

**TENDER FOR
SUPPLY, INSTALLATION AND COMMISSIONING OF
EQUIPMENT FOR
CIRCULATING WATER CHANNEL
ON TURNKEY BASIS**

**TENDER NO: IMUV/2013-2014/RP008/003
Dated 28th December 2013**

**INDIAN MARITIME UNIVERSITY
VISAKHAPATNAM CAMPUS
GANDHIGRAM
VISAKHAPATNAM - 530005
ANDHRA PRADESH**

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SECTION 1
NOTICE INVITING TENDER

- 1.1 Indian Maritime University, Visakhapatnam Campus invites Sealed tenders for **“Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey Basis”**
- 1.2 The Cost of Tender document is 500-00 (Rupees Five Hundred Only) payable by way of Demand Draft drawn on any Nationalized/Scheduled Bank in favour of Indian Maritime University, Visakhapatnam Campus Payable at Visakhapatnam. The tender document can also be downloaded from the web site www.nsdr.com. In such case the cost of tender document shall be submitted along with the Tender
- 1.3 Tenderers are advised to study the Tender Document (including all Sections, Schedules and Annexure(s) etc) carefully. Submission of Tender shall deem to have been done after careful study and examination of the Tender Document with full understanding of its implications.
- 1.4 Sealed tender prepared in accordance with the conditions enumerated in **Section-3** should be submitted to the Director, Indian Maritime University, Visakhapatnam Campus, Gandhigram, Visakhapatnam 530005, not later than the date and time mentioned, at the address given in this section.
- 1.5 All tenders must be accompanied by an Earnest Money Deposit (EMD) of **Rs.8000-00 (Rupees Eight Thousand only)**
- 1.6 This Tender Document is not transferable.
- 1.7 Schedule for Invitation to Tender
- a) **Name of the Purchaser**
- Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh
Phone: 0891-2578360-64
Fax : 0891-2577754
- b) **Location where the Equipment to be supplied, Installed and Commissioned**
- Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh

c) **Addressee and Address at which Tenders are to be submitted**

Director
Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh

d) **Date from which the Tender document is issued**

From **28th December 2013** onwards on all working days till the due date of submission of the sealed tender.

e) **Place of issue of Tender document**

Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh

f) **Last Date for submission of the Tender**

On or before 1500 Hours on 22nd January 2014

g) **Place of submission of Tender (Technical and Price Bid)**

Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh

h) **Date of opening of Technical Bid**

At 1600 Hours on 22nd January 2014

i) **Place of opening of Technical Bid**

Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh, India

j) **Validity of Tender**

90 days from the date of opening of the Technical Bid.

k) The date of opening of price bid will be intimated after technical evaluation of the tenders.

l) **Date by which the supply and installation to be completed**

Within Eight (8) weeks from the date of placement of Order

1.8 **Pre-bid Meeting**

A Pre-bid Meeting will be held on 8th January 2014 at 1000 Hrs at the following address:

Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh

1.9 Clarifications on the specifications, tender conditions etc, if any, will be clarified till submission of the tender. Any queries thereafter will be summarily rejected.

SECTION 2 **DEFINITIONS**

- 2.1 Tenderer: Refers to the Person or the Firm or the Company to whom this Tender is issued.
- 2.2 Vendor: Refers to the person or the firm or the Company with whom the order for the Supply, Installation and Commissioning of the Equipment is placed and shall be deemed to include the Vendor's successors, their representatives (approved by the Purchaser), heirs, executors, administrators and permitted assigns, as the case may be, unless excluded by the terms of the Contract. Also referred to as the successful Tenderer.
- 2.3 Purchaser: Refers to IMU, Visakhapatnam Campus
- 2.4 The Consignee of all the items shall be IMU, Visakhapatnam Campus
- 2.5 IMUV: Refers to Indian Maritime University, Visakhapatnam Campus.
- 2.6 Goods: Refers to all equipment, other accessories, which the successful Tenderer is required to supply to IMUV under the Contract as indicated in this Tender.
- 2.7 Services: Refers to various Services indicated in this Tender and shall include services ancillary to the supply of the Goods, transportation, insurance and any other incidental services, such as installation, warranty, maintenance for one year. Service as specified in this tender including the provision of technical assistance for integration of the supplied items and training and any other such obligations of the Tenderer as covered under the tender.
- 2.8 Items: Refers to all Goods and Services indicated in this Tender and shall include all accessories which are essential to meet the requirements specified.
- 2.9 Start Date: Refers the date on which the order is placed on the successful tenderer and accepted by the successful tenderer.
- 2.10 Acceptance/Completion Date: Refers to the date on which all the items along with accessories (as specified in the tender) are supplied and installed and Commissioned and acceptance of the Equipment by IMUV.
- 2.11 The warranty period: For all supplied items the Comprehensive warranty shall be available from date of successful commissioning of the Equipment.
- 2.12 RST, RSP : RST refers to Respons Sheet Technical (RST) and RSP refers to Response Sheet Price (RSP)

SECTION - 3
GENERAL CONDITIONS AND DIRECTIONS
FOR THE GUIDANCE OF TENDERER

- 3.1 Tenders in sealed cover should be submitted as per the 'Schedule of Requirements' as indicated in **Section-6** in this tender and in accordance with instructions to Tenderers i.e. as per general conditions and directions for the guidance of Tenderer are to be submitted in duplicate to The Director, Indian Maritime University, Visakhapatnam Campus, Visakhapatnam .
- 3.2 Tender must be submitted in one sealed main cover containing Cover I and II separately and the main cover shall be super scribed as Tender for **“Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey Basis”**. All the covers shall be addressed to the Director, Indian Maritime University, Visakhapatnam Campus, Visakhapatnam-530005. Name and address of the Tenderer shall also be written on all covers.
- 3.3 The Tenderer shall clearly write on **Cover - I** as **“Technical Bid - “Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey Basis”** and on **Cover - II** as **“Price Bid-“Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey Basis”**.
- 3.4 The contents of Technical bid are specified in **Annexure-1** and contents of Price bid are specified in **Annexure-2**
- 3.5 All the contents of **Cover- I** shall be submitted in duplicate; and in **Cover-II** only one price bid shall be submitted.
- 3.6 On the date of opening of technical bid, only the Main Cover and **Cover-I** (Technical Bid) alone will be opened. **Cover-II** of various Tenderers will be put in a sealed cover in the presence of the Tenderers or their authorized representatives, who are present on the date of opening of Technical bid.
- 3.7 The price information should only be furnished in Price Bid (Cover II).
- 3.8 Tender documents are not transferable.
- 3.9 The Tenderer shall offer and quote for all items and services indicated in the Tender. Tender responses that do not cover all items shall be summarily rejected.
- 3.10 The Tenderer should enclose in the technical bid, full details of the items offered with full documentation, descriptive literature/leaflets supplementing the description to meet the specification as indicated in the tender. Models and Brands offered shall be clearly indicated including all accessories. All documentation required is to be in English Language. The Tenderer shall clearly indicate OEM part/identification numbers for all the equipment and services supplied inclusive of warranty in technical response sheet **(RST- 07)**.

- 3.11 The Tender should be complete in all respects and if the Tender is incomplete the same may be rejected.
- 3.12 The Tenderer shall sign and affix stamp on all pages of the tender documents and a person, holding a power of attorney authorizing him to do so, shall make such signature. The letter of authorization is to be enclosed along with the covering letter of the technical and price bids.
- 3.13 The Tenderer shall offer the items specified in the Tender document, as the sole agency.
- 3.14 Amendment to Tender Document
- 3.14.1 At any time prior to the last date for receipt of the bids, IMUV, may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Tenderer, modify the Tender Document by an amendment.
- 3.14.2 The amendment will be notified by Post or Fax or E-mail to all the Tenderers who have received the Tender Document and will be binding on them. An amendment notice sent by Fax or a signed confirmation copy through Post will follow E-mail.
- 3.14.3 In order to afford prospective Tenderers, reasonable time in which to take the amendment into account in preparing their bids, IMUV may or at its own discretion, extend the last date for receipt of bids.
- 3.15 The amount of Earnest Money Deposit (EMD) is **Rs.8000-00 (Rupees Eight Thousand only)** and shall deposit in the form of Demand Draft drawn on any Nationalized/Scheduled Bank in favour of Indian Maritime University, Visakhapatnam Campus payable at Visakhapatnam. The Demand Draft should be enclosed to the Technical Bid and should not be sent separately. The Micro and Small Enterprises (MSEs) registered with National Small Industries Corporation (NSIC) are exempted from payment of EMD subject to submission of valid NSIC registration certificate along with the bid.
- 3.16 The EMD by the unsuccessful Tenderer will be refunded without any interest on placement of Order on the successful Tenderer. The EMD for the successful Tenderer shall be refunded on submission of Security Deposit equivalent to 10% of the order value (final accepted tender value) in the form of Bank Guarantee.
- 3.17 All the taxes and duties, etc., applicable shall be indicated clearly in price bid. The offers that contain the prices in the technical bid will be invalid and such Tenders will be summarily rejected.
- 3.18 The prices quoted should be on Indian Rupee basis and should include the base price (inclusive of freight, forwarding, Insurance coverage till acceptance and delivery at IMUV), installation and testing along with applicable taxes and duties. The taxes and duties, if any, shall be indicated clearly in the Tender and the same shall be taken into

account to arrive at the total price for delivery at IMUV at Visakhapatnam. IMUV does not bind itself to accept claims for extra payment for items not included in the Tender. Any revision in Statutory levies during the period between placement of Order and successful commissioning of the equipment would be paid by IMUV on receiving documentary evidence for such revisions against the information furnished in the Tender.

- 3.19 The Tenderer shall abide by the specifications and terms and conditions as mentioned in this tender.
- 3.20 The successful Tenderer on receipt of the Order shall furnish Security Deposit for 10% of the total value of the order (Final accepted tender value) by way of unconditional irrevocable Bank Guarantee from a Nationalized/Scheduled Bank in the form hereto annexed (**Annexure-3**) within 7(Seven) days from the date of issue of the Order, failing which the Order may be cancelled. Under such event the purchaser shall have the right to procure the items at his discretion. On receipt and acceptance of the Bank Guarantee by IMUV, Earnest Money Deposit submitted with the Tender will be refunded. No interest will be allowed on the Earnest Money Deposit from the date of its receipt until it is refunded. The MSEs registered with NSIC are exempted from payment of Security Deposit up to their monetary limit as specified in their NSIC certificate
- 3.21 EMD of the Tenderer would be forfeited if -
- a) The tenderer is not willing to abide by the terms of conditions after submission of tender.
 - b) The tenderer does not honour the clarifications provided to IMUV.
 - c) Withdraws or amends or impairs or derogates from the tender in any respect within the period of validity of its tender before receipt of final acceptance.
 - d) Fails to submit Bank Guarantee as indicated in this tender within the stipulated time. (This is applicable to tenderer whose tender has been accepted)
- 3.22 Tenders will be opened on the day and time as indicated in this document. Eligible Tenderers as above should send letter of authorization with attested specimen signatures of their representatives who are deputed to attend at the time of opening of Tenders. Representative without such authorization letters may not be permitted to be present to witness the opening. (Only one person is authorized to attend on behalf of each Tenderer for Bid Opening).
- 3.23 Offers received through Telegraphic/Fax/E-Mail will be treated as defective, invalid and rejected.
- 3.24 The Specifications of equipment to be supplied refer to the minimum requirements that the Tenderer is required to meet. Tenders in non-compliance of the minimum specifications would be summarily rejected. The tenderer is required to quote for any accessories etc., which are required to make the Equipment fully operational and functional.

3.25 Only detailed complete offers received prior to closing time and date of the Tenders will be taken as valid.

3.26 Eligibility Criteria for Tenderers

3.26.1 The Tenderer shall be capable of meeting the schedule of requirements.

3.26.2 The Tenderer shall be the Original Equipment Manufacturer (OEM) / their authorized / certified partner or authorized reseller. He shall furnish necessary authorization from the OEM and authorizing him to provide all goods and services support indicated in this tender and confirming that necessary assistance would be provided to him in providing required support during the Warranty Period (**RST- 02**)

3.26.3 The Tenderer shall have demonstrated capability of Supply, installation and Commissioning of equipment for Circulating Water Channel as indicated in the Tender. **The scope of such executed Supply / Works should include supply, installation and Commissioning of the Equipment and its accessories.** Each of the above Supply/Works should have been awarded in one Comprehensive Order. The Tenderer shall provide necessary information in support of this along with a testimonial for each of such Orders, from the respective Clients, duly certifying the Supply/ Work executed and satisfactory completion as per respective orders (**RST- 03**).

3.26.4 The Tenderer should have a turnover of Rs. 20.00 Lakhs for the last three years. The annual reports including audited reports shall be enclosed with the technical bid of the tender.

3.26.4 The Tenderer shall be operating in the field of sales and Service of similar items. He shall have an office with sufficient service engineers trained to provide support services. The Tenderer shall also have sufficient spares on hand for providing the uptime as indicated in this tender (**RST- 04**).

3.26.5 The tenderer should quote all the items of the same OEM.

3.27 Methodology: (RST- 05)

3.27.1 The Tenderer shall furnish a clear methodology in meeting various requirements of this tender including -

- Supply of equipment for Circulating Water Channel
- Installation
- Acceptance and Testing
- Comprehensive Warranty support

3.28 **Placement of Order:**

- 3.28.1 After evaluation and finalization of bids received, IMUV would place the Order on the successful Tenderer. The tender will be awarded to the tenderer who is technically qualified and whose value is the lowest.
- 3.28.2 The date on which the order is placed on the successful tenderer and accepted and accepted by the successful tenderer would be treated as the start date. Prior to issue of the Order, IMUV reserves the right to include/modify/exclude specific terms and conditions of Tender.
- 3.28.3 The successful tenderer is required to submit a Bank Guarantee within stipulated period as per the pro-forma attached in **Annexure - 3**, for 10% of the Order value (Final accepted value) towards Security Deposit / Performance guarantee. The Bank Guarantee should remain valid for a period of 60 days beyond the date of completion of all obligation of the Supplier, including warranty obligations.
- 3.28.4 IMUV reserves right to modify the terms and conditions to the Order, so as to meet contingency situations, which can arise from time to time. Such modifications would be discussed and agreed upon by the successful Tenderer taking into consideration the cost, time and other implications. After finalization of modification, the Order may be suitably amended, if required.
- 3.28.5 IMUV reserves right to change quantities or withdraw some of the items from bill of materials before issuing the order.
- 3.29 IMUV reserves the right to amend any of the requirements, terms and conditions of this Tender.

3.30 **Terms of Payment**

- 3.30.1 50% of value after delivery at site and inspection.
- 3.30.2 Balance after Installation, Testing and Acceptance.

SECTION - 4
SPECIAL CONDITIONS OF TENDER

- 4.1 Successful Tenderer shall be responsible for the insurance, safe delivery, installation and commissioning of the goods at IMUV. The successful Tenderer is responsible for all the supplies of goods and services till the acceptance date after which the ownership is transferred to IMUV.
- 4.2 In the event of the placement of the Order, the consignment shall be booked in the name of Indian Maritime University, Visakhapatnam Campus, Visakhapatnam-530005. Any demurrage charges that may become payable on account of the Successful Tenderers failure to consign the materials duly, shall be to the successful Tenderer Account.
- 4.3 The prices offered for the goods and services offered, except for any statutory duties and levies, shall be firm and not subject to any variation at any stage till the completion of the contract in all respects. This must be clearly stated in the covering letter for Technical and price bids.
- 4.4 The time of delivery is important and must be clearly stated in the Tender and strictly adhered to in the event of a tender being awarded. The delivery time would commence from the start date.
- 4.5 In case of delay in the supply, IMUV shall issue to the successful Tenderer; a memo in writing, pointing out the delay in the supply and calling upon the successful Tenderer to explain the cause for the delay within 3 days of the receipt of the memo.
- 4.6 If IMUV is not satisfied with the explanation offered, the successful Tenderers security deposit may be forfeited and or IMUV may withhold payment of pending bills in whole or in part. If the security deposit or any part thereof is forfeited by an order of IMUV and such order becomes final, the successful Tenderer shall make good the security deposit or part of such deposit so forfeited within a fortnight thereafter.
- 4.7 If the successful tenderer fails to execute the Supply/Works in all respects within the period specified or within such extended period as may be allowed, the successful tenderer shall pay a sum equivalent to 1% of the value of the total tender price per week (Seven days) or part thereof subject to a maximum limit of 10% of the value of the each of the item tender as liquidated and ascertained damages.
- 4.8 The supply shall be subject to inspection by IMUV and IMUV's decision as to the acceptance or rejection of any goods as not conforming to specification, shall be final and binding on the successful tenderer. Such of the goods which are rejected shall be removed by the successful tenderer their own expense and replaced by fresh ones within a reasonable time.
- 4.9 Bank guarantee will be returned only after successful completion of warranty period of one year from the date of acceptance of the equipment.

- 4.10 It must be clearly understood that the prices quoted in the tender are to include everything required to be done as per the specification and the conditions of tender and supply for the proper execution of supply/works although special mention thereof may have been omitted in the specification. The specifications indicated are for maximum and shall include accessories etc required to make the system fully operational.
- 4.11 The purchaser has the right to change/ withdraw the quantities of any items in the tender prior to signing of contract. The successful tenderer shall agree to supply the additional quantities for the same price and comprehensive warranty in the event the purchaser places a repeat order for some of the items within next six months.

SECTION - 5
OTHER GENERAL CONDITIONS

- 5.1 The Goods/Services to be supplied by the tenderer shall be of the quality or sort specified and in every respect equal and answerable to the specifications sent with the tender and shall be subject to the approval of the IMUV.
- 5.2 The Goods/Services are to be delivered at specified place in IMUV premises in Visakhapatnam, free of delivery charges as per specified time.
- 5.3 Delivery of Goods/Services will not be considered complete until such goods or materials have been inspected and passed at the place specified for delivery by IMUV. The detailed list of components (Equipment and Service) supplied by the tenderer and Bill of Materials shall be provided well in advance for facilitating inspection by IMUV.
- 5.4 Rejected Goods/Services shall be removed by and at the expenses of the tenderer within seven days after notice. If not so taken away, the IMUV may seize the goods or materials to be removed and charge the tenderer with all expenses incurred in such removal.
- 5.5 The tender or any part share or interest in it shall not be transferred directly or indirectly to any person whomsoever without the written consent of IMUV.
- 5.6 It shall be lawful for IMUV, without giving any notice to the contractor, to purchase in the open market any goods or materials covered by the tender and if such goods or materials are not available to purchase suitable substitute, as to which, the decision of the IMUV shall be final and binding on the Contractor, in the event of the Contractor;
- (a) Having delivered goods or materials not of the contracted quality.
 - (b) Having failed to supply goods or materials within the time specified.
 - (c) Having refused or being unable to supply goods or materials covered by tender either in whole or in part.
- 5.7 In the event of the breach of any of the provisions of contract by the contractor, IMUV shall have the right to terminate the tender summarily.
- 5.8 In the event of IMUV terminating the contract for breach by the contractor of any of the provisions thereof, the contractor shall be liable for any loss suffered by IMUV up to the time of the termination of the contract and for any further loss which the IMUV may suffer during the remainder of the period originally covered by the contract.
- 5.9 In the event of the death, insanity or insolvency of the contractor, IMUV shall have the right to terminate the contract summarily and to purchase in the open market any Goods/ Services covered by the contract. In this case, the contractor shall not be liable for any excess in the price paid, for any such purchases over the tender price. In case

- of consortium the lead partner should nominate any other consortium member to bear the liabilities, and in case of individual organization the responsibility shall be taken up by the organization itself or by the legal successor.
- 5.10 With every delivery of goods or materials under this contract, invoices in triplicate shall be sent by the contractor to the IMUV receiving officer who will retain the original and duplicate copy with him, and return the triplicate copy to the contractor with the actual quantities weights and/or number duly acknowledged thereon after the goods or materials have been inspected and passed as per clause therein before mentioned.
- 5.11 Any notice to the tenderer shall deemed to be sufficiently served, if given or left in writing at his usual or latest known place of abode or business.
- 5.12 Upon the complete fulfilment of the contract by the contractor to the satisfaction of IMUV the amount deposited by the contractor, as security for the due fulfilment of the contract will be returned to him less the amount if any due by the contractor, not later than a month.
- 5.13 If however, the security is made up by a Bank Guarantee executed by a Bank, on behalf of the contractor it will be discharged and returned to the Bank, after collecting amount if any due by the contractor, not later than a month.
- 5.14 In these conditions unless there is something in the subject or context inconsistent there with words importing the singular shall include the plural and vice-versa words importing the masculine gender shall include the feminine and the words importing persons shall include bodies corporate.

SECTION - 6
SCHEDULE OF MINIMUM REQUIREMENTS

6.1 Scope of the Tender

6.1.1 Scope outline

6.1.1.1 This specification covers the requirements regarding procurement of material, fabrication, assembly, testing and supply of the propeller shafting assembly for Circulating Water Channel coupled with motor through thrust bearings, couplings accessories, spares, etc. complete.

6.1.2.1 The vendor shall be responsible for supplying all equipment/accessories and properly installing them as described in this specification. Other details and requirements which are not covered under this specification, but may be necessary to complete the propeller shafting assembly for CWC and/or to fulfill the operation/performance requirement shall be provided by the vendor, who will be responsible for the construction of the complete appliance to the full satisfaction of the owner.

6.1.2 Supply of Equipment

6.1.2.1 The supply shall include complete equipment including accessories, installation materials and spares as described in the subsequent paragraphs of the "Technical Specification".

6.1.3. Installation

6.1.3.1 The successful Tenderer shall depute their Service Engineer for installation of the Equipment. The Service Engineer shall demonstrate the satisfactory operation of equipment.

6.1.4 Manuals & Drawings

6.1.4.1 Two Sets of installation, operation and maintenance instruction manuals for the complete equipment shall be supplied along with the equipment.

6.1.5 General

6.1.5.1 The CWC equipment including all accessories shall be fabricated, tested etc. as per relevant Indian, International Standards, and these specifications wherever applicable and as per sound engineering practice.

6.1.5.2 All the equipment and accessories shall be fixed on the appliance in a compact and neat manner and shall be so placed that each part is easily and readily accessible for use and maintenance. The center of gravity shall be kept as low as possible. The equipment in its entirety shall give complete satisfaction to the IMUV.

6.1.6 Description of CWC and propeller shafting assembly

6.1.6.1 The CWC is a Hydrodynamic test facility and used to analyze flow around ships by visual observation techniques. It consists of a horizontal working section, 1, of 2.25m long x 0.5m wide x 0.5m deep dimensions [Refer Fig 1]. The propeller is placed at second bend,5, such that it is always completely submerged.

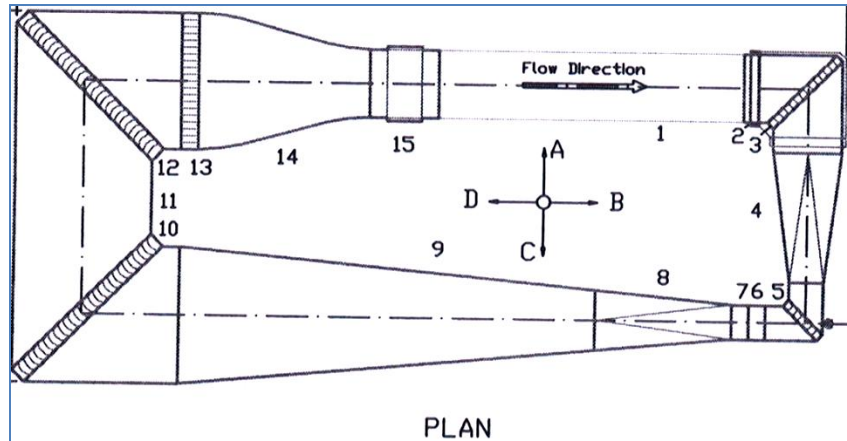


Fig 1 Layout of CWC Facility – Plan view

6.1.6.2 The layout for propeller arrangement assembled at section 5 is shown in Fig 2,3&4. It consists of a propeller and a boss connected to a propeller shaft through a key arrangement. A propeller cap is secured onto the strut. The propeller shaft passes through the water lubricated bearings which is force fitted into a strut.

6.1.6.3 A stuffing box is bolted at the outer wall to prevent water leakage. At the other end, the propeller shaft is coupled to the motor shaft through coupling and thrust bearing. The motor is bolted onto a solid cement block.

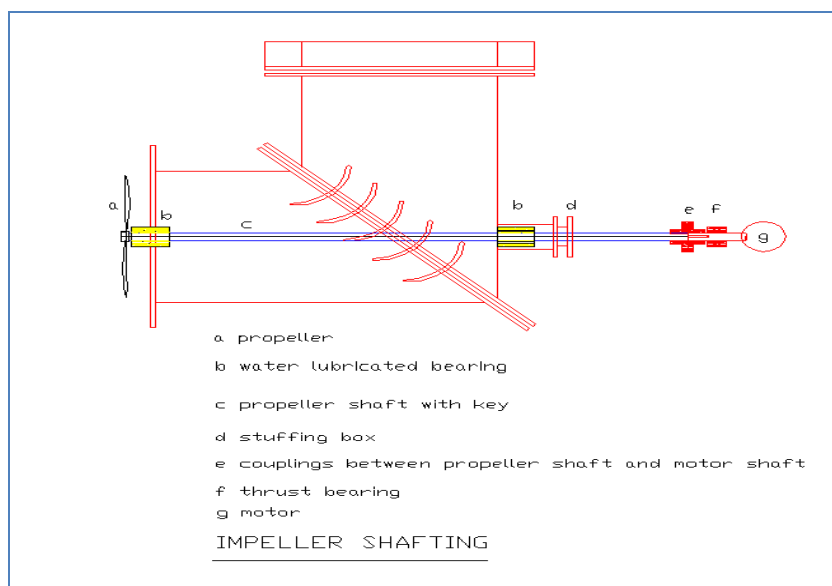


Fig 2 Propeller assembly layout - 1

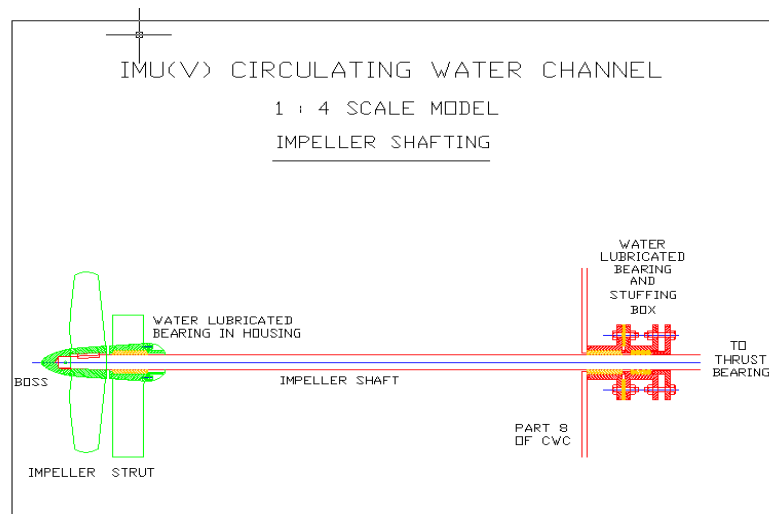


Fig 3 Propeller assembly layout – 2

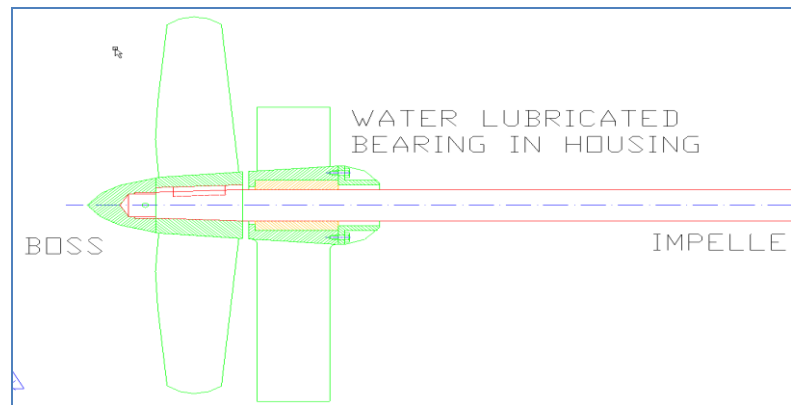


Fig 4 Propeller assembly layout – 3 (zoomed)

6.2. Bill of Materials

Sl. No.	Description:	Quantity
1	Propeller with boss and cap	1
2	Propeller shaft	1
3	Water Lubricated Bearing	2
4	Stuffing box with gland packing	1
5	Thrust bearing	1
6	Couplings with bolts and flexible pads	1
7	Electric motor with starter and control panel	1

6.3 Technical Specifications

6.3.1 Propeller with boss and cap

Description	
Material	Manganese bronze
Type	Standard Ka series without nozzle
Diameter	240mm
Expandable blade area ratio AE/AO	0.55
Pitch ratio P/D	1.2
Tolerances	± 0.01 mm

6.3.1.1 The dimensions for the propeller is shown in Fig 5,6&7.

6.3.1.2 The propeller cap should be properly secured to the strut and should be manufactured such that there is minimum disturbance of flow across it and the flow is maintained streamlined. The fasteners used for securing the cap should be flushed and should be non corrosive.

Table 6.16 Details of the K_a -series propellers (taken from Reference 26)

Dimensions of the K_a -screw series

r/R		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
Length of the blade sections in percentages of the maximum length of the blade section at 0.6R	from centre line to trailing edge	30.21	36.17	41.45	45.99	49.87	52.93	55.04	56.33	56.44	Length of blade section at 0.6R $= 1.969 \frac{D A_E}{Z A_0}$
	from centre line to leading edge	36.94	40.42	43.74	47.02	50.13	52.93	55.04	56.33	56.44	
	total length	67.15	76.59	85.19	93.01	100.00	105.86	110.08	112.66	112.88	
Maximum blade thickness in percentages of the diameter		4.00	3.52	3.00	2.45	1.90	1.38	0.92	0.61	0.50	Maximum thickness at centre of shaft = 0.049D
Distance of maximum thickness from leading edge in percentages of the length of the sections		34.98	39.76	46.02	49.13	49.98	-	-	-	-	

Fig 5 Propeller dimensions -1

Ordinates of the K_a -screw series

Distance of the ordinates from the maximum thickness

<i>r/R</i>	<i>From maximum thickness to trailing edge</i>					<i>From maximum thickness to leading edge</i>						
	100%	80%	60%	40%	20%	20%	40%	60%	80%	90%	95%	100%
	<i>Ordinates for the back</i>											
0.2	–	38.23	63.65	82.40	95.00	97.92	90.83	77.19	55.00	38.75	27.40	–
0.3	–	39.05	66.63	84.14	95.86	97.63	90.06	75.62	53.02	37.87	27.57	–
0.4	–	40.56	66.94	85.69	96.25	97.22	88.89	73.61	50.00	34.72	25.83	–
0.5	–	41.77	68.59	86.42	96.60	96.77	87.10	70.46	45.84	30.22	22.24	–
0.6	–	43.58	68.26	85.89	96.47	96.47	85.89	68.26	43.58	28.59	20.44	–
0.7	–	45.31	69.24	86.33	96.58	96.58	86.33	69.24	45.31	30.79	22.88	–
0.8	–	48.16	70.84	87.04	96.76	96.76	87.04	70.84	48.16	34.39	26.90	–
0.9	–	51.75	72.94	88.09	97.17	97.17	88.09	72.94	51.75	38.87	31.87	–
1.0	–	52.00	73.00	88.00	97.00	97.00	88.00	73.00	52.00	39.25	32.31	–
	<i>Ordinates for the face</i>											
0.2	20.21	7.29	1.77	0.1	–	0.21	1.46	4.37	10.52	16.04	20.62	33.33
0.3	13.85	4.62	1.07	–	–	0.12	0.83	2.72	6.15	8.28	10.30	21.18
0.4	9.17	2.36	0.56	–	–	–	0.42	1.39	2.92	3.89	4.44	13.47
0.5	6.62	0.68	0.17	–	–	–	0.17	0.51	1.02	1.36	1.53	7.81

Note: The percentages of the ordinates relate to the maximum thickness of the corresponding section.

Fig 6 Propeller dimensions - 2

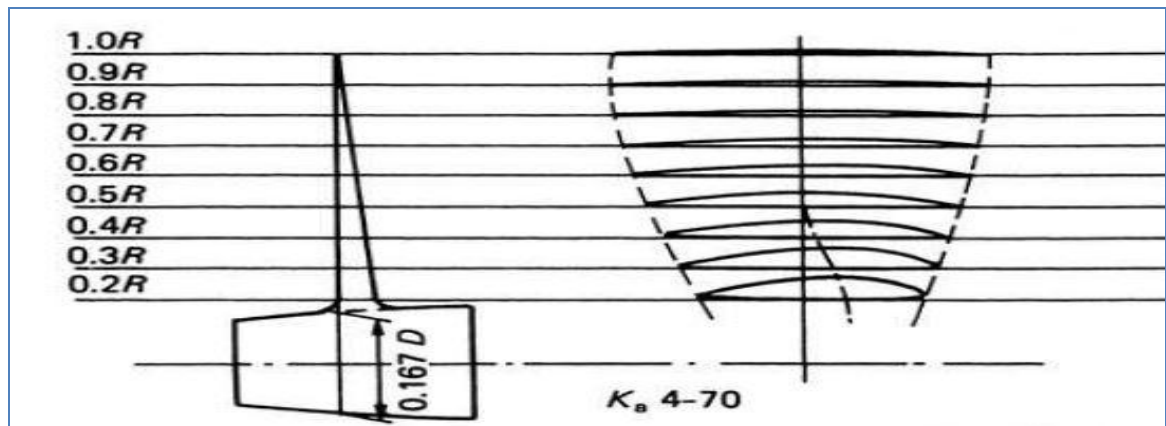


Fig 7 Propeller dimensions - 3

6.3.2 Propeller shaft

Description	
Material	Stainless steel (304)
Nominal Diameter	20mm (as per IS: 8173-1984)
Max overall length	900mm

6.3.2.1 The dimensions of propeller shaft limits shall be in accordance with IS: 8173-1984

6.3.2.2 Limits for parallel keys and keyways shall be in accordance with IS: 2048-1983

6.3.2.3 All contact parts shall be fine machined in accordance with IS: 3073 - 1967

6.3.3 Water lubricated bearing

Description	
Type	Sleeve type
Inner dia	20mm
Material	Phenolic resin or equivalent
Length	<=50mm
Outer dia	<=50mm

6.3.4 Stuffing box with gland packing

Description	
Shaft dia	20mm
Max rpm	2500rpm
Working medium	Fresh Water

6.3.5 Thrust bearing

Description	
Type	Double direction thrust ball bearing
Shaft Dia	20mm
Max axial thrust	750N

6.3.5.1 Suitable housing arrangement is to be provided for the thrust bearing to fit it and transmit the forces to ground.

6.3.6 Coupling with bolts and flexible pads

Description	
Type	Flexible type
Shaft dia	20mm
Design torque	57Nm

6.3.6.1 The coupling is chosen such that it couples the propeller shaft with the motor shaft through a key arrangement.

6.3.6.2 The coupling is chosen such that it allows for angular and parallel deviations for driver and driven shafts and allows them to be positioned within a short distance.

6.3.7 Electric Motor with starter and control panel

Description	
Power	MCR 10kW DC Motor
Max Speed	2500rpm
Input	3Phase, 440V AC, 50Hz
Mounting	Horizontal Foot Mounted
Speed control range	0 to 2500 RPM
Protection	IP22
Speed indicator	Digital
Shaft encoder	DC Tachogenerator
Control panel	
Speed control	Based on shaft encoder output ± 1% with Tacho Feedback
Communication Cable	Necessary data interfacing cable, power adapter
Speed indicator	Yes
LED Indicators	Yes
Power Connector	Yes

6.3.7.1 The starter panel should be capable of operating the motor at MCR from the AC power source indicated. The starter panel should include all necessary devices to safely operate and monitor functioning of the installation. By way of all protection devices, instrumentation to check proper input power source (Voltage, Frequency and Current) and DC power input to the motor (Voltage, Current) , Buttons to start, stop and emergency stop etc.,

6.3.7.2 Speed control panel should include gear to control the motor speed in the ranges specified and instrumentation (for ex: Motor speed (tachometer), applied voltage or current to the motor).

6.3.7.3 The direction of rotation for the motor shaft should be indicated on the motor.

6.4 Maintenance

6.4.1 The contractor shall provide necessary preventive and corrective maintenance support services for the supplied equipment; support should be available by phone, e-mail, sending the engineer to IMUV to solve the problem as soon as possible.

6.5 Comprehensive Warranty

6.5.1 The contractor shall ensure effective performance of the equipment supplied taking into account environmental factors like humidity, coastal climate etc., prevalent at IMUV, Visakhapatnam for one year from the date of acceptance.

6.5.2 Warranty support services

6.5.2.1 A comprehensive warranty for the supplied equipment shall be provided from the date of final acceptance of the equipment by IMUV. The contractor will be notified of any defect or claim arising under this warranty and the warranty support shall be provided at site.

6.5.3 If the contractor having been notified fails to remedy the defect within week days, IMUV may proceed to take such remedial action as may be necessary at the contractor's expense. The period that the equipment is out of commission as a result of contractor's failure to remedy the defects notified shall result in extension of the warranty period correspondingly and imposition of penalty.

6.6 Power Tolerance: The equipment shall operate correctly from a Three Phase 440Volts (+/- 15%) and 50 Hz (+/-6%) power supply. It should be capable of withstanding permissible voltage and frequency variations without any damage to the equipment or loss of the information.

6.7 Manuals, documentation and software: In addition to the Manuals given by the Manufacturers, the successful Tenderer shall prepare full documentation.

6.7.1 All equipments, accessories, and items which are useful and necessary shall be deemed to have been included in the scope of work. The installation shall be complete in all details whether such details have been mentioned in the specifications or not.

6.7.2 The contractor warrants that the equipment 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 tender. The tenderer further warrants that the equipment supplied under this tender shall have no defect arising from design, materials or workmanship (except in so far as the design or material is required by the purchaser's specifications) or from any act or omission of the tenderer.

6.8. Delivery and Installation

6.8.1 The tenderer is required to deliver and install the complete equipment within ten weeks from the date of placement of order.

6.8.2 The successful tenderer shall organize movement of supplied goods to respective locations within IMUV for installation.

6.8.3 Wherever installation is specified, it includes, loading of software configuring the equipment, and bring it into working condition.

6.9. User Acceptance Testing

6.9.1 Inspection and Tests: The authorized representative of IMUV shall have the right to inspect the equipment supplied under this tender and to test the equipment to confirm

its conformity to the specifications of the tender. The test may be conducted on the premises of the contractor at the point of delivery and at the final destination. When conducted on the premises of the contractor, all reasonable facilities and assistance shall be furnished to the inspector at no extra charge. Should any tested equipment fail to confirm to the specifications, IMUV may reject them and the contractor shall make suitable alterations with prior approval of IMUV to meet the requirements of the specifications without any effect on cost or delivery Schedules. IMUV's right to inspect, test and wherever necessary, reject the equipment shall be in no way limited or waived by reason of the equipment having been tested and passed by IMUV or its representative prior to shipment of the equipment.

- 6.9.2 Successful acceptance testing would be the basis for acceptance of the supplied equipment and criteria for acceptance would be formulated by the contractor and approved by IMUV prior to acceptance testing. The acceptance test, which involves demonstration of functionalities and associated operation of the complete goods, shall be conducted by the contractor in the presence of the authorized officials of IMUV and/or any other team or agency nominated by IMUV. All expenses for the special devices, if any, for installation and acceptance of the goods/services shall be borne by the contractor.
- 6.9.3 Prior to installation, the contractor shall describe in advance, the tests which propose to demonstrate the correct working of the entire setup both individually and as an integrated system and the same shall be approved by IMUV prior to commencement of tests.
- 6.9.4 The above tests shall demonstrate the satisfactory operation of all equipment as an integrated system covering the full range of facilities of the equipments.
- 6.9.5 The acceptance tests for supplied & installed goods, shall be carried out at IMUV by the contractor with the participation of concerned personnel from IMUV.
- 6.9.6 In case of the acceptance tests are not concluded to the satisfaction of IMUV the contractor shall repair or replace, at the contractor's cost, the whole or any part of the equipment as may be necessary for conclusion of the acceptance tests to the satisfaction of IMUV within the reasonable period agreed by IMUV. Demonstration of performance of the equipment should be repeated in the acceptance test.
- 6.9.7 IMUV reserves the right to accept the delivered items with deviations, provided the contractor agrees to rectify the deviations within an acceptable time period. Regarding the acceptance date, decision of IMUV would be final.
- 6.9.8 The contractor shall provide necessary consumables till the completion of acceptance testing.
- 6.9.9 Other acceptance criteria for
- 6.9.9.1 Propeller with boss and cap

- Review of mill test certificates and co-relation of raw materials before start of fabrication.
- Visual and dimensional check of part before assembly.
- Measurement of pitch, blade section thickness and blade inclination be in accordance with IS 9126 (Part3)-1979.
- All contact parts (Propeller blades, shaft, cap etc.) shall be fine machined in accordance with IS: 3073 – 1967
- Propeller is checked for dynamic balancing, strength, chemical composition in accordance with any of the IS / ISO / EN / NIST standards

6.9.9.2 Propeller shaft

- The dimensions of propeller shaft limits shall be in accordance with IS: 8173-1984
- Limits for parallel keys and keyways shall be in accordance with IS: 2048-1983
- Shaft taper and all contact parts shall be fine machined to a surface finish 1.6 – 6.3 μm in accordance with IS: 3073 – 1967

6.9.9.3 Thrust Bearing, Water lubricated bearings, Coupling and Electric Motor, Power supply and starter panels and speed control panel

- Test Certificate from OEM

6.9.9.4 The entire assembly is tested to check transmission of full propeller shaft torque to the propeller, while allowing for disassembly.

6.10. Documentation

6.10.1 The successful tenderer shall provide IMUV with necessary documents including the following:

- a) Operational and Maintenance Manuals of equipments
- b) Equipment serial numbers and models
- c) Test Certificates, Licenses if any
- d) Acceptance test results and acceptance status

6.10.2 Hardcopy of the above shall be handed over to nominated personnel of IMUV. Soft copy of the documents shall also be provided where applicable. Handing over of documents to IMUV by contractor is a pre-requisite for Acceptance.

6.11. Acceptance/Completion

6.11.1 The activity shall deem to have been completed with the completion of Supply, Installation and Commissioning of the equipment including training.

6.11.2 Upon completion of Supply/Work and after successful completion of other prerequisites like acceptance testing, Training etc, as prescribed in this document, IMUV shall receive a written undertaking from the contractor that the works have been completed

and accordingly a certificate of completion would be issued in respect of the supply/works. The warranty period for the supplied system would commence from the date of Acceptance/Completion.

ANNEXURE - 1

CONTENTS OF TECHNICAL BID

1. Covering letter containing
 - a) Tenderer Name & Address
 - b) Letter of authorisation to sign the tender document on behalf of the Firm
 - c) Bid validity
 - d) Confirmation to all clauses of the tender
 - e) Adherence to Prices quoted throughout the tender.
2. EMD in the form of Demand Draft
3. Eligibility Criteria
 - a) Bidders Particulars (**RST-01**)
 - b) Supplier's Authorization Form (**RST-02**)
 - c) Reference Sites (**RST-03**)
 - d) Annual Reports for the last three years
 - e) Infrastructure Facilities for Service support (**RST-04**)
 - f) Methodology (**RST-05**)
 - g) Signed copy of the Tender Document
4. Compliance Statement to specifications (**RST-06**)
5. Specifications, Brochures, Model, Leaflets etc., of all the equipment supplied along with OEM's Compliance
6. Items quoted by the Tenderer (**RST-07**)
7. Site requirements

ANNEXURE - 2

CONTENTS OF PRICE BID

1. Covering Letter containing:
 - a. Tenderer Name & Address
 - b. Bid validity
 - c. Letter of authorisation to sign the tender document on behalf of the Firm
 - d. Adherence to Prices quoted throughout the tender

2. Price Bid (**RSP-01**)

ANNEXURE - 3

FORM OF BANK GUARANTEE

Bank Guarantee No: _____

Date: _____

Valid up to _____

To

Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam - 530 005

Sir,

In consideration of Indian Maritime University, Visakhapatnam Campus, Gandhigram Visakhapatnam-53005 having its Registered Office at East Coast Road, Uthandi, Chennai-600119(hereinafter referred to as "IMUV") which expression shall mean and include its successors and assignees and having place an Order No. _____ dated _____ for _____ (hereinafter called "The Contract") which expression shall include all the amendments thereto with _____ having its Registered Office at _____ (hereinafter referred to as "The Contractor"), which expression shall unless repugnant to the context or meaning thereof, shall include all its successors, administrators, executors and assignees and IMUV, having agreed that The Contractor shall furnish the IMUV a Bank Guarantee for ₹ _____ (Rupees _____ only) as per the terms of Tender document No _____ dated _____ and Order dated _____.

We, _____ registered under the laws of India having its registered / head office at _____, (hereinafter referred to as the Bank) which expression shall unless repugnant to the context of meaning thereof, include all its successors, administrators, executors and permitted assignees do hereby guarantee and undertake to pay immediately on first demand in writing and any/all monies to the extent of Rs. _____ (Rupees _____ only) without any demur, reservation, contest or protest and/or without any reference to the Contractor. Any such demand made by the IMUV on the Bank by serving return notice shall be conclusive and binding, without any proof, on the bank as regards the amount due and payable, notwithstanding any dispute pending before any Court, Tribunal, Arbitrators or any other Authority and/or any other matter or things whatsoever, as liability under these presents being absolute and unequivocal. We agree that Guarantee herein contained shall be irrevocable and shall continue to be enforceable until it is discharged by IMUV in writing. This guarantee shall not be determined, discharged or affected by liquidation, winding up, dissolution or insolvency of the Contractor and shall remain valid, binding and operating against the Bank.

The Bank also agrees that IMUV of its option shall be entitled to enforce this Guarantee against the bank as a principal debtor, in the first instance, without proceeding against the Contractor and notwithstanding any security or other guarantee that IMUV may have in relation to the Contractor's liabilities.

The Bank, further agrees that IMUV 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 the said Contract or to extent time of performance by the said Contractor from time to time or to postpone for any time or from time to time exercise of any of the powers vested in IMUV against the said the Contractor and forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relieved from our 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 IMUV or any indulgence by IMUV to the said Contractor or any such matter or thing whatsoever which under the laws relating to the sureties would, but for this provision have effect of so relieving us.

The Bank further agrees that the guarantee herein contained shall remain in full force until _____ and all dues of IMUV under or by virtue of this contract have been fully paid and its claim satisfied or discharged or till IMUV discharges the guarantee in writing, whichever is earlier.

This guarantee shall not be discharged by any change in our constitution, in the constitution of IMUV of that of the Contractor.

The Bank confirms that this Guarantee has been issued with observance of the appropriate laws of the country of issue.

The Bank also agrees that this Guarantee shall be governed and construed in accordance with Indian Laws and subject to the exclusive jurisdiction of Indian Court of the place from where tenders have been invited.

We further agree that as between us and IMUV for the purpose of this Guarantee any notice given to us by IMUV that the money is payable by the Contractor and any amount claimed in such notice by IMUV shall be conclusive and binding on us notwithstanding any difference between IMUV and the Contractor or any dispute pending before any Court, Tribunal Arbitrator or any other authority. We further agree that this Guarantee shall not be affected by any change in our constitution or that of Contractor. We also undertake not to revoke this Guarantee during its currency.

Notwithstanding anything contained herein above, our liability under this Guarantee is limited to Rs. _____/- (Rupees _____ only) and Guarantee shall remain in force until _____.

We must receive any claim under this Guarantee before the expiry of this Bank Guarantee. If we have received no such claim by the said date, the rights of IMUV under this Guarantee will cease. However, if such a claim has been received by us within the said date, all the IMUV's right under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

In witness whereof, the Bank through its authorized officer has set its hand and stamp on this
_____ Day of _____ 2013 at _____

Date:

Authorized Signatory of the bank
(with Bank Seal)

Place:

Witness No.1

Witness No.2

RST- 01:

RESPONSE SHEET FOR TECHNICAL BID

BID PARTICULARS FOR TENDER No:

1. Name of the Bidder _____
2. Address of the Bidder _____

3. Bidder's proposal number and date _____

Signature of the Tenderer with Seal

Date :

Place :

RST-02:

SUPPLIER'S AUTHORISATION FORM

To

Director,
Indian Maritime University
Visakhapatnam Campus
Gandhigram
Visakhapatnam-530005
Andhra Pradesh, India

Ref: Tender No. _____

Sir,

WHEREAS _____ who are official producers / authorized Sales and Service dealers, of _____ do hereby authorize _____ located at _____ (to submit a bid and sign Tender with you for resale and support of the following Products supplied by us, for the quantities, specifications and delivery schedule called for by the Schedule of Requirements associated with the above Invitation for Bids:

Product Description	Type

We hereby extend to you a full guarantee and warranty and maintenance support, availability of spares from the date of submission of the tender, in accordance with the Conditions of Tender along with the Standard Product Warranty, and duly authorize the Bidder to act on our behalf in fulfilling all warranty and support obligations with respect to the above-listed products offered for resale by the Bidder in relation to this Invitation for Bids.

Name _____ in the capacity of _____

Signed _____

Duly authorized to sign the authorization for and on behalf of

Dated on _____ day of _____

Note: This letter of authorization must be on the letterhead of the supplier, must be signed by a person competent and having the power of attorney to bind the supplier, and must be included by the Bidder in its bid.

RST-03:

REFERENCE SITES

Sl. No	Client-Name Address	Equipment supplied commissioned	Executed by (name of Tenderer)	Value of supply (Rupees in Lakhs)	Date of Commissioning by the Tenderer	Present Operational Status

Signature of the Tenderer with Seal

Date :

Place :

RST- 04:

INFRASTRUCTURAL FACILITIES FOR SERVICE SUPPORT

Sl. No.	Address where Service Centre is situated	Contact Person	Availability of Stores (YES/NO)	Year of Establishment	No of Service Engineers indicating their areas of specialization, certifications

Signature of the Tenderer with Seal

Date :

Place :

RST- 05:

METHODOLOGY

Sl. No	Item Description	Methodology Adopted along with time plan
Tender for Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey basis consisting of below description		
1	Propeller with boss and cap	
2	Propeller shaft	
3	Water Lubricated Bearing	
4	Stuffing box with gland packing	
5	Thrust bearing	
6	Couplings with bolts and flexible pads	
7	Electric motor with starter and control panel	

Signature of the Tenderer with Seal

Date :

Place :

RST-06:

COMPLIANCE STATEMENT

Sl. No	Item Description	Compliance to Specification Yes/No	
	Tender for Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey basis consisting of description below description		
1	Propeller with boss and cap		
	Material		Manganese bronze
	Type		Standard Ka series without nozzle
	Diameter		240mm
	Expandable blade area ratio AE/AO		0.55
	Pitch ratio P/D		1.2
	Tolerances	± 0.01 mm	
2	Propeller Shaft		
	Material		Stainless steel (304)
	Nominal Diameter		20mm (as per IS: 8173-1984)
	Max overall length		900mm
3	Water lubricated bearing		
	Type		Sleeve type
	Inner dia		20mm
	Material		Phenolic resin or equivalent
	Length		<=50mm
	Outer dia	<=50mm	
4	Stuffing box with gland packing		
	Shaft dia		20mm
	Max rpm		2500rpm
	Working medium	Fresh Water	
5	Thrust bearing		
	Type		Double direction thrust ball bearing
	Shaft Dia		20mm
	Max axial thrust		750N
	Housing		
6	Couplings with bolts and flexible pads		
	Type		Flexible type
	Shaft dia		20mm
	Design torque	57Nm	
7	Electric motor with starter and control panel		
	Power		MCR 10kW DC Motor
	Max Speed		2500rpm
	Input		3Phase, 440V AC, 50Hz
	Mounting		Horizontal Foot Mounted
	Speed control range		0 to 2500 RPM
	Protection		IP22
	Shaft encoder		DC Tachogenerator
	Starter panel		
Control panel			

Signature of the Tenderer with Seal

Date :
Place :

RST-07:

ITEMS QUOTED BY THE TENDERER
(Item wise Details)

Sl. No	Item Description	Make & Model	Specifications	Qty quoted for
Tender for Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey basis for equipment consisting of -				
1	Propeller with boss and cap			
2	Propeller shaft			
3	Water Lubricated Bearing			
4	Stuffing box with gland packing			
5	Thrust bearing			
6	Couplings with bolts and flexible pads			
7	Electric motor with starter and control panel			

Signature of the Tenderer with Seal

Date :

Place :

RSP-01

RESPONSE SHEET FOR PRICE BID

Sl. No	Item Description	Qty	Rate per unit (In figures and in Words)	All applicable Taxes and Duties in %	Amount of all applicable taxes (In figures and in Words)	Total Amount inclusive of all taxes and duties (In figures and in Words)
Tender for Supply, Installation and Commissioning of Equipment for Circulating Water Channel on Turnkey basis for equipment consisting of:						
1	Propeller with boss and cap	1				
2	Propeller shaft	1				
3	Water Lubricated Bearing	2				
4	Stuffing box with gland packing	1				
5	Thrust bearing	1				
6	Couplings with bolts and flexible pads	1				
7	Electric motor with starter and control panel	1				
Total Amount in Figures						
Total Amount in Words						

Note: The taxes and duties applicable should be clearly specified by the Tenderer in the Price Bid and charges such as Insurance, Freight and forwarding shall be borne by the Tenderer.

Signature of the Tenderer with Seal

Date :

Place :