on speed Vs torque curves of the drive unit corresponding to 80%, 90% and 100% of rated voltage (applicable only for pumps with motor ratings greater than 100 Kw).

f) Complete technical particulars of the pump as per the data sheet enclosed.

5.3 The successful Bidder shall furnish the following drawings/data for Purchaser/Engineer's approval after award of the contract..

5.4 Final versions of all the drawings, documents as specified in clauseno.5.2.

5.5 Pump foundation details along with all design loads, direction and points of application.

5.6 Test reports, test certificate and other particulars.

5.7 All other applicable drawings and documents as specified and deemed necessary.