

Department for Ocean Engineering
Indian Institute of Technology Madras
Chennai – 600 036

Ref.: OED/13/01/MEWM

Date: 10th January 2013

Due date:

1. Pre-bid meeting: 3 pm 17 Jan. 2013
2. Submission of technical and commercial proposals: 3pm, 31 Jan. 2013
3. Technical bid opening: 3.30pm 31 Jan. 2013

1. Quotations are invited for the item shown in enclosed list as Annexure 1.
2. The quotations must be in two bid system consisting of technical bid and financial bid. Both the bids should *be in separate cover* and enclosed in the *single envelop* in sealed cover.
3. The Quotations duly sealed and super scribed on the envelope with the reference No. and due date, should be addressed to the Head, Ocean Engineering so as to reach him on or before the due date stipulated above.
4. The Quotations shall be valid for 180 days from the due date and the period of delivery required, warranty terms etc. should also be clearly indicated.
5. Brochure detailing technical specifications and performance, list of industrial and educational establishments where the items enquired have been supplied must be provided.
6. Compliancy certificate is to be provided indicating conformity to the technical specifications.
7. If the item is under DGS&D Rate contract, No. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price (Please note that we are not Direct Demanding Officers). If so please send copy of the RC.
8. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples / machine/ equipment if called for should be submitted / demonstrated at free of charges, and collected back at the supplier's expenses.
9. Packing and delivery charges must be clearly indicated.
10. The rate of sales / General Taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for Sales / General Taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have concessional Sales Tax applicable to non Government Educational Institutions run with no profit motive for which a concessional Sales Tax Certificate will be issued at the time of final settlement of the bill.
11. IIT Madras is exempt from payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand. IIT Madras will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges.
12. Goods should be supplied carriage paid and insured.
13. Goods shall not be supplied without an official supply order.
14. Payment: Every attempt will be made to make payment within 30 days from the date of receipt of bill acceptance of goods, whichever is later.
15. Acceptance and Rejection:- I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

Yours faithfully,

The Head, Ocean Engineering

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DEPARTMENT OF OCEAN ENGINEERING IIT, MADRAS

Ref: OED/13/01/MEWM

CALL FOR TECHNICAL AND COMMERCIAL PROPOSALS

FOR THE

Upgradation of Wave Generation Control Hardware and Development of Data Acquisition Software Package for the Multi Element Wave Maker in a suitable operating environment


The Department of Ocean Engineering, Indian Institute of Technology Madras has unique wave generation facilities for the simulation of ocean waves in the laboratory. One such facility is the large **wave basin** of size, 30m x 30m with a water depth of 3m. This wave basin has a wave paddle system that consists of 52 paddles that can operate in different phases to produce oblique and short crested waves. At present, the wave generation using this paddle system is through DOS operating system that was installed about two decades ago. In the upgradation process, it is intended to develop an integrated package to operate in a suitable operating system such that the cost effective sustainability of it is achieved for long duration. It is preferred to have a WINDOWS front end for the users irrespective of the operating system adopted for the control system. The integrated package, in addition to necessary hardware, includes suitable software for wave generation and data acquisition.

The scope of the work includes,

1. Study of the present wave generation system
2. Development of Wave Generation Software with all relevant transfer functions in a suitable operating system environment as an integrated package.
3. Development of integrated data acquisition system along with wave generation software for synchronized data sampling.
4. Identification, design and supply of suitable control (hardware) cards compatible with the existing hydraulic power pack and Moog servo valve, and the proposed wave generation software.
5. Identification, supply and integration of suitable data acquisition system.

The integrated package should have the following:

1. Development of GU Interface based Wave generation software package to replace the present DOS version.
2. Design of suitable hardware system for the replacement of existing 52 paddle Digital Servo Control Cards.
3. Design of suitable hardware system for multiple 16 / 32 Channel Data acquisition System (Required number of channels is 64 with a data sampling rate of 1kHz each channel).

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4. The export and import of data should be feasible and the data format should be compatible with ASCII, Labview, Matlab and Visual studio.
5. Testing, Calibration and Integrating the developed one with existing actuators and Hydraulic Power pack system.
6. Development of RS485/ RS422 TC protocol-IP based communication
7. Installation, Commissioning, complete documentation and professional training in the field of Operation and Maintenance.
8. System training on the operation of the software at our site before handing over the system.

Available resources:

- A. 52 paddle MULTI ELEMENT WAVE MAKERS, each 0.5m wide and operated using 52 Hydraulic servo drives. The Host PC is interfaced with
- a) Hydraulic Power pack with PLC controllable system and
 - b) 52nos of Digital Servo controller Cards with a closed feedback control system, the upgradation of which forms the most important part of the proposal envisaged.


B. The requirement of any hardware including personal computers for testing purposes/ expected assistance during the testing face should be spelt out in the quotation for making suitable arrangements. Vendor may also note that IIT Madras will not necessarily accept to oblige your requirements.

Vendor can maximize the utilization of the existing system for the present development but without any constraint on its use by IITM. Any additional hardware or other items considered necessary can be proposed under this package.

The MEWM system (hydraulic and control system) in the present stage will be handed over to the vendor on the day of work order in working condition. During the course of upgradation, if some of the components which are not the part of the proposed upgradation (but still required for the upgraded system to function) fails from its functional aspect, then vendor needs to take the responsibility to rectify the fault or replace such components. IIT Madras will make the payment only to the vendor as per actual expenditure on proof of service / purchase by the vendor on mutually agreeable claim. This applies to all the hydraulic components, servo valves and LVDT.

Call for Technical and Commercial proposal

Based on vendor's expertise in understanding our system to be upgraded, vendor is invited to submit the Technical and Commercial proposals before 31 Jan. 2013. Vendor is required to submit the technical and commercial proposals in two separate sealed covers and both of the above covers should be placed inside another cover, sealed and submitted. An unpriced


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commercial bid (blank commercial bid) should be placed within the technical proposal package so that any clarifications can be sought before opening the commercial bid.

Vendor is advised to add any number of additional optional items that are required for efficient running of the system. Also, under optional requirements, vendor is required to quote a cooling system for 'Hydraulic Oil' to sustain the wave maker operation for a sufficiently longer duration. It is implicit understanding that all the proposed hardware components should be of high quality and software supplied robust

The bidder may be asked to present before the Technical Committee before opening up the Commercial bid. But this is based on requirement for any clarification on the proposed item(s).

Warranty clause: The tender requirement is to include 24 months comprehensive warranty for the supplied components under this project and in addition, 36 months comprehensive warranty¹⁷ on a chargeable basis. The latter three years 'Annual Maintenance Contract' starts from the start of third year from the commissioning date.


It is the responsibility of the successful vendor to provide an upgraded system to pass the acceptability criteria listed below before handing over. If only part of the system is upgraded (depending on the approved bid), it is still the responsibility of the vendor to make the entire system to run coherently to produce waves as per the acceptability criteria given below. IIT Madras will not accept failure to deliver for the sake of malfunctioning of one of the existing components.

Acceptability criteria:

- a. To generate regular harmonic waves of smaller amplitude with wave period, 0.8s, 1.2s, 1.6s, 2.0s and 2.5s for a duration of 30min each continuously.
- b. To generate a regular harmonic wave with the wave height of 50 cm and period of 1.6s for a duration of 5 min continuously.
- c. The measurement of wave height (an average 5 wave cycles immediately after the transient wave) will be made using resistance type wave gauges. The maximum acceptable deviation between input and measured wave heights is 2 % for both (a) and (c).
- d. The generation of uni-directional random waves and multi directional random waves needs to be demonstrated. The reproduction of such waves will be tested with the ensemble wave parameters: significant wave height, peak wave period and mean wave direction.

Payment terms:

- a. 10% payment within 15 days of the release of drawings and concept. The same has to be submitted within 15 days from the date of work order.

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- b. 70% payment (either by LC for foreign currency) or direct payment within India after the proposed hardware has reached IIT Madras and the control system software has been developed.
- c. 15% payment after the installation and commissioning.
- d. 5% payment at the beginning of 2nd year after commissioning. The successful firm has to make 5 % bank guarantee before the release of this payment and the bank guarantee will be released at the end of second year (i.e., at the end of comprehensive 24 months warranty period is completed).

Important dates:

1. Pre-bid meeting: 3 pm 17 Jan. 2013
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2. Technical bid opening: 3.30pm 31 Jan. 2013
3. Commercial bid will be opened only for successful technical bidder after intimation to them.

Please quote the rate with the following details:


1. Quotation validity minimum 180 days.
2. Mention delivery period.
3. Tax details.
4. Payment after supply. Advance payment will not be allowed for private concern.
5. IIT is exempted from E.D.
6. The technical and commercial quotations should be sealed in separate covers and identified clearly on them. A bigger envelope encompassing both the above envelopes should be submitted, sealed, on or before the above date.
7. The technical bid will be opened and scrutinized by a technical committee of IITM, which will qualify the bidders for their technical suitability. Commercial bids of only qualified companies with clear, proven technical know-how will be considered for further processing.

FORCE MAJEURE

Neither the Agency nor the owner shall be considered in default in performance of its obligations hereunder if such performance is prevented or delayed for any causes beyond the reasonable control of the party affected, such as war, hostilities, revolution, riots, civil commotion, epidemic, major fires, explosions, floods, earthquakes or because of any law, order, proclamatory regulations or ordinance of Government, provided notice in writing of such cause with necessary evidence that the obligation under the Contract is thereby affected or prevented or delayed, is given within 14 days from the happening of the event and in any case it is not possible to serve the notice within the said 14 days period, then within the shortest possible period without delay. As soon as the cause of Force Majeure has been removed, the party whose ability to perform its obligation has been affected shall notify the other party the actual delay occurred on account of such activities.

Although the time for completion of work shall be suitably extended (not exceeding the period during which the work was stopped on account of Force Majeure clause), such extension shall

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not result in any financial claim by the Agency against the Owner on any account of such a delay for any other reason whatsoever.

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