STATEMENT OF TECHNICAL REQUIREMENTS

FOR

ELECTRICAL GALLEY EQUIPMENT

EED-50-122

Dec 14
## Record of Amendments

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Amendment</th>
<th>Authori</th>
<th>Date</th>
<th>Signature</th>
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<tbody>
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<td>1.</td>
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**Revision Note:** - Nil

**Historical Record:** - Nil
CHAPTER-I

INTRODUCTION
1. This EED covers the design, manufacture, testing and onboard commissioning requirements of Electrical Galley Equipment to be fitted on Indian Naval Warships and other Naval ships/crafts. Any deviation from these specifications would be considered only with prior approval of NHQ/DEE. Consideration to departure from the specification will be given when difficulties are encountered during the construction of the light fittings.

2. **Applicability of EED-50-122.** This applicability of the EED-50-122 is as follows:

   (a) All new procurements by Commands/Dockyards.

   (b) All procurements by Shipyards for new construction ships where the build specs specifically indicates the EED.

   (c) The revised EED will not be applicable to any existing orders or any repeat orders for ongoing / existing contracts.

3. **Applicable Standards.** The design and technical requirements of galley equipment have been elucidated in subsequent Chapters. The aspects of Standards and Specifications, Quality Assurance, Installation/ Training and Maintenance have been detailed at Appendices A to L.

4. **Order of Precedence.** Unless otherwise noted in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

5. **Acronyms.** The following acronyms are included herein for ready reference and are applicable for the purpose of this EED.

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Terms</th>
<th>Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>SOTRs</td>
<td>Statement of Technical Requirements</td>
</tr>
<tr>
<td>(b)</td>
<td>RFP</td>
<td>Request For Procurement</td>
</tr>
<tr>
<td>(c)</td>
<td>IEC</td>
<td>International Electro-technical Commission</td>
</tr>
<tr>
<td>Sl.No</td>
<td>Terms</td>
<td>Expansion</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>(d)</td>
<td>EMI/EMC</td>
<td>Electromagnetic Interference / Electromagnetic Compatibility</td>
</tr>
<tr>
<td>(e)</td>
<td>MTTR</td>
<td>Mean Time to Repair</td>
</tr>
<tr>
<td>(f)</td>
<td>MTBF</td>
<td>Mean time Between Failure</td>
</tr>
<tr>
<td>(g)</td>
<td>DI/DR</td>
<td>Defect Identification/Defect Rectification</td>
</tr>
<tr>
<td>(h)</td>
<td>INCAT</td>
<td>Indian Naval Catalog of Inventory</td>
</tr>
<tr>
<td>(j)</td>
<td>ATP</td>
<td>Acceptance Test Procedures</td>
</tr>
</tbody>
</table>
CHAPTER II - TECHNICAL AND DESIGN REQUIREMENTS

1. **Technical Specifications.** The design of galley equipment should conform to the following technical and operational design requirements:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Equipment Name</th>
<th>Capacity</th>
<th>Specification / Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Baking Oven</td>
<td>20-80 Kgs</td>
<td>(i) IEC 60068 – 2-2/ equivalent for Cold, Dry heat, FC(vibration sinusoidal), Damp heat cyclic, Salt mist cyclic. (Severities applicable for Merchant Ships)</td>
</tr>
<tr>
<td>2</td>
<td>Deep Fat Fry Fryer</td>
<td>10 – 50 Ltrs</td>
<td>(ii) IEC 60068-2-27// equivalent for shock. (Severities applicable for Merchant Ships)</td>
</tr>
<tr>
<td>3</td>
<td>Dough Kneading Machine</td>
<td>30-80 Kgs</td>
<td>(iii) IEC 61347-1 Clause 11/ equivalent / equivalent for Humidity and Heat tests.</td>
</tr>
<tr>
<td>4</td>
<td>Wet Grinder</td>
<td>10 -30 Kgs</td>
<td>(iv) IEC 60945 / equivalent for EMI/EMC. (Severities applicable for Merchant Ships)</td>
</tr>
<tr>
<td>5</td>
<td>Refrigerator</td>
<td>150- 400 Ltrs</td>
<td>(v) IEC 60529/ equivalent for IP protection.</td>
</tr>
<tr>
<td>6</td>
<td>Deep Freezer</td>
<td>100-300 Ltrs</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dry Grinder</td>
<td>05-20 Kgs</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Vegetable Cutting Machine</td>
<td>05- 30 Kgs</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Meat/Vegetable Mincing Machine</td>
<td>05- 30 Kgs</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Cooking Range</td>
<td>2- 6 Hot Plates (Induction/Coil based)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Water Boiler</td>
<td>30 – 100 Ltrs</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Vegetable Slicing Machine</td>
<td>05- 30 Kgs</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Electric Griller</td>
<td>20 – 100 Ltrs</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Dish washer</td>
<td>20- 100 plates</td>
<td></td>
</tr>
</tbody>
</table>

**Marinised COTS Equipment List**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Equipment Name</th>
<th>Capacity</th>
<th>Specification / Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Garbage Disposal Unit</td>
<td>100 Kgs</td>
<td>COTS(as-it-is condition)</td>
</tr>
<tr>
<td>16</td>
<td>Toaster</td>
<td>12-120</td>
<td></td>
</tr>
<tr>
<td>Sl No</td>
<td>Equipment Name</td>
<td>Capacity</td>
<td>Specification / Standards</td>
</tr>
<tr>
<td>-------</td>
<td>------------------------------</td>
<td>------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>17</td>
<td>Food Processor</td>
<td>20-80 Kgs</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Microwave Oven</td>
<td>20-60 Ltrs</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Idly Making Machine</td>
<td>100-500 /Hr</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Potato Peeler</td>
<td>05-20 Kgs</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Electric Boiler</td>
<td>05- 30 Ltrs</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Food Warmer</td>
<td>Customised</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Knife Sharpener</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Dosa Making Machine</td>
<td>20-200/Hrs</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Vacuum Cleaner</td>
<td>10-30 Kgs</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Floor Cleaning Machine</td>
<td>2 x 2 feet</td>
<td>Sweep Area</td>
</tr>
<tr>
<td>27</td>
<td>Pesto Flash</td>
<td>2 – 8 Tubes</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Water Dispenser</td>
<td>20-60 Ltrs</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Ultrasonic Rat Repleant</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Pop Corn maker</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Egg Beater</td>
<td>20-60 eggs</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Ice Cream Making Machine</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Coffee/Tea Vending machine</td>
<td>200-300 cup/Hrs</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Soft Drink Plant</td>
<td>200-300 Cup/Hrs</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER III - TESTING AND ACCEPTANCE

Eligibility Criteria. The eligible vendor should have CoCs/Type Test certificate of marinised COTS/COTS equipment as per the required standards conforming, indicated in Para 1 of Chapter I. In case the marinised COTS/COTS galley equipment have not been certified or the design/material/technical specifications of the galley equipment offered by the vendor have been changed/upgraded from the already approved equipment, then fresh certification is required as per the requirement specified in this EED. The firm should be in the field of manufacturing of galley equipment and shall submit documentary evidence to this effect along with their offer.

1. Testing and Acceptance. Marinised COTS/COTS galley equipment will be accepted post scrutinizing of Certificate of Conformity (CoCs)/Type Test certificate. CoCs/Type Test certificate of marinised COTS/COTS equipment submitted by vendors shall include the standards to which the items comply and physical values of test conditions as per the required standards conforming, indicated in Para 1 of Chapter I.

2. The supplier is required to submit draft ATP to IHQ MoD(N)/Commands(for MO orders) for approval within one month of placement of order. The approving authority reserves the right to amend/modify the ATP. Compliance to environmental and EMI/EMC tests specifications as stipulated in the SOTRs would involve conduct of physical tests or scrutiny of test reports/CoCs as deemed applicable. All items which are sourced from OEM/sub-contractors and delivered in ‘as-it-is’ condition would be approved by IHQ MoD(N)/Commands(for MO orders). Such items would be accepted based on functional checks(as per approved ATP) and scrutiny of CoCs clary endorsing the standards to which the items comply and physical values of test conditions as per the required standards conforming, indicated in Para 1 of Chapter I.

3. The item should be of latest manufacture conforming to current production standards and having 100% defined life at the time of delivery.

4. Environmental Conditions. The marinised COTS equipment shall be designed to meet the environment conditions as specified below:-

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Test</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>EMI/EMC</td>
<td>IEC 60945 / equivalent</td>
</tr>
<tr>
<td>2.</td>
<td>Enclosure Protection</td>
<td>IEC 60529/ equivalent</td>
</tr>
<tr>
<td>3.</td>
<td>Intrinsically safe certification</td>
<td>IEC 60079-20,1:2010 / equivalent</td>
</tr>
<tr>
<td></td>
<td>Environmental testing</td>
<td>IEC 60068 – 2-2/ equivalent (Severities applicable for Merchant Ships)</td>
</tr>
<tr>
<td>---</td>
<td>------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>Cold, Dry heat, FC(vibration sinusoidal), Damp heat cyclic, Salt mist cyclic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humidity and Heat tests</td>
<td>IEC 61347-1 Clause 11/ equivalent (Severities applicable for Merchant Ships)</td>
</tr>
<tr>
<td>5</td>
<td>Shock</td>
<td>IEC 60068-2-27/ equivalent (Severities applicable for Merchant Ships)</td>
</tr>
</tbody>
</table>
Appendix A
(Refers to Para 3 of Chapter I)

**GENERAL STANDARDS AND SPECIFICATIONS**

**POWER SUPPLY**

The equipment will be supplied with ship’s primary supply or secondary power supply, three/single phase (to be supplied by Order placing authority). The equipment should be able to withstand ± 10 % fluctuation in voltage and ± 3 % fluctuation in frequency. Provision for transient protection should exist. The tolerance values of supply onboard are tabulated below:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Parameter</th>
<th>Tolerance Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Nominal voltage</td>
<td>/ 380/415/4 40/220 V</td>
</tr>
<tr>
<td>(b)</td>
<td>Average line to the value of 3 phase system</td>
<td>± 10%</td>
</tr>
<tr>
<td></td>
<td>Line to line voltage of 1 phase of 3 phase system</td>
<td>± 12%</td>
</tr>
<tr>
<td>(c)</td>
<td>Maximum unbalance</td>
<td>3%</td>
</tr>
<tr>
<td>(d)</td>
<td>Maximum modulation</td>
<td>3%</td>
</tr>
<tr>
<td>(e)</td>
<td>Transients and Recovery Time</td>
<td>+10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 15%</td>
</tr>
<tr>
<td>(f)</td>
<td></td>
<td>1.0 SEC</td>
</tr>
<tr>
<td>(g)</td>
<td>Waveform</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximum Individual Harmonic</td>
<td>4%</td>
</tr>
<tr>
<td>(h)</td>
<td>Maximum Total Harmonic Content</td>
<td>8%</td>
</tr>
<tr>
<td>(j)</td>
<td>Nominal Frequency</td>
<td>50Hz</td>
</tr>
<tr>
<td>(k)</td>
<td>Load Range Tolerance</td>
<td>± 4%</td>
</tr>
<tr>
<td>(l)</td>
<td>Constant Load Tolerance</td>
<td>± 1 %</td>
</tr>
<tr>
<td>(m)</td>
<td>Modulation</td>
<td>0.5%</td>
</tr>
<tr>
<td>(n)</td>
<td>Transients and Recovery Time</td>
<td>+ 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Sec</td>
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</tbody>
</table>
Appendix B
(Refers to Para 3 of Chapter I)

GENERAL STANDARDS AND SPECIFICATIONS
RELIABILITY AND MAINTAINABILITY

1. System Performance.

(a) Design Review. The galley equipment OEM is required to schedule formal design reviews during the development of marinised COTS galley equipment to ensure that the user requirements and envisaged functionalities are captured correctly at the design stage. The frequency of the design reviews will be finalized during the contract conclusion. For COTS equipment the design review is not required.

(b) Reliability. The system design should be based on standard engineering principles to provide a reliable product. The reliability figures in terms of MTBF / MTTR shall be estimated by the OEM and submitted as part of the technical proposal. The system performance will degrade gracefully in the event of a failure. The system will contain no ‘single point’ control, whose malfunctioning would result in a catastrophic failure. The functional redundancy will be available in the shortest possible time through hardware reconfiguration without loss of time. The design will cater for adequate fail safe features.

(c) Maintainability. The built-in test equipment (BITE) if applicable will be capable of detecting and localising faults down to a single replaceable module. The manufacturer will prepare and submit the following data on maintainability:-

(i) Maintainability programme
(ii) Maintainability prediction

2. MTBF/MTTR. System shall be designed for high MTBF (Mean Time Between Failures) of greater than 50000 hours and low MTTR (Mean Time To Repair) of not exceeding 60 minutes.

3. Commonality. The manufacturer to mention the level of commonality achieved within the system as applicable at the following levels:-

(a) Module/sub module level
(b) PCB level
(c) Component level.
Appendix C
(Refers to Para 3 of Chapter I)

GENERAL STANDARDS AND SPECIFICATIONS

DESIGN REQUIREMENTS

1. Safety Standards. The system should offer total safety to personnel from moving parts and other associated equipment from shock. All units are to be provided with earthing bolt. Where units are connected with the ship's main, fuse protection is to be provided. Each unit where dangerous voltages are present will bear a Red Label stating in bold white characters the highest voltages inside the unit. Doors and panels are to be provided with safety door switches, wherever necessary.

2. Standardisation and Metrication. The equipment and all its components are to be fully in metric system. It is to be ensured that assemblies, sub-assemblies, components, parts and material used conform to the specified requirements and standards.

3. Mounting Arrangement. The mounting arrangement for the system on the ship need to be indicated after consultation with the respective authorities. The manufacturer needs to coordinate with the ship yard / installation agency for the installation details. The procedure for installation inspection if applicable needs to be indicated.

4. Tally and Diagram Plates. All tallies and diagram plates shall be anodized aluminum alloy or naval brass. Size of tally plate and their letters shall conform to specification NES-723. VOLTAGE DANGER tally shall be provided on the system at a permanent place where required. Safety markings on the units and associated devices/ units shall conform to NES 784.

5. Terminal. Bolted type terminal and crimped socket of electrolytic copper are to be provided for all incoming and outgoing cables. Adequate spare terminals are also to be provided.

6. Shock Mounts. The equipment would be mounted on shock mounts (if applicable) onboard the ship. Suitable shock mounts are to be provided by the firm.
GENERAL STANDARDS AND SPECIFICATIONS
QUALITY ASSURANCE / CONTROL

1. Marinised COTS/COTS galley equipment will be accepted post scrutinizing of Certificate of Conformity (CoCs)/ Type Test certificate. CoCs/Type Test certificate of marinised COTS/COTS equipment submitted by vendors shall include the standards to which the items comply and physical values of test conditions as per the required standards conforming, indicated in Para 1 of Chapter I.

2. The supplier is required to submit draft ATP to IHQ MoD(N)/Commands(for MO orders) for approval within one month of placement of order. The approving authority reserves the right to amend/modify the ATP. Compliance to environmental and EMI/EMC tests specifications as stipulated in the SOTRs would involve conduct of physical tests or scrutiny of test reports/CoCs as deemed applicable. All items which are sourced from OEM/sub-contractors and delivered in ‘as-it-is’ condition would be approved by IHQ MoD(N)/Commands(for MO orders). Such items would be accepted based on functional checks(as per approved ATP) and scrutiny of CoCs clary endorsing the standards to which the items comply and physical values of test conditions as per the required standards conforming, indicated in Para 1 of Chapter I.

3. The item should be of latest manufacture conforming to current production standards and having 100% defined life at the time of delivery.

4. The QAP checks would be carried out by the Authorized Inspection Agency, as appointed by the Indian Navy.

5. **Environmental Stress Screening (ESS) Test and Burn-in Test.** Not Applicable.

6. **Components.** The components used in galley equipment shall withstand the severe marine environment prevalent onboard warships. Standard specification and grade of material of each component used shall be indicated in the binding drawings. Make and type of components are to be listed in the binding drawings. The fixture should be suitably customized to meet specified IP requirements for use in open weather conditions.

7. **Internal Wiring.** The internal cabling is required to undertaken using Low Fire Hazard (LFH) cables/wires.

8. **Cable Entry Glands.** Cable entry glands shall be provided for incoming and outgoing cables. Commercial compressible cable glands of IP 65 or above are required to be provided.
9. **Shock Specification.** The shock and dynamic acceleration specifications need to be indicated by the OEM for complete equipment. The galley equipment and its sub systems should meet the specified shock standards. CoCs and tests details to be submitted by the Vendor to IHQ MoD (N) / QA authority for vetting and acceptance. For COTS item this is not required.

10. **Test Points.** All test points, indicators and controls shall be suitably labeled and the same to be elaborated in the concerned document. All connectors required for the testing needs to be supplied with the equipment.

11. **Inspection & Testing.**

   (a) **Inspection.**

   (i) Inspection Authority : DQA(N), West Block, RK Puram, Delhi-110066
   (ii) Inspecting Officer : Concerned Field Unit of DQA(N)
   (iii) Receipt Inspection : Shipyards / MOs
   (iv) Installation : Shipyards/Repair Yards with participation of firm rep.
   (v) Ship trials : ETMA (MBI)

   (b) The product offered by the manufacturers should conform to standard engineering practices. The system will be subjected to stage inspection and final test and trials by the Naval Inspection Agencies as mutually agreed with the manufacturer. Any deviation from the mentioned specifications will be brought to the notice of IHQ-MoD (Navy).

12. **Setting to Work (STW) & GRAQ.** The supplier is required to furnish the details of tests (GRAQ) to be carried out on-board for carrying out tests by owner’s rep. The supplier should submit provisional GRAQ procedure for approval of Shipyards & IHQ-MoD (N) within two months of placement of order. The supplier is also required to provide necessary representative (s) to assist during the following phases:

   (a) On – Board Installation
   (b) Trials as per approved GRAQ

13. **Approval of Drawings.** The production drawings if applicable for marinised COTS equipment would be approved by the order placing authority/directorate at IHQ MoD(N).

14. **Burn-in Test/Endurance.** Not applicable
GENERAL STANDARDS AND SPECIFICATIONS
EMI / EMC CONSIDERATIONS

1. **EMI/EMC Specifications.** All marinised COTS galley equipment should have total electro-magnetic compatibility with all shipboard equipment. EMI/EMC checks are to be undertaken as per IEC 60945. The OEM/Vendor would be required to submit CoCs/Type Test certificates to IHQ MoD (N)/QA for scrutiny and approval.

2. **ESD Protection.** The system design will take into account adequate measures for Electro Static Discharge (ESD) control and protection at PCB/module/assembly and unit level. Each Electro Static Discharge sensitive part/assembly will be duly marked with a symbol/warning. The manufacturer will use ESD protective materials for handling, packaging storage and transport.
GENERAL STANDARDS AND SPECIFICATIONS
SUPPLIER’S SCOPE OF SYSTEM SUPPLY

1. The supplier's scope of system supply shall cover the supply of equipment, Installation Material, Spares, Drawings and Documentation of Galley equipment. The supplier is to list down in detail, the deliverables to be provided to the customer at various stages of supply as mutually agreed upon. The complete scope of supply of the system by supplier shall include material as given in succeeding paragraphs.

2. **Installation Material.** One set of installation material that includes connectors, shock mounts, special fasteners, special tools, special fittings etc. which shall be supplied by the supplier.

3. **Testing and Tuning Spares.** The supplier shall recommend one set of Testing and Tuning Spares as required for installation.

4. **Special Tools and Test Equipment.** The OEM is to provide details of following test equipment that would be required taking into account IN's maintenance philosophy.

   (a) **Onboard Test Equipment.** This should be adequate to meet the requirement of all repairs/maintenance expected to be carried out onboard ship by the ships staff.

   (b) **Special test equipment.** Special-to-type test equipment if applicable shall be made available in the shore base for specific tests/checks on the equipment.

5. **Service of Engineer.** The supplier is required to provide the necessary representative(s) during the following phases to assist in carrying out:

   (a) Installation of equipment onboard ship.
   (b) ATP/Onboard Trials.

6. **On Board Spares (OBS).** For marinised COTS galley equipment, the supplier shall prepare the list of OBS (including onboard maintenance tools) based on the Reliability and Maintainability data and taking into account IN’s maintenance philosophy, and shall forward to IHQ MOD (Navy) for vetting during the pre-bid meeting. The manufacturer should clearly indicate the basis for ranging and scaling of spares. This should include the list of spare parts, tools and accessories, which must be carried on the ship, for preventive maintenance, trouble shooting and quick repairs to ensure no more than 30 minutes of ‘Down Time’ for the system at any given instance. One set of OBS is to be supplied with the system. The complete
inventory of system parts including OBS & B&D spares is to be provided in INCAT (Indian Naval Catalogue of Inventory) compatible format in electronic media for ILMS (Integrated Logistics Management system) of Indian Navy, for the management of spares. The supplier shall provide both hard copy as well as soft copy. PCBs if any ,offered as OBS should also undergo Endurance Test either on a reference system or on main system. However, in case the qty of PCBs is large, Endurance Test to be conducted on a sampling plan, approved by Insp. Authority.

List of all spares/items used in the system with the following classification and details is to be provided to the IN during the pre-bid meeting:-

(a) COTS / Non COTS items.
(b) PCB or module functionality - Processor Function/ Input - Output Function
(c) Memory Devices
(d) With /without embedded software.
(e) Hydraulic components /Electrical drives
(f) Produced by vendor quoting/ sourced.
(g) Repairable by vendor quoting/ repaired by third party.
(h) Checked by BITE/Not Checked by BITE.
(j) Estimated MTBF in hours.
(k) Circuit diagrams available/not available.
(l) Consumables like fuses, indication lamps etc.
(m) Numbers/quantity fitted the system.
(n) Shelf life of spare.
(p) Itemised cost of all items.

7. Five Year Base and Depot Spares. For marinised COTS galley equipment, the OEM should forward recommended list of B&D spares, tools and test equipment for vetting of IHQ MOD (Navy). B & D Spares should consist of spare parts and modules required to replenish depot holdings for a period of five years. These should also contain complete subsystems and assembly spares for the major refit (and thorough checking thereafter) of the system. It should also include exclusive Depot Spares comprising PCBs. The manufacturer should clearly indicate the basis for ranging and scaling of spares. The supplier shall also provide finalised / approved list of B&D spares in INCAT (Indian Naval Catalogue of Inventory) databank compatible format in electronic media. The onboard, base and depot, testing & tuning spares and long term exploitation spares should be indicated with a standard part no for identification and traceability as per Navy’s standards. Order for B&D spares would be placed separately. The classification and details as per Para 5 above, for all approved B&D spares/items used in the system should be provided to the IN during the pre-bid meeting. Following points in respect of spares of the equipment needs to be mentioned :-

(a) The basis of ranging and scaling to be clearly indicated.
(b) Commitment from the manufacturer for continuous customer and spare support for a specified duration for the life of the equipment.

(c) Commitment to undertake upgradation of the spares if required due to non-availability of the spares due to obsolescence.

(d) The supplier is required to indicate the make and part no. of each item. The details of spares are to be provided in ILMS format (both hard copy and soft copy to be provided).

(e) Base spares recommendation is to cover maintenance / overhaul requirements for 5 years including two refits.

(f) The details of tools and STTE required for carrying out 3rd and 4th level maintenance to be included in the offer.

(g) The supplier shall provide average life of all B & D spares and specify the turnaround time required for repairs/replacement of each spare.

8. **Drawings and Documentation** (As applicable)

(a) Firm is required to submit one hard copy and one soft copy of the draft system documents to IHQ MOD (Navy) for vetting at least 3 months prior to conduct of ATP of the equipment.

(b) One set of finalised / approved documents should be supplied with the equipment. Additional 6 sets (hard copy) and one soft copy on CD ROM of documents should also be supplied.

(c) Supply of documents will be part of the order and should be costed for in the order.

(d) Documents in CD-ROM are to be as per Level 1 Interactive Electronic Technical Manual (IETM).

(e) The documentation and drawings as applicable shall contain complete information for installation, operation, inspection, maintenance, repair / overhaul, testing and trials and should include the following:-

<table>
<thead>
<tr>
<th>SI No.</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>Design Specifications</td>
<td>The design specification for the System and its</td>
</tr>
<tr>
<td></td>
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<tr>
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</tr>
<tr>
<td>(i)</td>
<td>User hand book</td>
<td>Covering composition and brief description of equipment with block diagram; Technical parameters; Brief technical description with Photographic or graphical representation of each unit; Detailed functional and Operating instructions giving safety instructions, precautions, Switching-on and switching off procedures, Tables of fault indication and fault codes etc; Storage, Preservation / Depreservation, Transit Procedure etc.</td>
</tr>
<tr>
<td>(ii)</td>
<td>Technical manual</td>
<td>Covering detailed technical description of each unit with associated drawings and diagrams. It should also include data on Integrated circuits and semiconductor components</td>
</tr>
<tr>
<td>(iii)</td>
<td>Installation manual</td>
<td>Covering composition of equipment, Cabling diagram and cable specifications, Cable connection schedule, Complete binding data, Installation drawings, List of installation materials, List of Accessories, Detailed installation instructions.</td>
</tr>
<tr>
<td>(iv)</td>
<td>Maintenance and Repair manual</td>
<td>Covering Instructions on servicing; Planned Preventive Maintenance; on dismantling and assembling of each unit; Faults, their causes and remedial action; Repair, overhaul &amp; Reconditioning, Testing, adjusting, calibrating and tuning of each unit, List of special tools, test equipment, Jigs and gauge.</td>
</tr>
<tr>
<td>(v)</td>
<td>Maintenance Schedule</td>
<td>Comprehensive Maintenance Schedules are to be provided along with system. These schedules should cover all the relevant aspects and provide the user/maintainer with adequate literature for reference, to prepare the Engg. Support Documents.</td>
</tr>
</tbody>
</table>
| (vi) | Part catalogue, List of spare parts, Test equipment | The manual should include-  
(a) Catalogue of parts listing out all the replaceable parts  
(b) List of On board spares  
(c) List of B&D spares  
(d) List of test equipment  
(e) Service Log Books |
(ix) Instruction on Testing & Tuning and Setting To Work

Containing instructions on Testing and Tuning, alignment, Checking and adjustment to individual parts and of the equipment as a whole.

(xii) 'As Made' drawings

As applicable

(xiii) Test data/certificates

As applicable

(f) Configuration control Documents indicating changes in version to be provided.

9. Binding Data. Three hard copies and two sets on CD ROM of the following binding drawings/ documents are to be supplied by the OEM within 6 weeks of placement of order:

(a) Block diagram of the system

(b) Installation documents covering detailed procedure for installation with sequence of activities.

(c) Installation drawings indicating overall dimensions, C.G., weight, maintenance envelope etc of each unit.

(d) Recommended arrangement of devices in nominated compartments.

(e) Inter unit-cabling diagram with cables specifications.

(f) Cable connection Schedule.

(g) Power supply scheme for the system.

(h) Heat Dissipation of individual units in compartment & in close loop ventilation system, as required for the system.

(j) Parts identification list, indicating part no, qty., maker's name, Specification etc.

(k) Detailed foundation drawing including bolting plan.

10. Shipping. All equipment shall be adequately packed and protected with supports to ensure adequate protection during all modes of transportation. Each unit within a package/container shall be clearly marked for identification. The container shall clearly indicate the item description with caution marks, quantity, weight, size etc. A separate document giving details and instructions for storage, preservations, handling and transportation after delivery is to be supplied. The supplier should indicate the delivery schedule, transport, packing, preservation, insurance etc.
11. **Preservation, Packaging and Shipping.** The stores (including OBS and B&D Spares) shall be supplied in long-term preserved condition that is suitable for storage under tropical high humidity conditions for a period of 24 months.

12. **Part Identification List.** The supplier shall prepare and submit a Parts Identification List (PIL) list, showing exploded views of equipment supplied to the Line Replaceable Unit (LRU) level, which shall include exploded view drawings of all equipment clearly showing how equipment is assembled. All equipment and components shown shall be identified by the supplier part number shown in a tabulated parts list provided with the drawing. The PIL shall be organised such that it supports logical retrieval of data. The PIL description shall be part of the Operator's and Maintenance Manual. The PIL shall be included in the CD-ROM technical manual. (The Parts Identification list that gives the list of items up to LRU level is to be submitted at the time of submission of offer).

13. The requirements mentioned at Para 6,7,8 and 9 are not applicable for COTS equipment.

**Appendix-‘G’**
(Refers to Para 3 of Chapter I)

**SPARES MANAGEMENT SYSTEM AS PER INCAT COMPATIBLE**
**FORMAT**
**(ONLY FOR MARINISED COTS EQUIPMENT)**

**Important:** [Every Spare And Every Part Will Have To Be Supplied With A Part Number (Item Code ) For Merging With ILMS Format]
ILMS means “Integrated Logistics Management System”, which has been in operation in Indian Navy.

In order to operate ILMS successfully, Indian Navy wants all information of all equipment & spares to be provided in a structured format in digital storage media, which is compatible to ILMS. The items must include all on board and base & depot spares.

Some of the information required, are to be provided by OEM and details of requirement is stated in following paragraphs.

All equipment / assembly / sub-assembly / items (kits) must have a part no (item code will be formed out of this part no) and this should be unique.

All manuals, PIL / CPIL & ‘As-made’ drawings also must have part number. Drawing number may be designated as part number. Description for As-made drawings should start with “As-made drawing for………..” to distinguish between item & its drawing.

Part Nos. must not be repeated.

Each equipment drg is to be broken down to assembly, sub-assembly & item level for assigning part numbers.

In case any item has two separate part numbers, one part number. is to be indicated against field “Substitute part number” and substitute type is to be ‘R’. If any item can be replaced by any another item, the second item is to be indicated against field “Substitute part number” and substitute type is to be ‘F’.

All data are to be filled up in Microsoft Access / Excel. The supplier has to furnish the data furnishing as per the ILMS format. ILMS template will be provided to the supplier post placement of the order.

Appendix H
(Refers to Para 3 of Chapter I)

GENERAL STANDARDS AND SPECIFICATIONS
INSTALLATION AND COMMISSIONING
1. **Installation.** Onboard installation of the equipment will be carried out by the Shipbuilder/Yards/Ship. The assistance and responsibilities of the OEM include the following:

   (a) Coordination with the Shipbuilder/Yards/Ship for the installation work.
   (b) Providing instructions to the Shipbuilder/Yards/Ship personnel for installation of the system. Cable laying will be done by the shipbuilder before start of the installation activities.
   (c) Checking of the cable connections (cold wire test).

2. **Testing.** The supplier shall prepare a ATP for each equipment. Personnel from Indian Navy will be present during such trials. The schedule should state how the supplier would demonstrate that the delivered system will meet the functional and performance requirements indicated as per Indian Navy’s SOTR. The factory acceptance trials procedure shall comprise of

   (a) Functional Tests
   (b) Verification of design, test equipment used, calibration requirements
   (c) Pass/Fail criteria
   (d) Expected duration and time schedule

3. All EMI/EMC and Environmental Qualification tests required need to be completed prior to ATP.

4. **System Performance Responsibility.** In case of any irregularities in the operation / performance of the system or non-conformance to specified parameters observed on integration with ships system, the supplier is bound to rectify the defect. The supplier shall ensure complete responsibility of satisfactory operation of the system on board.
Appendix J
(Refers to Para 3 of Chapter I)

GENERAL STANDARDS AND SPECIFICATIONS

PRODUCT SUPPORT

IN Maintenance Philosophy

1. Onboard Repair/ Maintenance. Onboard repair shall be to replacement at Modules (LRU) level. Routine maintenance and serviceability check/terminal performance checks would also be undertaken by ships staff as part of 1st line maintenance.

Product Support from Vendor

2. The supplier should undertake to ensure guaranteed and continuous product support for a period of 15 years from the date of supply of the first system and associated equipment, by way of the following:

   (a) Supply of spare parts and materials.
   (b) Offering of alternative solutions in the event of obsolescence of the components/technologies, including those bought out or subcontracted.
   (c) Continuous up-gradation program.
   (d) Modifications and repairs.
   (e) Provide at least two years notice, in the event of any likely production shut down (only after 10 years of support) to enable procurement of LTE spares.
   (f) Undertake repairs through Annual Maintenance Contract/Rate Contracts as and when directed by the user / IHQ MoD(N).
   (g) Continuous supply of amendments to the documentation.

3. Repair Facilities. If required by the order placing authority, a consolidated test bench to test the modules/PCBs of the light fittings would be required to be provided by the OEM as part of Dockyard Support Package. Beyond first level maintenance facilities on board, the manufacturer would be required to setup requisite advance level maintenance facilities at locations (Naval dockyards) specified by IN as part of the Dockyard Support Package. This requirement if required will be incorporating in the purchase order.

4. Hardware Warranty. The warranty period of equipment (both Marinised COTS/COTS) should be for a duration of 24 months from the date of completion of ATP ofr delivery whichever is later.

5. Training. The Training program objective is to enable the End User Personnel to operate, maintain, and install galley equipment. The Training package is to include the following:-
(a) **Basic Training.** The manufacturer should undertake the responsibility of training naval personnel (including civilian personnel of the yard), as nominated by IHQ/MoD (N), on the exploitation and maintenance of the galley equipment. The duration of training and number of personnel should be worked out by the manufacturer in consultation with IHQ/MoD (N).

(b) **Advanced Training.** If required the manufacturer shall also undertake the training of naval and defence civilian personnel, in carrying out major repairs in the Naval dockyard by using Special Test Equipment/ Special Maintenance Equipment. The training shall include assembling and dissembling of the equipment up to LRU level.

6. **Maintenance.** The manufacturer should forward recommended maintenance schedules for preventive and corrective maintenance of the system within three months of placement of order for necessary approval at IHQ.
**Appendix K**
(Refers to Para 3 of Chapter I)

<table>
<thead>
<tr>
<th>Protection against solid foreign objects</th>
<th>First characteristic numeral</th>
<th>Degree of protection for people against access to hazardous parts with:</th>
<th>Protection against harmful ingress of water</th>
<th>Second characteristic numeral</th>
<th>Degree of protection from water</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.P. Example</td>
<td>TESTS</td>
<td></td>
<td>I.P. Example</td>
<td>TESTS</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>No protection</td>
<td>Non-protected</td>
<td>0</td>
<td>No protection</td>
<td>Non-protected</td>
</tr>
<tr>
<td>1</td>
<td>Full penetration of 50mm diameter of sphere not allowed. Contact with hazardous parts not permitted.</td>
<td>Back of hand</td>
<td>1</td>
<td>Protected against vertically falling drops of water</td>
<td>Vertically dripping</td>
</tr>
<tr>
<td>2</td>
<td>Full penetration of 12.5mm diameter of sphere not allowed. The jointed test finger shall have adequate clearance from hazardous parts.</td>
<td>Finger</td>
<td>2</td>
<td>Protected against vertically falling drops of water with enclosure tilted 15° from the vertical.</td>
<td>Dripping up to 15° from the vertical</td>
</tr>
<tr>
<td>3</td>
<td>The access probe of 2.5mm diameter shall not penetrate.</td>
<td>Tool</td>
<td>3</td>
<td>Protected against sprays to 60° from the vertical.</td>
<td>Limited spraying</td>
</tr>
<tr>
<td>4</td>
<td>The access probe of 1mm diameter shall not penetrate.</td>
<td>Wire</td>
<td>4</td>
<td>Protected against water splashed from all directions – limited ingress permitted</td>
<td>Splashing from all directions</td>
</tr>
<tr>
<td>5</td>
<td>Limited ingress of dust permitted (no harmful deposit).</td>
<td>Dust protected</td>
<td>5</td>
<td>Protected against low pressure jets of water from all directions – limited ingress permitted</td>
<td>Hosing jets from all directions</td>
</tr>
<tr>
<td>6</td>
<td>No ingress of dust.</td>
<td>Dust tight</td>
<td>6</td>
<td>Protected against strong jets of water eg for use on ship decks – limited ingress permitted</td>
<td>Strong hosing jets from all directions</td>
</tr>
<tr>
<td>7</td>
<td>Protected against the effects of immersion between 150mm and 1m</td>
<td>Temporary immersion</td>
<td>8</td>
<td>Protected against continuous submersion at a specified depth.</td>
<td>Continuous immersion</td>
</tr>
</tbody>
</table>
Appendix L
(Refers to Para 3 of Chapter I)

SCOPE OF DELIVERABLES BY VENDORS FOR GALLEY EQUIPMENT

1. The Vendor would have to supply the galley equipment as per the quantity specified in the Purchase Order. A firm Bill of Material containing all items including cables, shock mounts, installation materials and accessories shall be submitted by the OEM.

<table>
<thead>
<tr>
<th>Sno.</th>
<th>Type of Equipment</th>
<th>Specification</th>
<th>Quantity /Patt NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Shock Mount (as applicable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Cables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td>Installation Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e)</td>
<td>Tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(f)</td>
<td>Documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(g)</td>
<td>Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any other items which are costed</td>
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<td></td>
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</tbody>
</table>