INTEGRATED HEADQUARTERS OF MINISTRY OF DEFENCE (NAVY)
DIRECTORATE OF NAVAL ARCHITECTURE

INVITATION FOR EXPRESSION OF INTEREST (EOI)

DEVELOPMENT OF MARINE BILGE OILY WATER SEPARATOR (OWS)'

Reference : **Defence Acquisition Procedure 2020 (DAP 2020)**

Appendices:

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Introduction

1. Indian Navy has been focusing on developing indigenous platforms, equipment and systems/sub-systems/components towards achieving enhanced self-reliance. This Expression of Interest (EoI) invites responses from eligible Indian Companies for Indigenous Design and Development of Marine Bilge Oily Water Separator (OWS), here and after referred as OWSs for Indian Navy. The present proposal for development of Marine Bilge Oily Water Separator under Make-II category is termed as 'Project Indigenous Design and Development of Marine Bilge Oily Water Separator (OWS)'. The Ministry of Defence (MoD), Govt of India, shall own Marine Bilge Oily Water Separator and the information regarding the project will be shared strictly on 'Need to Know' basis.

2. The Indigenous Design and Development of Marine Bilge Oily Water Separator (OWS) has been approved as 'Make-II' category project. Subsequent procurement will be under the '**Buy (Indian-IDDM)**' category. The project is reserved for MSMEs as stipulated in Para 12 of Chapter III of DAP 2020. If at least two MSMEs do not

express interest, the programme shall be opened up for all, under the condition that interested MSME(s), if any at that stage and meeting the eligibility criteria will get preference over non-MSMEs in selection of DA/(s) in accordance with Para 12, Chapter - III of DAP 2020.

Objective

3. The objective of this EoI is to seek responses from eligible Indian industries and to shortlist potential companies. Responses to EoI will be evaluated as per the assessment criteria given in the EoI. Project shall be progressed ahead even if only one EoI respondent is found meeting eligibility criteria.

Layout

4. The EoI has been covered under the following parts:-

(a)	Part I	:	General Information
(b)	Part II	:	Technical Requirements
(c)	Part III	:	Critical Technology Areas
(d)	Part IV	:	Eligibility Criteria
(e)	Part V	:	Assessment Parameters
(f)	Part VI	:	Evaluation Criteria of Assessment Parameters
(g)	Part VII	:	Documents to be submitted by EOI Respondents
(h)	Part VIII	:	Queries and Clarifications
(j)	Part IX	:	Miscellaneous

PART I: GENERAL INFORMATION

5. The project, i.e. indigenous development of '**Marine Bilge Oily Water Separator (OWS)**' has been approved under the 'Make-II' category for the **Prototype development (Qty 02)** and for subsequent procurement of **12 in nos Marine Bilge Oily Water Separator along with accessories** under the 'Buy (Indian-IDDM)' category as per DAP 2020. Details of the stages involved in the development process are enumerated in Chapter III of DAP 2020. The progress of the project will be monitored by the Project Facilitation Team (PFT) of Indian Navy/MoD constituted for this purpose. PFT will act as interface between India Navy and Industry during the design and development stage of the project. ***No reimbursement of development cost is permissible under Make-II scheme***.

6. **Eligibility to Respond to an EoI**. The eligibility criteria shall be in accordance with Para 20 of Chapter 1 of DAP 2020, which stipulates that unless specifically provided for in a clause/section/chapter or elsewhere of the DAP, an Indian Vendor by whatever nomenclature when referred to means - for defence products requiring industrial license, an Indian entity, which could include incorporation/ownership models as per Companies Act, Partnership Firm, Proprietorship and other types of ownership models including Societies as per relevant laws, complying with, besides other regulations in force, and the guidelines/licensing requirements stipulated by the Department for Promotion of Industry and Internal Trade (DPIIT) as applicable. For defence products not requiring industrial license, an Indian entity registered under the relevant Indian laws and complying with all regulations in force applicable to that industry will be classified as an Indian Vendor. The following two additional conditions will apply to the definition for Buy(Indian-IDDM), Make II, Development cum Production Partner (DcPP) in D & D acquisitions through DRDO/DPSUs/OFB and SP Model categories:-

(a) Ownership by Resident Indian Citizen(s). Further, a company is considered as 'Owned' by resident Indian citizens if more than fifty percent (50%) of the capital in it is directly or beneficially owned by resident Indian citizens and / or Indian companies, which are ultimately owned and controlled by resident Indian citizens. This implies that the maximum permitted Foreign Direct Investment (FDI) shall be forty nine percent (49%). No pyramiding of FDI in Indian holding companies or in Indian entities subscribing to shares or securities of the Applicant Company or the Strategic Partner shall be permitted. Indirect foreign investment shall be accounted for in counting the forty-nine percent (49%) FDI.

(b) Control by Resident Indian Citizens(s) (As defined in Companies Act 2013). 'Control' shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.

7. **Indigenous Content**. Vendors offering indigenously designed, developed and manufactured product having minimum of 50% Indigenous Content(IC) on cost basis of the base contract price are eligible. Apart from overall IC as detailed above, the same percentage of IC will also be required in (a) Basic Cost of Equipment; (b) Cost of Manufacturers' Recommended List of Spares(MRLS); and (c) Cost of Special Maintenance Tools (SMT) and Special Test Equipment(STE), taken together at all

stages, including FET stage. For IC on cost basis, vendor should ensure compliance as detailed in **Appendix 'A'** and furnish a certificate as per **Annexure 1 to Appendix 'A'**. For Indigenous Design, the vendor is required to furnish 'Undertaking to Comply with Indigenous Design', placed at **Annexure 2 to Appendix 'A'**. Compliance to the same will be ensured by the PFT during Single Stage Composite Trials (SSCT).

8. **Embedded Software**. Wherever software is used, details of the software including Source Code and Firmware Support Manual for embedded software shall be provided. All supplied software should be verified & validated by OEM for use of the designated Production Agency.

9. **Intellectual Property Rights (IPRs)**. Intellectual Property Rights of Government in "Make" projects are placed at **Appendix 'B'**. Development Agency/Agencies (DA/DAs) shall retain title or ownership and all other rights in intellectual property generated during the development of project. However, the Government shall have March-in rights under which the Government can require the contractor to grant, or may itself grant license for, inter alia, the following reasons:-

(a) Where health and safety requirements so require the Government to act in public interest;

(b) For National Security Reasons;

(c) To meet requirements for public use not reasonably satisfied by the contractor;

(d) For failure of the contractor to substantially manufacture the products embodying the subject invention in India; or

(e) For failure of the contractor to comply with any of the requirements laid down under these guidelines.

10. **Foreign Collaboration**. If the DA(s) collaborate(s) with a foreign firm as a technology provider in a certain technology area for the project, the nature of such collaboration and the technology areas being transferred must be clearly stated in the response. The contribution of the Indian industry in acquiring, developing and indigenising including design critical technologies shall be one of the key criteria in assessment of various proposals.

11. No component or any sub system of Marine Bilge Oily Water Separator shall be subjected to any type of inspection or audit by any Foreign Govt or Agency without prior approval of MoD, Govt of India.

12. A trusted supply chain that will include the engineering support requirements would be established for all components of Marine Bilge Oily Water Separator. All documents related to the Marine Bilge Oily Water Separator project are liable to be audited by Indian Govt or its nominated agency.

13. Detailed information about blacklisting of the company/consortium partners and foreign technology partner by any Govt Agency in India/ any other country would be provided as part of the response. Companies currently blacklisted by any Indian Govt Agency are ineligible for participation. Any such information not disclosed but revealed at a later stage would render the Company/Consortium ineligible for further participation.

14. **Time frames and critical activities**. The important time frames and critical activities for the Project Marine Bilge Oily Water Separator are as follows:-

Ser	Activity	Time in Weeks
(a)	Issue of EoI	T_0
(b)	EoI Response Submission	T_0 + 8
(c)	EoI Response Evaluation	T_0 + 14
(d)	Issue of Project Sanction Order	T_0 + 16
(e)	Design & Development of prototype	T_0 + 64
(f)	Single Stage Composite Trials (SSCT)	T_0 + 71
(g)	Conversion of PSQRs to SQRs	T_0 + 73
(h)	Issue of Commercial RFP	T_0 + 75
(j)	Solicitation of Commercial offer	T_0 + 79
(k)	Finalisation of CNC	T_0 + 83
(l)	Signing of Contract	

15. **Milestones of the Project**.

(a) **Evaluation of EoI Responses**. EoI responses will be evaluated in accordance with assessment parameters and evaluation criteria given in Part VI & VII of the EoI. All the shortlisted companies will be called Development Agencies (DAs). **The project is presently reserved for MSMEs, however if at least two MSMEs do not respond, the Project shall be opened up for all, under the condition that interested MSME(s), if any at that stage and meeting the eligibility criteria, will get preference over Non-MSMEs in selection of DAs**. Project shall be progressed ahead even if only one EoI respondent is found meeting the eligibility criteria.

(b) **Project Sanction Order**. PFT will issue Project Sanction Order for the development of prototype with **Nil** financial implication for Indian Navy/MoD. In case of only single vendor having offered the developed prototype ready for user trials within timelines stipulated in the Project Sanction Order, not more than two time extensions will be accorded to other vendors and thereafter the case is shall be progressed as resultant Single Vendor Case (SVC).

(c) **Design and Development of Prototype**. PFT will act as the primary interface between the Indian Navy and the industry during the design and

development stage under Make-II subcategory projects and facilitate the following:-

(i) Finalisation of trial methodology.

(ii) Provision of requisite professional inputs/documentation (if feasible/available with ***IN***) to industry.

(iii) Providing clarifications related to functional or operational aspects of the store under development, as may be sought by the DAs from time to time, during the design and development of prototype.

(d) **Manufacture of Prototype**. The prototype production drawings and documentations post examination and approval of PFT members for technical compliance will be approved by DQA (WP) for QC compliance. Thereafter, QAP (Quality Assurance Plan) in accordance QAD-R02 will be prepared by DAs and submitted for approval by DQA (WP). The production of the prototype will be undertaken under the inspection of DQA (WP) based on the approved QAP.

(e) **Single Stage Composite Trials**. Single Stage Composite Trials **(SSCT)** would be carried out by Indian Navy/ PFT to validate the performance of the equipment against the approved technical specifications after the development of prototype. Indian Navy/ PFT will formulate the trial directives and constitute the Trial Team. The trial directive will specify the fundamental points that need to be addressed for validating the 'essential' parameters. The validation of the support system and maintainability trials, integral to and complementing the trial program of the defence equipment/upgrades/product/system shall be held simultaneously, wherever feasible. **Two prototype** is envisaged for prototype development including user trials. Documents regarding number of prototypes used for certain development may be produced to the trial team. The user trial location will be informed prior trials. Safe to use certificate should be forwarded by the development agencies. Trial Methodology is placed at **Appendix 'J'**.

(f) **Staff Evaluation**. Based on SSCT, the Indian Navy would carry out a Staff Evaluation, which gives the compliance of the demonstrated performance of the store vis-à-vis the specification. On the acceptance of Staff Evaluation report, the specification shall form the basis for the 'Buy (Indian-IDDM)' category of acquisition. If the prototypes of only a single firm/individual clears the trials, the project will be progressed as resultant single vendor.

(g) **Finalisation of Staff Qualitative Requirements (SQRs)**. PFT will facilitate the finalisation of preliminary SQRs to final SQRs prior to commencement of user trials. The specification of the equipment would therefore be a part of the trial directives, and only the essential parameters as detailed in the specification will be tested.

(h) **Solicitation of Commercial offers**. A commercial Request for Proposal (RFP) for '**Buy (Indian-IDDM)**' phase will be issued to all DAs for submission of their commercial offer **post completion** of Single Stage Composite Trials (SSCT). Single Stage Composite Trials **(SSCT)** will be conducted at all the firms

premises or/ and onboard nominated ***IN*** platforms, which are ready with the prototype, by the Project Facilitation Team in order to establish completion of development of prototypes along with test certificates in lines of mandated specifications. This would include all destructive/ non- destructive checks by the NABL/QA agencies on the prototype (as applicable).

(i) **Award of Contract**. Commercial offers of only those DAs/vendors will be opened whose equipment has been short-listed consequent to Staff Evaluation and the L1 bidder would be determined based on the provisions of the Commercial RFP and awarded the contract for manufacture.

16. Once the prototypes are successfully validated, 12 in nos OWS plants along with accessories shall be procured by MoD, Govt of India under **Buy (Indian-IDDM)** category **against a RFP**. Delivery of the OWS plants shall be in a phased manner as per schedule promulgated by IHQ-MoD(N).

17. **Other successful DAs that have developed the prototype successfully but have not qualified as L1, would be issued a certificate by DDP indicating that product/system has been successfully trial evaluated**.

PART II : TECHNICAL REQUIREMENTS

18. **Scope of the Project**. The scope of Project involves development of Marine Bilge Oily Water Separator includes for installation onboard ***IN*** ship. The OWS should comply with **DEFSTAN 02-322** and latest MARPOL regulations **MEPC 107(49)**.

19. **Environmental Conditions**. The equipment are to be designed for environmental conditions as specified in **NES 1004 and MEPC 107(49) resolution as** tabulated below:-

Description	Value
Ambient Air Temperature	0 °C to Max 45 °C (Dry Bulb)
Max Compartment air temperature	Upto 55 °C
Max Relative Humidity	90% at 35 °C
Max Ambient Sea Water Temperature	Upto 35 °C
Salinity of Sea Water	36000 ppm
Vibration, including vibration during motion or weapon operations	IAW ISO 10816-3
Structure Borne Noise (SBN)	MIL-STD-740-2 (in one third octave band)
Air Borne Noise (ABN)	MIL-STD-1474-E (in octave band)
Dust/Dirt	IP 58
Electrical, Magnetic and Electro-magnetic	Compliant to MIL STD 461 E/F
Roll	Max $\pm$30° with 10 sec period
Pitch	Max $\pm$10deg with 20s period
Trim	Max 5°
List	Max 20° from vertical

Design Requirements

20. **Design**. The prototype being developed as part of Indigenous Design and Development of Oily Bilge Water Separator should comply with the design specifications as per **DEF STAN 02-322** and **IMO resolution MEPC 107(49)**. The capacity throughput of the prototype should not be less than 5m^3/hr. The discharge pressure of the separated water (oil content <15ppm) shall not be more than 2kgf/cm^2 and less than 1.5kgf/cm^2.

21. The maximum oil content in the separated water which is discharged overboard should be **less than 15ppm as per MEPC 107(49) regulation** or the latest guidelines as promulgated by IMO. When oil content of the effluent exceeds 15 ppm, the plant should automatically stop discharging the treated water overboard and divert the

effluent to designated sullage/ dirt oil tank of the vessel. The plant should be capable of operating for at least 24hr of normal duty without attention.

22. The system should have a separate bilge pump capable of working satisfactorily at the max. suction lift of 1 MWC (Vacuum) and should be of self-priming type. The bilge pump would take the initial suction from bilge well and deliver to OWS plant. The bilge pump should deliver the emulsion as per the design pressure of the equipment. A secondary pump may be incorporated in the system based on the design study by Developing Agency (DA).

Dimensions and Weight

23. **Dimensions**. The $5m^3/hr$ capacity prototype should be of modular design to facilitate easy dismantling, shipping, unshipping. The overall dimension of the OWS plants shall not exceed the following limiting values:-

(a) Length – 2.4m

(b) Width/ Breath – 1.4m

(c) Height – 2m

24. **Weights**. The total weight of the equipment including all the mounted sub-assemblies shall not exceed 1200kgs (dry weight) and 2400kgs (wet weight) with 5% tolerance.

Function and Performance

25. **Bilge Alarm**. The design and function of Bilge alarm should comply with **IMO MEPC resolution 107(49)**. The bilge alarm system should be corrosion resistance in marine environment. The system should be provided with ppm display. The Bilge Alarm and ppm display should have accuracy within **± 5ppm**. The response time of the Bilge Alarm, that is, the time which elapses between an alterations in the sample being supplied to the Bilge Alarm and ppm display showing correct response, **shall not exceed 5sec**.

26. The Bilge Alarm should be designed to function effectively when the power supply varies by 10% and its accuracy is maintained despite the presence of contaminates other than oil such as rust, sand, mud, aeration etc. Bilge Alarm should record date, time and alarm status and operating status of the Bilge Water Separator. The recording device should store data for at least 18 months and should be able to display or print a protocol for official inspection as required. In the event of Bilge Alarm is replaced, means should be provided to ensure the data recorded remains available on board for 18 months. The bilge alarm should be fitted on a common base frame along with Oily Water Separator. The Bilge Alarm shall be designed such that is capable of automatic cleaning of measuring cell at the start and completion of each operation.

Control System and Monitoring

27. The control system shall be designed such that, when the Bilge Alarm detects that the oil content exceeds 15ppm, the effluent is diverted back to Bilge or Sullage tank and alarm is sounded. An automatically operated bypass valve controlled by Bilge Alarm and control system shall be fitted in the overboard discharge line. The layout of the installation shall be such that the overall response time (including the response time of Bilge Alarm) between an effluent discharge from the Bilge separator exceeding 15ppm and the operation of automatic stopping device/ by-pass valve preventing overboard discharge should be as short as possible and in any case not exceeding 20sec.

28. **Motors**. The motors will be selected conforming to **EED-Q-071 (R4)**. The DA shall be responsible to ensure completion of starter motor integrated trials and implementation of all required protections. The motor shall be provided with greasing inlet and outlet along with tally indicating type, quantity of grease and frequency of greasing. DA shall guarantee at least 40,000 working hours as the life of motor using shock pulse monitor. The motor shall have provision for pulse monitoring (SPM sockets/ nipples). The motors are to be manufactured for satisfactory performance under the following conditions and input supply characteristics /specifications.

Description	Value
Rated voltage	415V
No of phases	3 (Three) 3 wire supply system
Voltage Tolerance	
Steady state	± 0.5% at all load
Voltage range	15% to +10%
Recovery time	01 second
Frequency	
Nominal frequency	50Hz
Constant load tolerance	±0.5 Hz or ±1.0%
Load range tolerance	- ±1 Hz or ±2.0%
Transient	±2.5%
Time of recovery	2 Sec to within 1 % of transient
Frequency range	+/- 3%
Cooling	Air Cooled
Enclosure	• IP 55-Motors installed below deck • IP57-Motors installed on weather deck • IP 58-Submersible motors up-to 10mtrs. • IP 68- Submerged beyond 10 m.
Frequency at rated load	50Hz
Power factor	• 0.7 lagging up-to 5 KW • 0.8 lagging above 5 KW
Rating	Continuous rating
Efficiency class	Efficiency – 2 (improved efficiency)

Description	Value
	mentioned at table 1 to 4 of IS 12615: 2004
Insulation	Class 'F' or above

29. **Starters & Controllers**. All the starters & controllers provided will be as per **EED-Q-071(R4)**. Provisions for remote start/stop along with indications will be made as applicable. The control panel for various auxiliaries will incorporate necessary contactors control devices for efficient and sequential control of motors. As per guidance from Annexure-G of **EED-Q-071 (R4)**, starters shall be of following types depending of the rating of motors:

(a) DOL Starter with solid state motor protection devices for rating of motor upto and 10 KW.

(b) Star/Delta Starter with solid state motor protection devices for rating of motor above 10 KW.

Noise and Vibration Requirements

30. The following standards shall be adhered to in respect of Noise and Vibrations for all machinery during the performance evaluation and Type testing:-

(a) Equipment Vibration - ISO 10816-3.

(b) Airborne Noise (ABN) - MIL STD 1474E (in octave band).

(c) Structure Borne Noise (SBN) - MIL STD 740-2 (in one third octave band)

EMI/EMC.

31. All equipment/system being fitted onboard shall be compliant to **MIL STD-461 F**. All Test plan and reports shall be forwarded to Naval EMI/EMC Centre (NEC), Mumbai, for approval. All the standard procedures concerning EMC issues are to be as per **NECP-500**. COTS items, if any, are to be compliant to **IEC 60945** or **IEC 60533** or equivalent standards. Requirements of ground, bonding and shielding shall be as per **MIL-STD-1310HBU.**

32. The detailed Preliminary Statement of Technical Requirements is placed at **Appendix 'C'**.

PART III: CRITICAL TECHNOLOGY AREAS

33. The capability assessment of the DAs will largely depend on their ability to design the Marine Bilge Oily Water Separator including the Bilge Alarm System, all control system or acquire the design and technology with ToT from foreign OEMs. Incase, the technology is acquired from the foreign OEM, the firm should have the capability to undertake the design modification to suite Indian Navy and manufacture. It is imperative that the project attains complete independence in providing Indian Navy with Marine Bilge Oily Water Separator with high reliability, safety and assured shelf life of 20 years. **The contribution of the Indian industry in acquiring and developing technologies in critical areas, if any, shall be a key criterion in assessment of the proposal**.

34. The assessment of critical technologies for the Project Marine Bilge Oily Water Separator offered by the DA(s)/Consortium must be supported with all Rights and Licenses (IPR) as mentioned at **Appendix 'B'**.

PART IV: ELIGIBILITY CRITERIA

35. **Reservation for MSMEs**. The Project Marine Bilge Oily Water Separator is earmarked for MSMEs. However, if at least two MSMEs do not express interest for a Make programme earmarked for them, the same shall be opened up for all, under the condition that interested MSMEs, if any at that stage and meeting the eligibility criteria, will get preference over Non-MSMEs in selection of DAs in accordance with Para 12 of Chapter III of DAP-2020.

36. Indian entity satisfying all of the following criteria shall be considered as eligible 'Indian Vendor' for issue of EoI by PFT:-

(a) Public limited company, private limited company, partnership firms, limited liability partnership, one Person Company, sole proprietorship registered as per applicable Indian laws. In addition, such entity shall also possess or be in the process of acquiring a license as per DIPP's licensing policy.

(a) The entity has to be owned and controlled by resident Indian citizens. The entity with excess of 49% foreign investment will not be eligible to take part in 'Make' category of acquisition.

(b) The entity needs to be registered for minimum five years; three years in the case of MSMEs.

(c) The entity shall have long-term issuer credit rating equivalent to Credit Rating Information Services of India Limited (CRISIL) or ICRA Limited "BBB" accorded by Reserve Bank of India (RBI) / Securities Exchange Board of India (SEBI) approved agencies. In case of MSMEs, the minimum rating should be 'SME-4'. Rating report should not be older than 12 (twelve) months and be the latest available rating.

(d) The entity needs to be profitable for at least three out of the last five years; in case of MSME, it needs to be profitable (Profit after tax (PAT)) for at least one out of the last three years.

(e) **Net Worth**. Net worth of entities, ending 31st March of the previous financial year, should not be less than 1 crore.

37. Start-ups recognised by the DIPP are eligible for the project. Start-ups registered under the following categories and industry domains are eligible:-

(a) Categories.

(i) Engineering

(ii) Marine Engineering

(iii) Manufacturing

(iv) Government

(b) Industry Domains.

(i) Marine Engineering & Defence

(ii) Technology Hardware

38. This EoI is being published on MoD/DDP website inviting Companies to participate in the 'Make-II' project and also issued to the potential vendors who have indicated willingness during the Feasibility Study to participate in the development of Marine Bilge Oily Water Separator.

39. **Vendors are required to be compliant to Chapter III of DAP 2020 published on www.mod.gov.in**

PART V: ASSESSMENT PARAMETERS

40. The assessment of the EoI responses would be based on the Evaluation Criteria, which are elaborated in the succeeding paragraph.

41. **Technical Capability Criteria**. Marine Bilge Oily Water Separator is an equipment which will require sound knowledge of hardware technology, marine engineering, Oily water separation technologies, Defence Standards and global standards. The DA(s) should have a good understanding of Project Management, required for the development of Marine Bilge Oily Water Separator. The contribution of the DA in acquiring and developing technologies in critical areas shall be an important criterion in assessment of the proposal. The respondents to this EoI (including start-ups) are required to furnish information about their technical capabilities as per **Appendix 'G'**.

PART VI: EVALUATION CRITERIA OF ASSESSMENT PARAMETERS

42. **Evaluation Criteria for All Entities Other Than 'Start-Ups'**. The responses to this EoI will be evaluated based on the assessment parameters given at **Appendices 'D' to 'G'** to identify Companies/Consortia with proven Commercial, R&D, Indigenisation and Technical strengths and capabilities. The weightage for each of the criteria and sub-criteria at **Appendices 'D' to 'G'** would be finalised by the Project Facilitation Team.

43. **MoD, Govt of India reserves the right to modify these criteria at any time before the responses are opened for evaluation**. MoD, Govt of India also reserves the right to disqualify a respondent/consortium if he/they fail to comply with specific criteria at any stage of the evaluation process by the PFT. **No amendment/ change in response to EoI will be accepted under any circumstances once the EoI response is submitted**.

Note 1. Details regarding proposed expenditure/establishment of facilities/lab etc. are liable to be included in the contract in case the Company/ Consortium gets shortlisted for development of Marine Bilge Oily Water Separator.

Note 2. Company/Consortium giving False/Misleading information will be barred from participation in the Project Marine Bilge Oily Water Separator.

PART VII: DOCUMENTS TO BE SUBMITTED BY EoI RESPONDENTS

44. Following documents are required to be submitted by EoI respondents:-

(a) Annexure 1, 2 & 3 of Appendix 'A'.

(b) Appendix 'D' (Financial and Commercial Criteria)

(c) Appendix 'E' and 'F' (as applicable)

(d) Appendix 'G' (Technical Capability Criteria).

(e) Appendix 'H'

(f) Certificate as per Appendix 'J'.

(g) Documents in proof of Evaluation Criteria (i.e. Technical capability)

(j) MSME certificate, if claiming to be MSME. Start-ups are to submit their certificate in specified domain registered with DPITT.

45. The EoI respondents shall submit three (03) copies of response to EoI, clearly marking one copy as 'Original Copy' and the remaining two as 'Copy No 2 & 3'. The respondents are also required to submit a soft copy of the response to EoI in a CD/ DVD. In the event of any discrepancy between the content in copies of documents submitted, the contents in the 'Original Copy' shall govern/prevail. Each page of the response will bear the signatures of the authorised signatory of the Company/Lead Member in a Consortium.

46. **Guidelines for Submitting EoI Responses**.

(a) The responses should be submitted strictly as per the formats given in respective appendices along with Certificate at **Appendix 'J'**. Should a Vendor/Consortium need to mention any other information, a separate column may be added as the last column only.

(b) All response appendices should be submitted in a single file/folder. Supporting documents/additional reference should be submitted in a separate folder with proper reference mentioned against each parameters/sub parameters/sub sub parameters in respective appendices.

(c) Any supporting document/evidence without any reference to specific parameter of criteria will not form part of the assessment.

47. The envelopes shall be addresses as under:-

Chairman, PFT
Project Marine Bilge Oily Water Separator
Directorate of Marine Engineering
IHQ MoD (Navy)
Room 16, Sena Bhavan 'A' Wing
New Delhi 110001
Email: dme-navy@nic.in, Ph: 011-23010576

48. The response to this EoI must be submitted by ***1600*** hrs on ***30 Jul 2023*** at the address mentioned above.

49. MoD, Govt of India at its discretion can extend this deadline for the submission of responses to EoI and the same shall be notified in writing.

PART VIII: QUERIES AND CLARIFICATIONS

50. Following aspects will govern the procedure for queries and clarifications:-

(a) **Companies/Consortium may submit written queries/clarification/ amplifications on specific issues by *23 Jun 2023***. Consolidation and examination of the queries received will be carried out by the PFT and clarification will be given to all the industries during the pre-response meeting.

(b) **Pre-Response Meeting**. A pre-response meeting will be scheduled on ***05 Jul 2023*** at Directorate Marine Engineering, Room 130, Sena Bhavan 'A' Wing, New Delhi 110001 to clarify the issues/ queries raised to facilitate submission of response.

(c) If deemed necessary, a written reply may be given to all respondents after the meeting.

PART IX: MISCELLANEOUS

51. This EoI is being invited with no financial commitment on part of the Govt. of India/ MoD. Govt of India reserves the right to withdraw or change or vary any part thereof at any stage. MoD, Govt of India also reserves the right to disqualify any company should it be so necessary at any stage on grounds of national security.

52. Respondent/consortium would be disqualified if they make false, incorrect, or misleading claims in their response to this EoI. A certificate as per the format at **Appendix 'H'** would be furnished as part of the response, including respective consortium partners, where applicable.

Note. The above guidelines are to be read in conjunction with the guidelines under Chapter III of DAP 2020.

(Gagandeep S Sidhu)
Captain
Chairman, PFT
Project Marine Bilge Oily Water Separator

Enclosure:- Appendices 'A' to 'K'

Distribution: - Shortlisted vendors & hosted on MoD/DDP website

Appendix 'A'
(Refers to Para 7)

INDIGENOUS CONTENT ASPECTS

Definitions

1. 'Indigenous Content'(IC) for an equipment or an item shall be arrived at by excluding from the total cost of that equipment/item, the following elements at all stages (tiers) of manufacturing/production/assembly: -

(a) Direct costs (including freight/transportation and insurance) of all materials, components, sub-assemblies, assemblies and products imported into India.

(b) Direct and Indirect costs of all services obtained from non-Indian entities/ citizens.

(c) All license fees, royalties, technical fees and other fees/payments of this nature paid out of India, by whatever term/phrase referred to in contracts/agreements made by vendors/sub-vendors.

(d) Taxes, duties, cess, octroi and any other statutory levies in India of this nature.

2. The "on cost" basis for 'Buy (Indian IDDM)' shall imply that IC is required as specified under Para 8 & 21 of Chapter I of DAP 2020, read with additional specific requirements in this regard, if any, mentioned in the EoI/RFP. Further, the IC is required at base contract price i.e. total contract price less taxes and duties. In cases involving BNE, the cost of the BNE will be excluded from the base contract price for the purpose of calculating IC.

Computation of IC

3. IC as defined in Para 1 and 2 above shall be mandatorily reported by all stages (tiers) of manufacturing/ production/ assembly to their higher stages (tiers). All stages (tiers) are required to aggregate IC based on certifications and inputs from lower tiers, as well as on the basis of their own procurement actions and manufacturing activities undertaken. The final aggregation of IC shall be undertaken by the prime (main) contractor with whom an acquisition contract is signed by the Ministry/SHQ.

4. All contracts, sub-contracts, agreements and MoUs made by prime (main) contractors (and their lower tier suppliers/vendors) with their business partners/suppliers, insofar as these contracts, agreements or MoUs relate to the main acquisition contract, shall mandatorily incorporate the definition and reporting requirements for IC in terms of Para 3. Similarly, these business partners/suppliers shall sequentially incorporate these definitions and reporting requirements with their next levels of business partners/suppliers and so on, till the lowest tier in the manufacturing/production/assembly chain.

Verification

5. The Ministry of Defence can exercise its right to conduct an audit of all certifications and costs relevant to IC at all or any stages (tiers) of manufacturing/production/assembly, starting from the prime (main) contractor downwards. The audit(s) could be conducted by the Ministry itself and/or by an agency/institution/officer(s) nominated by the Ministry, as may be decided by the Ministry.

6. All contracts, sub-contracts, agreements and MoUs made by prime(main) contractors (and their lower tier suppliers/vendors) with their business partners/suppliers, insofar as these contracts, agreements or MoUs relate to the main acquisition contract, shall mandatorily incorporate the right of Ministry of Defence to conduct an audit in terms of Para 5. Similarly, these business partners/suppliers shall sequentially incorporate these definitions and reporting requirements with their next levels of business partners/suppliers and so on, till the lowest tier in the manufacturing/production/assembly chain.

Certification

7. All relevant deliveries made under contract shall be accompanied by a certificate of IC issued by the Chief Financial Officer (CFO). All final deliveries under contract shall be accompanied, in addition to the certificate issued by the CFO of the prime (main) contractor as aforesaid, by its Company Auditor's certificate. An Indigenisation Plan for Buy (Indian-IDDM) will be required to be submitted by the vendor to meet the requirement of IC as specified in Para 8 & 21 of Chapter I of DAP 2020. Further, the equipment offered for trial shall be accompanied with a certificate of IC issued by the CFO of the prime (main) bidder. The IC proforma as per **Annexure 2 to this Appendix** is to be enclosed. The format for certification of IC by the Statutory Auditor/ Company Auditor shall be as per **Annexure 2 to this Appendix**.

8. In case mandatory IC and design is not achieved by a vendor and/or if a false certificate is furnished by a vendor/sub-vendor, the Ministry can initiate proceedings for

banning or suspension of business dealings with the erring Indian vendor/sub-vendor and its allied firms for all future contracts for a period up to 5 years. This right can be exercised by the Ministry at any point of time; and initiation of banning or suspension proceedings, if ordered, shall be in addition to any other action that may be taken/ordered by the Ministry against the erring vendor/sub-vendor under any law(s) in force.

Miscellaneous

9. In the event of non-incorporation of the definitions and/or audit requirements laid down under Para 1 to 6 in contracts or agreements vendors with next tier at any stage (tier) of manufacturing/production/assembly, it shall be presumed that items/services provided by that stage/tier to the next (tier) have no IC for the purposes of the DPP. Similarly, in the event of non-certification of IC at any stage (tier) as required herein, it shall be presumed that items/services provided by that stage/tier to the next stage (tier) have no IC for the purposes of the DPP. In such cases, the Ministry of Defence can take any of the steps under Para 8 above against erring vendors/sub-vendors. In addition, an undertaking as per **Annexure 3 to this Appendix** is to be submitted by the firm.

Annexure 1 to Appendix 'A'
(Refers to Para 7)

INDIGENOUS CONTENT (IC) PROFORMA

Name of the Project / Contract Details						
Ser	**Description**	**(In USD)**	**(In EURO)**	**(In GBP)**	**(.....)**	**Total (Rs)**
1.	**Foreign Content (FC) including Custom Duties**					
	-Basic Equipment and Material (by Prime Vendor and Tiers Vendors, as applicable)					
	-Manufacturer's Recommended List of Spares (MRLS) (by Prime Vendor and Tiers Vendors, as applicable)					
	-Special Maintenance Tools (SMT) (by Prime Vendor and Tiers Vendors, as applicable)					
	-Special Test Equipment (STE)(by Prime Vendor and Tiers Vendors, as applicable)					
	-Freight / Transportation & Insurance (if paid by supplier)					
	By 'Others' (@ 90% FC)					
	Sub Total (A)					
2.	**Import of Services**					
	-Royalty Fee					
	-Licence Fee if any					
	-Technical know-how fee					
	-Consultation fees					
	-Other fees/payment					
	Sub Total (B)					
	FC = (A+B)					

Computation of Indigenous Content			
3.	Base Exchange Rate (D)		
4.	FC in INR E=(FC x D)		
5.	Base Contract Price (F)		
6.	Indigenous Content G = (F – E)		
	Indigenous Content (%) G x100 / F		

Notes.

(a) Base Exchange Rate will be Selling Rate of Parliament Street Branch of State Bank of India, New Delhi as on the last date of submission of bid.

(b) Consolidated IC Proforma/ Certificate of Prime Vendor and applicable Tiers vendors will be maintained by Prime Vendor and made available on demand for verification by MoD.

(c) IC Proforma / Certificate are to be submitted along with or before the final invoice of the contract. At all prior stages the Prime Vendor shall submit an undertaking of compliance.

Annexure 2 to Appendix 'A'
(Refers to Para 7)

FORMAT FOR CERTIFICATION OF INDIGENOUS CONTENT
VENDOR'S CERTIFICATE

This is to certify that we, _____ (Name of Prime Vendor/Tier Vendor) have achieved/are offering the following IC in the accompanying delivery under contract/equipment being offered for trials/prototype/delivery, as defined under the Defence Acquisition Procedure and as required under the RFP/Contract (tick whichever is applicable) No. _____ dated _____.

Signed by:

'Responsible Designated Official'
---------- (Name of Vendor)

Seal of Vendor
Date:

AUDITOR'S CERTIFICATE

We (legal name of Verification Firm) _____, established in _____ (Full address) represented for signature of this Verification Certificate by (Name and designation of Authorised Representative), hereby certify that: -

The above mentioned Indigenous Content (IC) performa has been examined and all checks of the supporting documentation and accounting records deemed necessary were carried out in order to obtain reasonable assurance that, in our opinion, based on our Verification, the Indigenous Content percentage _____ % (in numbers and words) reflected in the above mentioned performa has been achieved by _____ (Name of Vendor) during the manufacture of _____ (Name of Equipment).

Certified by:

Statutory Auditor/ Cost Auditor/Certified or
Licensed Cost Accountant / Chartered Accountant
(as applicable)
(Name /Name of Firm)
Membership Number / Registration Number

Seal of Verification Firm

Date:

Annexure 3 to Appendix 'A'
(Refers to Para 7)

UNDERTAKING TO COMPLY WITH INDIGENOUS DESIGN

We, _____ ("Name of Vendor"), do hereby certify and confirm that: -

1. The Design of _____ ("Named Product"), as claimed by us in response to the RFP No _____ dated _____ is owned partly or wholly by us/by an Indian entity.

2. Further, we confirm that the Design of the Named Product, as claimed by us, has not been licensed from a foreign third party except for standard software licences such as, but not limited to OS / Database / _____ (Strikeout / Specify as applicable).

3. The ownership of the Design, as claimed by us, enables us to manufacture, realise, sell, provide Through Life Support, modify and upgrade the Named Product without any encumbrances, except as specified below: (If any form of encumbrances exist on the product or any of its subsystems these should be elaborated here) _____
_____

4. We further claim that we own the following Intellectual Property (IP) Rights in relation to the design of the Named Product: (Specify any Patents, Registration of Designs, if any, held by the Vendor)_____
_____

5. We also undertake to permit MoD/MoD appointed Specialists Committee, to inspect/ carry out technical verification at our premises of the applicable documents, such as Design Reports, Drawings, Specifications, Software Documents & Codes, Gerber files, etc, as may be reasonably necessary and required to prove the above claim of ownership of the Design of the Named Product. (Examination on site at company's premises only. Documents, in any form, are not be sought nor required to be submitted for examination outside the Company's premises)

6. Failure on our part to prove the ownership of the Design of the Named Product by us/by an Indian entity or submission of any false undertaking or claim as indicated in the response at any post contract stage of the intended procurement may make us liable to forfeiture of the PWBG to the extent of any direct losses or damages suffered by the MoD

as a consequence of such false undertaking or failure to prove the ownership of the Design.

Appendix 'B'
(Refers to Para 9 and 33)

INTELLECTUAL PROPERTY RIGHTS OF GOVERNMENT IN 'MAKE II' PROJECTS

Guiding Principles

1. The Government shall retain only a license in the Intellectual Property being generated under contract; and the contractor retains title or ownership and all other rights in intellectual property that are not granted to the Government, subject to conditions prescribed herein.

2. During the development of prototype, if any technology/product is developed, which the Government considers to be sensitive or classified and needs to be restricted for use in other purposes or for export, the Government through PFT or any other expert or body may identify such technology/product and shall retain the full ownership of IPRs in respect of such technology/product.

3. All technology licensing is divided up between two mutually exclusive categories of deliverables: (a) Technical Data (TD)[1] and (b) Computer Software (CS)[2]. The Government shall also have certain rights to subject inventions and patents generated under the 'Make' contract.

4. The EoI shall contain details of (a) the delivery requirements, storage formats and storage medium; and (b) the associated data rights, in all technologies required to be developed or delivered under the 'Make' contract. Officials connected with award of 'Make' projects shall ensure that all such delivery requirements are clearly stated in the

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[1]'Technical data' means recorded information, regardless of the form or method of the recording, of a scientific or technical nature (including computer software documentation). The term does not include computer software or data incidental to contract administration, such as financial and/or management information.

[2](a)'Computer software' means computer programs, source code, source code listings, object code listings, design details algorithms, processes, flow charts, formulae and related material that would enable the software to be reproduced, recreated or recompiled. Computer software does not include computer data bases or computer software documentation. (b) 'Computer program' means a set of instructions, rules, or routines recorded in a form that is capable of causing a computer to perform a specific operation or series of operations. (c) 'Computer software documentation' means owner's manuals, user's manuals, installation instructions, operating instructions, and other similar items, regardless of storage medium, that explain the capabilities of the computer software or provide instructions for using the software. (d) 'Computer data base' means a collection of data recorded in a form capable of being processed by a computer. The term does not include computer software.

EoI and the 'Make' contract signed, if any, including delivery and form in which source code is required as a contract deliverable.

5. The Government's standard license rights in (a) subject inventions and associated data; and (b) all other data generated under the 'Make' contract, including technical data and computer software whether associated with such subject inventions or otherwise, shall be 'Government-Purpose Rights' (GPR). In respect of subject inventions, the Government shall hold a non-exclusive, non-transferable, irrevocable, paid up (royalty-free) license to practice, or have practiced for on its behalf, the subject invention throughout the world.

6. These guiding principles shall apply at both the prime and subcontract levels; i.e., the prime DA(s) shall incorporate the rights of the Government as prescribed in this Annexure in all their subsequent sub-contracts and agreements insofar as technology development under 'Make' projects is concerned.

Government Rights

7. The Government shall have 'Government-Purpose Rights' and 'Unlimited Rights' as explained below:-

8. For all subject inventions[3] under the 'Make' contract, including technical data and computer software associated with such subject inventions, the Government shall hold GPRs, in that it shall hold a non-exclusive, non-transferable, irrevocable, paid up(royalty-free) license to practice, or have practiced for on its behalf, the subject invention throughout the world. These GPRs shall automatically convert to 'Unlimited Rights' as defined under this section upon the expiry of ten years.

9. For the purpose of all technical data and computer software, whether related to subject inventions or otherwise, GPRs shall imply the right to use such technical data and computer software within the Government without restriction and the right to authorise any other entity for any government purpose including re-procurement. More specifically, GPRs include the rights to:-

(a) Use, modify, reproduce, release, perform, display, or disclose technical data within the Government without restriction; and

[3]'Subject Invention' implies any invention of the contractor conceived or first actually reduced to practice in the performance of work under a Government Contract. 'Invention' implies any invention or discovery that is or may be patentable or otherwise protectable under the Patent Laws in force in India.

(b) Release or disclose technical data outside the Government and authorise persons to whom release or disclosure has been made to use, modify, reproduce, release, perform, display, or disclose that data for Government purposes.

(c) Form, Fit and Function data: and Manuals or instructional and training materials for installation, operation, or routine maintenance and repair;

(d) Computer software documentation required to be delivered under the 'Make' contract;

(e) Corrections or changes to computer software or computer software documentation furnished to the contractor by the Government;

(f) Computer software or computer software documentation that is otherwise publicly available or has been released or disclosed by the contractor or subcontractor without restrictions on further use, release or disclosure other than a release or disclosure resulting from the sale, transfer, or other assignment of interest in the software to another party or the sale or transfer of some or all of a business entity or its assets to another party;

10. For the purposes of these guidelines, 'Government Purpose' means an activity in which the Government of India is a party, including cooperative agreements with international or multinational Defence organisations, or sales or transfers by the Government of India to foreign Government or international organisations. Government purposes include competitive procurement, but do not include the rights to use, modify, reproduce, release, perform, display, or disclose technical data for commercial purposes or authorise others to do so.

11. In addition to standard GPRs, Government rights in computer software to be delivered under contract shall also include the right to:-

(a) Use of a computer program with Government computer(s);

(b) Transfer to another Government computer;

(c) Make copies of computer software for safekeeping; backup or modification purposes;

(d) Modify computer software;

(e) Disclose to service contractors;

(f) Permit service contractors to use computer software to diagnose/correct deficiencies, or to modify to respond to urgent or tactical situations; and

(g) Disclose to contractors or any other third-parties for proposes of emergency repair and overhaul.

March-In Rights

12. The Government shall have 'March-In' rights for all items covered under its 'Government-Purpose Rights'. 'March-In' Rights shall include the right to work the patent, either by itself, or by another entity on behalf of the Government, in case the contractor fails to work the patent on its own within a specified and reasonable period of time.

13. Under its march-in rights, the Government can require the contractor to grant, or may itself grant license for, inter alia, the following reasons:-

(a) The contractor fails to work the patent towards practical application within a reasonable time; or

(b) Where health and safety requirements so require the Government to act in public interest;

(c) For National Security Reasons;

(d) To meet requirements for public use not reasonably satisfied by the contractor;

(e) For failure of the contractor to substantially manufacture the products embodying the subject invention in India; or

(f) For failure of the contractor to comply with any of the requirements laid down under these guidelines.

Miscellaneous

14. The contractor is required to have a timely and efficient disclosure system in place for reporting of intellectual property generation under the 'Make' contract to the Ministry of Defence. Failure to disclose in timely manner, or failure on part of the contractor to invoke his/her default right of ownership, shall imply that all IPRs shall ab-initio vest in the

Government of India. The contractor may elect to retain title of any invention made in the performance of work under a contract. If the contractor does not elect to retain title, the title shall ab-initio vest in the Government as stated above and the contractor shall only be entitled to a license on such terms and conditions that the Government may deem it fit. Such license to the contractor shall usually be (a) revocable, non-exclusive and royalty-free; (b) extend to its domestic subsidiaries and affiliates; and (c) include the right to sublicense; but (d) shall not be transferable without prior approval of the Government.

15. The contractor shall also be required to submit periodic reports about commercialization and manufacturing activities undertaken for products embodying the subject invention under 'Make' contracts.

16. The Government's IPRs shall flow down from the prime contractor to all sub-contractors at all tiers; that is, every sub-contractor will have the same obligations vis-à-vis the Government as applicable to the prime contractor under the main procurement contract. To this end, the subcontractors shall have limited contractual privity with the Government solely for the purposes of their IPR obligations to the Government.

17. The ownership of any rights by the contractor does not include an absolute right to transfer of any software, product or documentation; and such transfer, including export thereof, shall continue to be governed by and be subject to the Export Policy, Export Guidelines and all applicable laws, rules, regulations, orders and instructions of the Government of India. All such transfers and exports shall require prior and explicit approval of the Ministry of Defence.

18. Where the DA is not a consortium, ownership rights in intellectual property (IP) being generated under the 'Make' contract shall vest with the Government upon dissolution of such DA. Where the DA is a consortium, the ownership rights in the IP generated under the 'Make' contract, upon dissolution of the consortium, shall vest amongst the partners as per their agreement on the subject contained in the joint partnership agreement of the consortium, without government rights as licensee being adversely affected in any manner.

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Appendix C
(Refu Para 32)

This document contains a total of 18 pages Including cover page. The contents are not To be disclosed to any unauthorized person.

PRELIMINARY STATEMENT OF TECHNICAL REQUIREMENT FOR INDIGENOUS DESIGN AND DEVELOPMENT OF 5M3/H OILY WATER SEPERATOR

1. Sponsor	:	DTE OF MARINE ENGINEEING
2. Reference	:	EG/2508/MAKE-II/OWS
3. Type of Qualitative Requirement	:	PSQRs
4. Other Staff Requirement	:	NIL
5. Nomenclature	:	PSQR FOR INDIGENOUS DESIGN AND DEVELOPEMNT OF 5M^3/H OILY WATER SEPERATOR
6. Security Classification	:	UNCLAS
7. Priority	:	IMMEDIATE
8. No. of pages	:	18

(BAJAY)
Commodore
Cmde (Marine Engg)

Date 03 Oct 22

ABBREVIATIONS

Ser	Abbreviation	Full Form
1.	ABN	AIR BORNE NOISE
2.	DA	DEVELOPING AGENCY
3.	DEFSTAN	DEFENCE STANDARD
4.	DPA	DETAILED PROJECT REPORT
5.	DQA	DIRECTORATE OF QUALITY ASSURANCE
6.	EMC	ELECTRO MAGNETIC COMPATABILITY
7.	EMI	ELECTRO MAGNETIC INTERFERENCE
8.	IPMS	INTEGRATED PLATFORM MANAGEMENT SYSTEM
9.	LFH	LIMITED FIRE HAZARD
10.	MIL-STD	MILLITARY STANDARD
11.	NECP	NAVAL EMC CENTRE PUBLICATION
12.	NES	NAVAL ENGINEERING STANDARD
13.	OEM	ORIGINAL EQUIPMENT MANUFACTURER
14.	PDR	PRLEIMINARY DESIGN REVIEW
15.	PFT	PROJECT FACILITATION TEAM
16.	QAD	QUALITY ASSURANCE DOCUMENT
17.	QAP	QUALITY ASSURANCE PROCEDURE
18.	SBN	STRUCTURE BORNE NOISE
19.	STW	SETTING TO WORK
20.	SV MOUNTS	SHOCK AND VIBRATION MOUNTS

CHAPTER 1 - INTRODUCTION

1. The scope of the PSQR is for Indigenous Design & Development of Oily Water Separator of capacity 5m^3/hr. The design of the OWS plant should confirm as per the as per requirements of **DEFSTAN 02-322** and **MEPC 107(49)**. The complete designing and manufacture of the prototype **(Qty 02)** will be overviewed by the Project Facilitation Team (PFT).

2. **Applicable Standards**. The equipment should adhere to DEF STAN 02-322 and latest IMO resolution. The following documentation or their latest issues in effect is to form a part of this specification to the extent specified herein, except where a specific issue is indicated.

Ser	Standard	Title
(a)	DEF STAN 02-322	Oil and Bilge Water Shipboard Processing Arrangement.
(b)	IMO Resolution MEPC 107(49)	Guidelines and Specifications for Pollution Prevention Equipment for Machinery Spaces Bilge of Ships.
(c)	NES 717	Requirement of Bilge, Sullage and Drain Tank systems for Surface ship.
(d)	ISO 10816	Mechanical vibrations of Shipboard equipment.
(e)	MIL-STD-167	Mechanical vibrations of Shipboard equipment.
(f)	MIL-STD-740-2	Airborne and Structure borne Noise measurements and acceptance criteria of shipboard Equipment.
(g)	NES 1004	Design and Testing of Equipment to meet Environmental Conditions.
(h)	DME Specs 452	Documentation specifications.
(j)	DME Specs 465	Centrifugal Pumps
(k)	DME 303D	Guidelines for acceptance trials of main and auxiliary machinery of new construction ships (Indian Navy guidelines).
(l)	DEF STAN 02-723	Tally/diagram plates.
(m)	DME Specs 405 (Rev-1)	Instrumentation specifications.
(n)	DME Specs 411	Specifications for RTDs and Thermocouples.
(p)	DME Specs 424	Specifications for Electrical Indicators
(q)	DEF STAN 02-360 & DME Spec 463	Specification on manually operated ship system valves for low pressure fluids
(r)	DEF STAN 02-302	Requirements for maintenance envelopes and removal routes
(s)	DGS 251	Painting
(t)	JSS-55555	Environmental Test
(u)	MIL-DTL-87268D MIL-DTL-87269D	Interactive Electronic Technical Manuals.

Ser	Standard	Title
	JSG 0852:2001	
(v)	EED-Q-071 (Revision 4)	Specifications for Motors and Starters for Naval ships (Indian Navy specifications).
(w)	MIL-1474-E	Air borne sound measurements and acceptance criteria of shipboard equipment.
(x)	MIL-STD-461F	Requirements for control of electromagnetic interference characteristics of sub systems and equipment.
(y)	MIL-M-7298C	Technical Manuals
(ab)	IEC 60529	IP Code
(ac)	DME 511	Specifications for Gaskets.

3. **Deliverables**. The procurement on 30 OWS plants post successful performance evaluation of prototype, shall include deliverable like Local Control Panel (LCP), shock mounts, Onboard Spares (OBS), special tools, documentation, training and technical services for installation. The specific requirement wrt supply of documentation, training, ODS & B&D spares, preservation & de-preservation, packing, technical services (STW, commissioning, HATs, SATs, AMC), special tools for maintenance, control interface with IPMS will be specified in the SQRs

CHAPTER – TWO

ESSENTIAL PARAMETERS

1. **Environmental Conditions**. The equipment are to be designed for environmental conditions as specified in **NES 1004 and MEPC 107(49) resolution** as tabulated below:-

Description	Value
Ambient Air Temperature	0 °C to Max 45 °C (Dry Bulb)
Max Compartment air temperature	Upto 55 °C
Max Relative Humidity	90% at 35 °C
Max Ambient Sea Water Temperature	Upto 35 °C
Salinity of Sea Water	36000 ppm
Vibration, including vibration during motion or weapon operations	IAW ISO 10816-3
Structure Borne Noise (SBN)	MIL-STD-740-2 (in one third octave band)
Air Borne Noise (ABN)	MIL-STD-1474-E (in octave band)
Dust/Dirt	IP 58
Electrical, Magnetic and Electro-magnetic	Compliant to MIL STD 461 E/F
Roll	Max ±30° with 10 sec period
Pitch	Max ±10deg with 20s period
Trim	Max 5°
List	Max 20° from vertical

Design Requirements

2. Design. The prototype being developed as part of Indigenous Design and Development of Oily Bilge Water Separator should comply with the design specifications as per **DEF STAN 02-322** and **IMO resolution MEPC 107(49)**. The capacity throughput of the prototype should not be less than $5m^3/hr$. The discharge pressure of the separated water (oil content <15ppm) shall not be more than $2kgf/cm^2$ and less than $1.5kgf/cm^2$.

3. The maximum oil content in the separated water which is discharged overboard should be **less than 15ppm as per MEPC 107(49) regulation** or the latest guidelines as promulgated by IMO. When oil content of the effluent exceeds 15 ppm, the plant should automatically stop discharging the treated water overboard and divert the effluent to designated sullage/ dirt oil tank of the vessel. The plant should be capable of operating for at least 24hr of normal duty without attention.

4. The system should have a separate bilge pump capable of working satisfactorily at the max. suction lift of 1 MWC (Vacuum) and should be of self-priming type. The bilge pump would take the initial suction from bilge well and deliver to OWS plant. The bilge pump should deliver the emulsion as per the design pressure of the equipment. A secondary pump may be incorporated in the system based on the design study by Developing Agency (DA).

Dimensions and Weight

5. **Dimensions**. The 5m³/hr capacity prototype should be of modular design to facilitate easy dismantling, shipping, unshipping. The overall dimension of the OWS plants shall not exceed the following limiting values:-

(a) Length – 2.4m

(b) Width/ Breath – 1.4m

(c) Height – 2m

6. **Weights**. The total weight of the equipment including all the mounted sub-assemblies shall not exceed 1200kgs (dry weight) and 2400kgs (wet weight) with 5% tolerance.

Function and Performance

7. **Bilge Alarm**. The design and function of Bilge alarm should comply with **IMO MEPC resolution 107(49)**. The bilge alarm system should be corrosion resistance in marine environment. The system should be provided with ppm display. The Bilge Alarm and ppm display should have accuracy within **± 5ppm**. The response time of the Bilge Alarm, that is, the time which elapses between an alterations in the sample being supplied to the Bilge Alarm and ppm display showing correct response, **shall not exceed 5sec**.

8. The Bilge Alarm should be designed to function effectively when the power supply varies by 10% and its accuracy is maintained despite the presence of contaminates other than oil such as rust, sand, mud, aeration etc. Bilge Alarm should record date, time and alarm status and operating status of the Bilge Water Separator. The recording device should store data for at least 18 months and should be able to display or print a protocol for official inspection as required. In the event of Bilge Alarm is replaced, means should be provided to ensure the data recorded remains available on board for 18 months. The bilge alarm should be fitted on a common base frame along with Oily Water Separator. The Bilge Alarm shall be designed such that is capable of automatic cleaning of measuring cell at the start and completion of each operation.

Control System and Monitoring

9. The control system shall be designed such that, when the Bilge Alarm detects that the oil content exceeds 15ppm, the effluent is diverted back to Bilge or Sullage tank and alarm is sounded. An automatically operated bypass valve controlled by Bilge Alarm and control system shall be fitted in the overboard discharge line. The layout of the installation shall be such that the overall response time (including the response time of Bilge Alarm) between an effluent discharge from the Bilge separator exceeding 15ppm and the operation of automatic stopping device/ by-pass valve preventing overboard discharge should be as short as possible and in any case not exceeding 20sec.

10. All Bourdon tube pressure gauges are to be selected from the range specified in DME 405 (R1) and electrical indicators should be selected from the range specified in DME 424. All the instrumentations should have calibration certification from NABL accredited labs and same to the submitted to the PFT during Performance evaluation.

11. Failure of one or more of the gauges shall not make the equipment/ system non-operational. Scale of the instrumentations should be such that, maximum pressure will approximately 75% of the full-scale range. Indication of plant running status should be provided on the control panel. Control panel should indicate trips which has caused shutdown of the equipment. The pump starter shall be located adjacent to the pump's local instrumentation so that the operator.

12. **Indications, Alarms, Trips**. The minimum indication, alarm and trips are to be provided are listed below. The Developing Agency can provide additional indication, alarm and trips as deemed necessary while designing the plant: -

Indications

(a) Power on.

(b) OWS running.

(c) Oil Content Monitor Display.

(d) Pump suction and discharge analogue pressure gauges.

Alarm

(a) High Oil Content (15 ppm).

(b) Filter clogged.

Trip

(a) Filter clogging trip.

(b) Motor protection trip.

(c) Pump dry run trip.

(d) Low bilge level trip.

13. **Local Control Panel (LCP).** The Technical parameters of Local Control Panel to confirm to **EED-Q-071 (R4)**. The LCP should have a provision for starting, stopping, controlling and monitoring of the OWS. Indication of plant running status and parameters, alarms, trips as applicable are to be available in the LCP. The logic of the control system should be clearly displayed on the OWS. The LCP should be provided with adequate ventilation system to avoid overheating of the PLC and microprocessor

14. The LCP must be provided with instruction plates for start/stop procedure. All control panels must be provided with necessary mounts to meet the required shock and vibration requirements. The design of the OWS shall incorporate mounting of the LCP on same skid of main equipment.

15. **Modularity of LCP**. The system will be required to cover a range of process modules, which should seamlessly integrate into the core system. Each module in the package should be installable and operable as a complete application within itself, on a stand-alone or / and small network systems. The system design should be such that no other software would be required to run any module independently. This is an over-riding requirement over any other condition / requirement. As the application would be utilised by ships of different classes / equipment, each module would be required to be scalable within itself. This would imply that the functionalities built in each module should be customisable by the user end to select and scale the functionalities as per the plant requirement.

16. **Control system** should consist of following inputs and outputs modules:-

(a) All analog control signals – 4 - 20m Amps.

(b) RTD signal shall be PT 100, three wire.

(c) Potentiometer shall be excited by all external voltage sources.

(d) All binary indication signals shall be dry contact type.

(e) All binary contact inputs shall be compatible with switches and the signal from the control system.

(f) Manual/hardwired Interface.

17. **Wiring**. Wiring of all sensors, including terminal box with connecting cables, compensating cables, connectors and transmitter block for pressure measurement, temperature etc. and its connection in Terminal Box and transmitter block is to be done by OEM. Internal wiring to be done with LFH cable. Cable Glands conforming to **BS 6121/ EN 624440-2013** are to be provided. Cables specification as per European marine class and cable connector pins shall be gold plated and conform to **MIL-C-22992 / MIL-C-26500 / MIL-DTL-5015**.

18. **Motors**. The motors will be selected conforming to **EED-Q-071 (R4)**. The DA shall be responsible to ensure completion of starter motor integrated trials and implementation of all required protections. The motor shall be provided with greasing inlet and outlet along with tally indicating type, quantity of grease and frequency of greasing. DA shall guarantee at least 40,000 working hours as the life of motor using shock pulse monitor. The motor shall have provision for pulse monitoring (SPM sockets/ nipples). The motors are to be manufactured for satisfactory performance under the following conditions and input supply characteristics /specifications.

Description	Value
Rated voltage	415V
No of phases	3 (Three) 3 wire supply system
Voltage Tolerance	
Steady state	± 0.5% at all load
Voltage range	15% to +10%
Recovery time	01 second
Frequency	
Nominal frequency	50Hz
Constant load tolerance	±0.5 Hz or ±1.0%
Load range tolerance	- ±1 Hz or ±2.0%
Transient	±2.5%
Time of recovery	2 Sec to within 1 % of transient
Frequency range	+/- 3%
Cooling	Air Cooled
Enclosure	• IP 55-Motors installed below deck • IP57-Motors installed on weather deck • IP 58-Submersible motors up-to 10mtrs. • IP 68- Submerged beyond 10 m.
Frequency at rated load	50Hz
Power factor	• 0.7 lagging up-to 5 KW • 0.8 lagging above 5 KW
Rating	Continuous rating
Efficiency class	Efficiency – 2 (improved efficiency) mentioned at table 1 to 4 of IS 12615: 2004
Insulation	Class 'F' or above

19. **Starters & Controllers**. All the starters & controllers provided will be as per **EED-Q-071(R4)**. Provisions for remote start/stop along with indications will be made as applicable. The control panel for various auxiliaries will incorporate necessary contactors control devices for efficient and sequential control of motors. As per guidance from Annexure-G of **EED-Q-071 (R4)**, starters shall be of following types depending of the rating of motors:

(a) DOL Starter with solid state motor protection devices for rating of motor upto and 10 KW.

(b) Star/Delta Starter with solid state motor protection devices for rating of motor above 10 KW.

20. **Interface Definition**. For all the OWS plants which shall be supplied as part of bulk procurement, the DA shall provide all information required for integration of the control system with ship's IPMS.

21. **Modes of Operation**. The OWS shall be operated from local control panel.

22. **Manning Policy**. The machinery should be able to be started, monitored & stopped from local position. Additionally, the control system should be designed to provide following signals for remote monitoring through IPMS:-

(a) OWS Running.

(b) PPM display reading.

(c) Fault Indication.

23. **POL**. OEM is to use only indigenous grease.

Material Specification

24. The materials used for the construction of OWS, pumps, piping systems, etc. shall confirm for marine application iaw **DEF STAN 02-322** and **MEPC 107(49) resolution**. The component wise material specification list is to be provided by the DA to the PFT. Only material which are approved for use onboard naval ships are only to be used. Any deviation shall be intimated with reasons to the PFT.

25. All pipes shall be provided with flexible bellows and counter flanges complete with bolts, nuts and gaskets for connecting onboard piping system. Unions shall be provided, for screwed connections. Gaskets are to be iaw **DME 511**. Metallic Protective conduit for electric cables on OWS shall be provided of fire resistant grade.

26. Marine Standard painting system shall be applicable as appropriate, in accordance with **DGS 251**. All items to be painted shall be cleaned, degreased and painted with two coats of anticorrosive Marine Paint & two finish coats. DA has to provide the details of paint used, such as primer, commercial name and details of the paint, number of coats, periodicity for painting etc to PFT.

Operation Cycle, Operational Life.

27. The intended life of the equipment between major overhauls/ top overhaul should not be less than 5yrs. The total expected service life from first fit to final disposal of last equipment shall not be less than 15 years considering the ops cum refit cycle of the ship. The equipment should shall be capable of operating for atleast 24hrs of normal duty without any intervention by watch keeper.

Noise and Vibration Requirements

28. The following standards shall be adhered to in respect of Noise and Vibrations for all machinery during the performance evaluation and Type testing:-

(a) Equipment Vibration - ISO 10816-3.

(b) Airborne Noise (ABN) - MIL STD 1474E (in octave band).

(c) Structure Borne Noise (SBN) - MIL STD 740-2 (in one third octave band)

29. **Equipment Vibration**. The overall vibration of the equipment should qualify to vibration limitation as per Classification of machine, Group 3 with flexible support iaw ISO 10816-3. The limiting value of the vibrations should be 3.5mm/s (RMS velocity)

30. **Structure Borne Noise (SBN)**. The measurement and acceptance criteria shall be as per Type II category of equipment iaw MIL STD 740-2. The graph of the 1/3 Octave band frequency range is placed at **Appendix A**. SBN of the OWS when measured on top of the 1st stage mounts (if multi stage mounts are being used).

31. **Airborne Noise Level (ABN)**. The measurement and acceptance criteria shall be as per Grade D equipment of MIL STD 1474E/ MIL STD 740-1(SH) (**Refer Appendix B**) when measured at the octave bands, without acoustic enclosure.

32. The OWS prototype design shall include AV & Shock mounts to comply with the noise and vibration requirements as stipulated above. Free height with tolerance & maximum deflection with tolerance, maximum load bearing capacity, rubber material, shore hardness value, make & type of mount to be clearly specified in binding drawing along with footprint drawing should be submitted for approval prior performance evaluation. The SV mounts cannot be considered for achieving the stipulated SBN values and hence the SBN are to be recorded above the mounts. The ABN requirements iaw MIL STD 1474E should be met, when measured without acoustic enclosure.

EMI/EMC.

33. All equipment/system being fitted onboard shall be compliant to **MIL STD-461** F. All Test plan and reports shall be forwarded to Naval EMI/EMC Centre (NEC), Mumbai, for approval. All the standard procedures concerning EMC issues are to be as per **NECP-500**. COTS items, if any, are to be compliant to **IEC 60945** or **IEC 60533** or equivalent standards. Requirements of ground, bonding and shielding shall be as per **MIL-STD-1310H**.

Details of SV mounts.

34. **Criteria for Mounts Selection**. The equipment should be mounted on suitable mounts. The following criteria shall be followed whilst selecting mounts and integration of the machinery with foundation:-

(a) **Resonance Criteria**. During selection of mounts, it is to be ensured that none of the natural vibration mode frequencies of the assembled system must match the excitation frequencies generated during machinery operation. As a factor of safety, the highest of the vertical natural frequencies must at least be lower than 1/4th of the lowest forcing frequency. Loaded mounts frequency (f_n) and lowest forcing frequency (f_d) must fulfil the criteria $f_d/f_n \geq 4$.

(b) **Service and Shelf Life**. The mounts selected should have atleast 05 years of shelf life & 15 years of service life.

(c) **Attenuation Criteria**. Vibration Trials to be undertaken with reference of **ISO 10816** and **MIL-STD-167-1A**. Further, overall mechanical vibrations to be taken above and below mounts to measure attenuation across the mounts. The attenuation achieved by the mounts should be within 70-90 %. Attenuation values above 90% would be considered acceptable subject to the vibration and performance parameters within the prescribed limits.

(d) **Foundation consideration and Uniform loading of Mounts**. The least of the natural frequencies of the foundation should be greater than 25 Hz and all the natural frequencies of the foundation should not fall within (+/-) 0.4 times of excitation/forcing frequencies of the system. Further, it is to be ensured that all similar mounts are loaded equally (within 10 % of mean load on each mount) and load on each mount should be 70% to 90% of rated capacity.

(e) The OEM should target Spectrum attenuation during initial stage which implies that expected characteristic frequencies of a machine is to be targeted for attenuation whilst selecting mounts for attenuation of vibrations.

(f) The DA will indicate grouping details of the AV mounts along with dynamic stiffness, deflection and attenuation values across the mounts. SV reports of the mount characteristics (to be within acceptable limits) along with serial numbers are to be provided. The surface finish of the pad plates for installation of SV mounts is to be provided by DA as required by the mount OEM.

35. **Testing and Acceptance of Mounts.**

(a) Natural frequency tests on assembly to determine efficacy of design calculations are to be performed by specialist agencies. Corrections, if any, are to be undertaken by OEM/Shipyard.

(b) Type Testing of shock and vibration characteristic of a mount being introduced / replaced is to be undertaken. Testing characteristic to include deflection, shock attenuation and vibration attenuation (at base excitation

frequency) as applicable from case to case. Additional tests may be undertaken to ascertain the suitability of mount.

(c) Grouping test is to be carried out on mounts prior fitment onboard.

(d) The testing installation at DA premises during performance evaluation shall be identical to the foundation/ mounting arrangements being provided for subsequent bulk procurement. Guidelines to be considered while designing the foundation and support structure for performance evaluation at DA premises are enumerated in subsequent paragraphs.

(e) The foundation for the equipment under testing must be made in the form of a ferro-concrete / ferro-cement block without rigid connections with the foundation of the building as well as with the foundation for the installation of auxiliary equipment.

(f) The mass of the block must be five times or more the mass of the equipment to be tested on the given foundation.

(g) The block must be laid on a layer of sea sand of thickness 1 meter or filled in a hydro-insulated basin and have an air gap of 200 mm or more along the complete perimeter up to a depth of not less than half the height of the foundation.

(h) On the block must be rigidly fixed mounting metallic plate or metallic supporting structures for fixing the equipment under testing in accordance with the requirements of methodology for checking vibration and airborne noise of machinery and equipment.

(j) When metallic supporting structures are used, their rigidity must be adequate so as to ensure that the fundamental natural frequency is not less than 200 Hz.

Safety/Lifting Arrangements/Tally & Diagram Plates

36. **Lifting Arrangement**. All components weighting more than 40 kg are to be provided with eyebolts. Where there is a danger of transit damage due to freedom of a dry rotor to move within its casing, a suitable jacking or rotor locking device is to be provided. A suitable warning plate is to be fitted in a prominent position (on the pump) to ensure it is removed before pump start up.

37. **Tallies**. All major components, switches, valves, cocks, gauges, indications etc (as applicable) are to have identification tallies located on them. Tally plates shall be in English language and in SI unit. All tallies and diagram plates shall be anodized aluminium alloy. Caution tally should be in bold black letter on a fluorescent orange background. A diagram plate indicating details of connection is to be provided/ affixed near the terminal box of the motor. Separate tally plates (made of brass & suitable for usage in marine environment) to be supplied indicating the start & stop instruction procedures of the equipment.

Performance Evaluation

38. The Developing Agency shall prepare a draft 'Test Protocol' for undertaking the performance evaluation of the prototype and submitted the same for approval by PFT. The performance evaluation will be undertaken as per the approved Test protocol.

39. The Developing Agency shall submit MEPC 107(49) compliance certification of the OWS plant duly certified by an IMO authorized agency to the PFT prior commencement of performance evaluation. The certificate should indicate exact value of parameters achieved during various tests conducted iaw MEPC 107(49) regulation. The prototype thereafter will be type tested which shall be guided by DGQA Policy Letter 12575/POLICY/DGQA/WP-TC dated 17 Mar 21. The various tested that will be conducted will be are elaborated in succeeding paragraphs.

40. **Safety Tests**. All protection devices are to be tested to establish satisfactory Operation.

41. **Ingress Protection (IP) Tests**. Ingress Protection test iaw **EN 60529** shall be undertaken to prove the intended IP rating mentioned in this PSQR.

42. **Tilt Test**. Tilt test would be conducted as per environmental conditions and GCR. The equipment is to be run for one hour with 30° tilt in each direction. All parameters are to be checked after 1hr.

43. **Electrical Components**. All test shall be carried out as per **EED-Q-071 (R4)** and submit the report to PFT.

Test	Specification	Test condition/ severity
Vibration	JSS 55555 Test 28	5-33 Hz
High temp	JSS 55555 Test 17	55°C for 16 Hrs
Damp heat	JSS 55555 Test 10	Procedure G 40-95°C RH for 16 Hrs
Drip proof	JSS 55555 Test 11	Vertical water drip 1m height for 15 min
Mould growth	JSS 55555 Test 21	29°C, 90% RH mould growth chamber for 28 days
Bumps	JSS 55555 Test 5	1000 bumps=40g, 6m/ sec
Sock/ Impact	JSS 55555 Test 24	As per laid down condition
Ship motion	GCR for DSV	As per laid down condition
EMI/ EMC	MIL-STD 461 E/F	EMI/ EMC Requirements shall be as follows:- For motor, (i) CE 101, CE 102 (ii) RE 101, RE 102 For Starter/ Control panel/ UPS, (i) CE 101, CE 102 (ii) RE 101, RE 102

Test	Specification	Test condition/ severity
		(iii) CS 101, CS 114, CS 115 (iv) RS 101, RS 102
Environmental Test Screening	DQAN-Policy 66301/Policy-07/DQA(N)/QA-07 dated 09 Aug 16	For PCBs and Electronic components

44. **Endurance Test**. The equipment would be subjected to an endurance test of not less than 100hrs under the specified environmental conditions iaw **NES 362**. The following parameters shall be recorded after every 02 hours:-

(a) Operating parameters.

(b) Operation of auto cut-out system.

(c) Noise and vibration level as per MIL STD 740-2.

(d) Airborne noise Level as per MIL 740-1(SH).

(e) Indication/ alarm/ shut down tests.

(f) Temperature rise.

(g) Dry and damp heat.

(h) Insulation resistance.

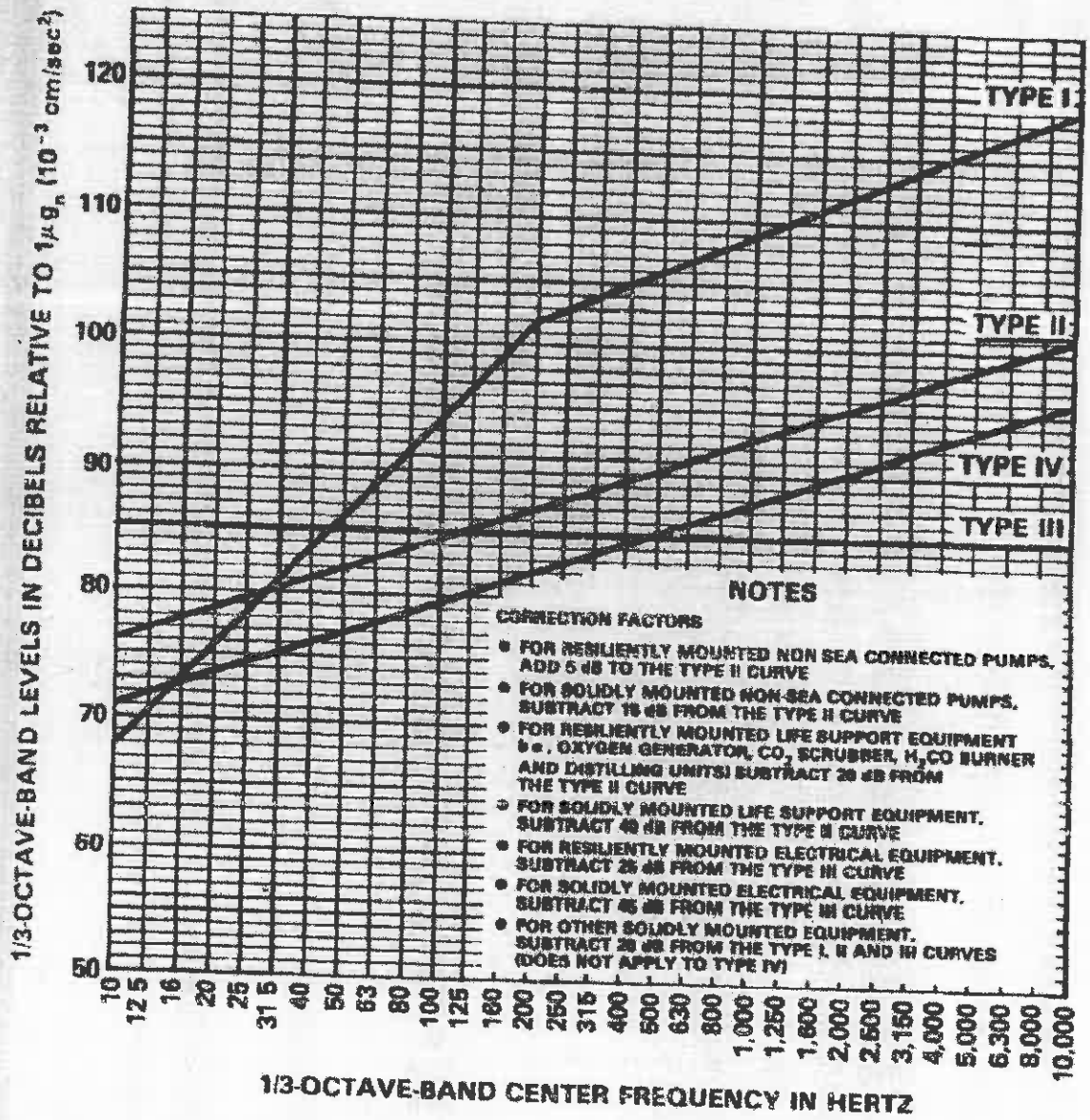
(j) Operation of protective device.

45. **SBN and ABN Tests**. The SBN data is critical to ensure that the noise transmitted by the equipment to the ship's hull is within the limits prescribed in the approved PSQR. MIL-STD-740-2 will be the guiding document for undertaking SBN measurements of shipboard equipment. ABN test is to be conducted as per MIL-STD-740-1 (SH) to ensure that the equipment/ system comply with the acceptable airborne sound level criteria. The weighted sound pressure levels and octave band sound pressure levels are to be measured at designated locations and the values obtained are to be compared with the limits specified in the PSQR to ascertain the acceptability of the equipment/ system.

46. **Vibration Tests**. Vibration tests to be undertaken with reference of **ISO 10816** and **MIL STD 167-1A**. Hull Vibrations will be measured iaw **ISO 6954** (1984).

47. **Production and Shipboard Trials**. The procedure for production test to be undertaken for OWS plants manufactured post successful performance evaluation of the prototype and also procedure for ship board trials will be promulgated in SQRs.

Appendix A
Clifu Para 30



SH 131830

FIGURE 2. Structureborne vibratory acceleration acceptance criteria.

STRUCTURE BORNE VIBRATORY ACCELERATION ACCEPTANCE CRITERIA (IAW MIL STD 740-2)

1/3 Octave-band Centre Frequency in Hertz	1/3 Octave Band Levels in Decibels (dB_A) (Ref $10^{-6}m/s^2$)
10	76
12.5	77
16	78
20	78.5
25	79.5
31.5	80.5
40	81
50	82
63	83
80	83.5
100	84.5
125	85
160	86
200	87
250	88
315	88.5
400	89.5
500	90
630	91
800	92
1000	93
1250	93.5
1600	94.5
2000	95
2500	96
3150	97
4000	98
5000	98.5
6300	99.5
8000	100
10000	101

Appendix B
(Refer to Para 31)

AIR BORNE NOISE ACCEPTANCE CRITERIA EQUIPMENT GRADE D (IAW MIL STD 1474E)

Equipment Grade : D	
Octave band Frequency (Hz)	**Sound Pressure Level in dB (Ref 20uPa)**
31.5	91
63	88
125	85
250	82
500	79
1000	76
2000	73
4000	70
8000	67

CHAPTER – THREE

DESIRABLE PARAMETERS

1. The equipment is required to be designed and developed as per the specifications mentioned in Chapter II. No further requirements is envisaged for inclusion in the design beyond the scope as mentioned in Chapter II.

Appendix 'D'
{Refers to Para 43(b)}

FINANCIAL AND COMMERCIAL ASSESSMENT CRITERIA

Name of the vendor:

Ser	Criteria and Sub- Criteria	Vendor Submissions			Remarks, if any
		Lead Bidder	Partner 1	Partner 2	
(i)	Turnover of at least Rs. 1 crore				Submit documents in support of these claims.
(ii)	Profitable for at least three out of last five years. In case of MSMEs, profitable for at least one out of the last three years				
(iii)	Positive Net Worth				

Station: **Signature** **Company Seal**

Date:

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Appendix 'E'
{Refers to Para 43(c)}

FINANCIAL ASSESSMENT CRITERIA FOR START-UPS

Name of the vendor:

Ser	Criteria and Sub- Criteria	Vendor Submissions			Remarks, if any
		Lead Bidder	Partner 1	Partner 2	
(i)	Capital assets				Submit documents in support of these claims.
(ii)	Credit rating				
(iii)	Turnover				
(iv)	Net profit				

Station: **Signature** **Company Seal**

Date:

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Appendix 'F'
{Refers to Para 42(c)}

COMMERCIAL ASSESSMENT CRITERIA FOR START-UPS

Name of the vendor:

Ser	Criteria and Sub- Criteria	Vendor Submissions			Remarks, if any
		Lead Bidder	Partner 1	Partner 2	
(i)	Nature of Company				Submit documents in support of these claims
(ii)	Category of Industry				
(iii)	Company location				
(iv)	History of successful execution of supply orders(with examples)				
(v)	History of past non-performing contracts				
(vi)	Pending Litigation/ Litigation history				

Station: **Signature** **Company Seal**

Date:

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Appendix 'G'
{Refers to Para 40, 43(d)}

Name of the vendor:

TECHNICAL CAPABILITY ASSESSMENT CRITERIA

Ser	Criteria and Sub- Criteria	Vendor Submissions			Remarks, if any
		Lead Bidder	Partner 1	Partner 2	
(i)	Execution of similar projects for military users in India and abroad				
(ii)	Execution of similar projects for other users in India and abroad				
(iii)	Execution of projects pertaining to critical technology area				
(iv)	Adherence to timelines, minimization of slippages, cost overruns				
(v)	Approach to meet user functionalities. Specific areas where assistance of Academia/ other industries where the resident expertise is not available with the respondent is to be indicated. Nature of partnership/ assistance to be sought is to be indicated.				
(vi)	Proposed system configuration. Approach to meet the specifications stipulated giving details of methodology to be adopted				
(vii)	Approach to address assembly and inter-operability issues.				
(viii)	Availability of Class Certification from IACS member society				

Station:

Date:

Signature

Company Seal

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Appendix 'H'
(Refer to Para 43(e))

INFORMATION PERFORMA: FOR RESPONDENTS OTHER THAN START-UPS

1. Name of the Company
2. Name of CEO with Designation
3. Address of the Registered Office
4. Address of the Factory/Factories
5. Company Website(s)
6. Date of Incorporation
7. Brief History of the Company
8. Category of Industry (Large Scale/Medium Scale/Small Scale)
9. Nature of Company (Public Limited/Private Limited)
10. Nature of Business (Please give broad product range against each)
    - (a) Manufacturer
    - (b) Trader
    - (c) Sole Selling or Authorised Agent
    - (d) Dealer
    - (e) Assembler
    - (f) Processor
    - (g) Re-packer
    - (h) Service Provider
11. Details of Current Products
    - (a) Type/Description

(b) Licensed/Installed Capacity

(c) Annual Production for preceding 3 Years

12. Details of Bought Out Items

(a) Main Equipment

(b) Component/Assembly/Sub Assembly/Processes

(c) Name and Address of the Sub-Contractor

13. Sources of Raw Materials

(a) Imported/Indigenous

(b) Brief Description

(c) Estimated CIF Value

(d) Percentage FE Content in Final Product

14. Details of Foreign Collaborations

(a) Product

(b) Name and Address of Collaborator

(c) Year of Collaboration

(d) Current Status of the Collaboration (whether expired or current)

15. Technology Received from Abroad and Assimilated

16. Technology Transfer MoUs Signed/Under Negotiation

17. Products Already Supplied

(a) To Indian Army/Air Force/Navy/ Coast Guard

(b) PSUs

(c) DRDO and its Laboratories

(d) Shipyards

(e) Any other Defence Organisation

(f) To other Principal Customers

18. Details of Registration Certification held (along with product details)

(a) DGQA
(b) DGAQA/DGNAI
(c) CEMILAC
(d) DGS&D
(e) Other Defence Departments
(f) Other Government Department

19. Details of ISO Certification (Attach certificate, if any)

20. Details of Pollution Control Certificate (Attach certificate, if any)

21. Latest Certificate of Incorporation by the Registrar of Companies (RoC), if any

22. Details of Credit Rating Certificate (Attach certificate, if any)

23. Details of Patent/IPR certificates (Attach certificate, if any)

24. Details of Permanent Man Power (with the details of qualifications)

(a) Technical
(b) Administrative

25. Total Area of Factory

(a) Covered (sq. mtrs)
(b) Uncovered (sq. mtrs)
(c) Bonded Space Available (sq. mtrs)

26. Electric Power

(a) Sanctioned
(b) Installed
(c) Standby

27. Details of Important Facilities

(a) Production (including Heat Treatment, Dies, Jigs and Fixtures)

(b) CAD, CAM, ROBOTS and Other Advanced Technology Tools

(c) Environmental Test Facilities.

(d) Tool Room, Metrology and Test Equipment and Facilities

(e) Type of Instrument

(f) Make and Model

(g) Date of Purchase

(h) Frequency of Calibration

28. Details of Developmental Facilities

(a) R&D Facilities Available

(b) Number of Technical Manpower

(c) Inspection and Quality Control of Raw Material, Components and Finished Products.

(d) Assistance from Central Agency/Agencies for Testing/Calibration

(e) Laboratory and Drawing Office Facility

(f) Percentage of Total Turn-Over Spent on R&D during the Last Three Years

29. Area of Interest for Future Expansion/Diversification (please provide adequate details)

30. Future Plan (if any) in respect of Expansion Program, Installation of Additional Machines/Test Facilities

31. Turn-Over during the last three Financial Years (Attach relevant documents, if any).

32. Present Net Worth of the Company (Attach relevant documents, if any)

33. Any other Relevant Information

34. Contact Details of the Executive Nominated to co-ordinate with the Assessment Team (please provide telephone, mobile and e-mail address).

ADDITIONAL INFORMATION

35. Outline features of the proposal.

36. Recommended stages/phases of development with priorities and time schedules.

37. Milestones that can be clearly demonstrated to facilitate project monitoring.

38. Estimated capital expenditure for prototype development.

39. Roles Responsibilities and expertise details of consortium members, if any.

40. Role of foreign technology provider, if any, including the agreement intended to be entered into on being shortlisted.

41. Requirement of specialised testing assistance where facilities are available only with DRDO/DGQA/NMRL.

42. Indicate the minimum order quantity for execution after the successful completion of the project (prototype development).

43. Undertaking to furnish the cost of the final product during evaluation stage itself, once the final configuration of the end product under development is frozen.

44. Details of the proposed facilities being created for Marine Oily Water Separator.

45. Any existing facility proposed to be used for production/ manufacture of Marine Oily Water Separator components.

INFORMATION PROFORMA: FOR START-UPS

1. Name of the Vendor/Company/Firm

2. Brief about the Company (Nature & category of company)

3. Contact Details

4. Local Branch/Liaison Office/Contact in Delhi

5. Details of Registration Certification held (along with product details). Attach certificate, if any

   (a) DGQA
   (b) NMRL/ NSTL
   (c) CEMILAC
   (d) DGS&D
   (e) Other Defence Departments
   (f) Other Government Department

6. Membership of FICCI/ASSOCHAM/CII or other Industrial Associations. Give Name of Organisation and Membership number.

7. Credit rating of the company.

8. Details of Prototype/product to be developed

   (a) Name of product
   (b) Description (attach technical literature)
   (c) Specification of Material
   (d) Technical Specifications
   (e) Dimensions/Weight of the product
   (f) Type of tests planned to be carried out post manufacturing
   (g) Proposed methodology for evaluation
   (h) Conformance to MIL grade/international manufacturing standards
   (j) Details of inspection agency/Accredited Lab planned to be involved
   (k) Details of safeties to be incorporated

(l) Interface requirement

(m) Indigenous Content

(n) Product life

(p) Guarantee/Warranty

(q) Whether proposed product being offered is an invention/ improvement/ innovation? Please elaborate

(r) Tentative cost of the product

(s) Proposed timeline for development of prototype, and if successful, production and delivery timelines, along with the cost breakup

(t) If the price varies with the number of procurement, please indicate cost breakup vis-à-vis number

9. Details of products developed earlier

10. Products Already Supplied

(a) To Indian Army/Air Force/Navy/ Coast Guard

(b) PSUs

(c) DRDO and its Laboratories

(d) Shipyards

(e) Any other Defence Organisation

(f) To other Principal Customers

11. Execution of similar projects for military users in India and abroad

12. Execution of similar projects for other users in India and abroad

13. Execution of projects pertaining to critical technology area

14. History of successful supply orders (Attach relevant documents, if any)

15. History of past non-performing contracts (Attach relevant documents, if any)

16. Pending litigation/Litigation history (Attach relevant documents, if any)

17. Capital Asset of the Company

18. Turn-over during last three Financial Years (Attach relevant documents, if any)

19. Present Net Worth of the Company (Attach relevant documents, if any)

20. Net profit in the last five years

21. Any other relevant information

Declaration. It is certified that the above information is true and any changes will be intimated at the earliest

Appendix 'J'
{Refers to Para 43(f) & 45(a)}

CERTIFICATE

It is certified that information submitted in the documents as part of the response to Expression of Interest for Project Marine Oily Water Separator is correct and complete in all respects. It is acknowledged that the company and/or all consortium members will be disqualified from further participation if any information provided is found to be incorrect.

Signature with Company Seal

Company No1	**Company No 2**	**Company No3**

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Appendix 'K'
(Refers to Para 23)

TRIAL METHODOLOGY

1. **Inspection, Tests and Trials**. The DAs shall submit a draft QAP to Indian Navy/ PFT for approval. The inspection/trials agencies shall be as follows:-

(a)	For design	:	Professional Directorate/ DME
(b)	Stage inspections	:	Indian Navy/ PFT nominated agency
(c)	For SSCT	:	Indian Navy (DME)/ PFT and PFT nominated agency (Classification Society) at manufacturers' premises or/ and other location as specified.
(d)	For installation	:	Indian Navy (DME)/ PFT and PFT nominated agency
(e)	For ship trials	:	Indian Navy (DME)/ PFT and PFT nominated agency (Classification Society)

2. The Developing Agency shall prepare a draft 'Test Protocol' for undertaking the performance evaluation of the prototype and submit the same for approval by PFT. The performance evaluation will be undertaken as per the approved Test protocol.

3. The Developing Agency shall submit MEPC 107(49) compliance certification of the OWS plant duly certified by an IMO authorized agency to the PFT prior commencement of performance evaluation. The certificate should indicate exact value of parameters achieved during various tests conducted iaw MEPC 107(49) regulation. The prototype thereafter will be type tested which shall be guided by DGQA Policy Letter 12575/POLICY/DGQA/WP-TC dated 17 Mar 21. The various tested that will be conducted are elaborated in succeeding paragraphs.

4. **Safety Tests**. All protection devices are to be tested to establish satisfactory Operation.

5. **Ingress Protection (IP) Tests**. Ingress Protection test iaw **EN 60529** shall be undertaken to prove the intended IP rating mentioned in this PSQR.

6. **Tilt Test**. Tilt test would be conducted as per environmental conditions and GCR. The equipment is to be run for one hour with 30° tilt in each direction. All parameters are to be checked after 1hr.

7. **Electrical Components**. All test shall be carried out as per **EED-Q-071 (R4)** and submit the report to PFT.

Test	Specification	Test condition/ severity
Vibration	JSS 55555 Test 28	5-33 Hz
High temp	JSS 55555 Test 17	55°C for 16 Hrs
Damp heat	JSS 55555 Test 10	Procedure G 40-95°C RH for 16 Hrs
Drip proof	JSS 55555 Test 11	Vertical water drip 1m height for 15 min
Mould growth	JSS 55555 Test 21	29°C, 90% RH mould growth chamber for 28 days
Bumps	JSS 55555 Test 5	1000 bumps=40g, 6m/ sec
Sock/ Impact	JSS 55555 Test 24	As per laid down condition
Ship motion	GCR for DSV	As per laid down condition
EMI/ EMC	MIL-STD 461 E/F	EMI/ EMC Requirements shall be as follows:- For motor, (i) CE 101, CE 102 (ii) RE 101, RE 102 For Starter/ Control panel/ UPS, (i) CE 101, CE 102 (ii) RE 101, RE 102 (iii) CS 101, CS 114, CS 115 (iv) RS 101, RS 102
Environmental Test Screening	DQAN-Policy 66301/Policy-07/DQA(N)/QA-07 dated 09 Aug 16	For PCBs and Electronic components

8. **Endurance Test**. The equipment would be subjected to an endurance test of not less than 100hrs under the specified environmental conditions iaw **NES 362**. The following parameters shall be recorded after every 02 hours:-

(a) Operating parameters.

(b) Operation of auto cut-out system.

(c) Noise and vibration level as per MIL STD 740-2.

(d) Airborne noise Level as per MIL 740-1(SH).

(e) Indication/ alarm/ shut down tests.

(f) Temperature rise.

(g) Dry and damp heat.

(h) Insulation resistance.

(j) Operation of protective device.

9. **SBN and ABN Tests**. The SBN data is critical to ensure that the noise transmitted by the equipment to the ship's hull is within the limits prescribed in the approved PSQR. MIL-STD-740-2 will be the guiding document for undertaking SBN measurements of shipboard equipment. ABN test is to be conducted as per MIL-STD-740-1 (SH) to ensure that the equipment/ system comply with the acceptable airborne sound level criteria. The weighted sound pressure levels and octave band sound pressure levels are to be measured at designated locations and the values obtained are to be compared with the limits specified in the PSQR to ascertain the acceptability of the equipment/ system.

10. **Vibration Tests**. Vibration tests to be undertaken with reference of **ISO 10816** and **MIL STD 167-1A**. Hull Vibrations will be measured iaw **ISO 6954** (1984).