



**MAZAGON DOCK SHIPBUILDERS LIMITED**

(Formerly known as Mazagon Dock Ltd.)

**CIN: U35100M**

**H1934GOI002079**

(A Government of India Undertaking)

Dockyard Road, Mazgaon, Mumbai 400010. India.

Certified – ISO 9001:2008 for Shipbuilding Division

Website: [www.mazagondock.in](http://www.mazagondock.in)

**EXPRESSION OF INTEREST (EOI)**

Department : Planning Additional Project – East Yard  
E-mail ID : [gjadav@mazdock.com](mailto:gjadav@mazdock.com)  
Phone no. : 022 – 23763596  
Fax : 022 - 23724654  
  
EOI no. EOI : EY/PLG/AP/EOI-LIB/0003  
date : 07 June 2022  
EOI closing date & time : 15 June 2022, 15:00 Hrs

**Expression of Interest (Eoi)**

**Design, Development and Supply of Lithium Ion Battery system along  
with Battery Monitoring System for underwater platforms**

अंडरवाटर प्लेटफॉर्म के लिए लिथियम आयन बैटरी सिस्टम के साथ बैटरी मॉनीटरिंग सिस्टम का  
रूपांकन, विकास एवं आपूर्ति

LETTER OF INVITATION

Mazagon Dock Shipbuilders Limited (MDL) seeks response from companies meeting the requirements of this EOI for design, development and supply of Lithium Ion Battery system solution for underwater platform.

The participating firm should be in a position to design, engineer, manufacture, test and supply. The detailed terms and conditions shall be mutually agreed upon.

Firms shall be shortlisted based on the technical, commercial and financial evaluation as depicted in this EOI. There may be a MOU Agreement with the selected firm or limited tender will be floated among the shortlisted firms.

INDEX

Sl. No.	DESCRIPTION
1	SECTION - 1: DISCLAIMER
2	SECTION – 2: SCHEDULE OF EOI PROCESS & CONTACT DETAILS
3	SECTION – 3: DETAILS OF EOI
4	SECTION – 4: PRE-QUALIFICATION CRITERIA
5	SECTION – 5: DOCUMENTS TO BE SUBMITTED ALONG WITH EOI

**SECTION-1**

**DISCLAIMER**

1. MDL, its employees and advisors make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of the EoI document.
2. MDL may, in its absolute discretion, but without being under any obligation to do so, modify, amend or supplement the information in this EoI document.
3. The issue of this EoI does not imply that MDL is bound to select and shortlist any or all the participating firm. Even after selection of suitable participating firm, MDL is not bound to proceed ahead with the participating firm and in no case be responsible or liable for any commercial and consequential liabilities in any manner whatsoever.
4. The participating firm shall bear all costs associated with the preparation, technical discussion/presentation and submission of EoI. MDL shall in no case be responsible or liable for these costs regardless of the conduct or outcome of the EoI process.
5. Canvassing in any form by the participating firm or by any other agency on their behalf shall lead to disqualification of their EoI.

**SECTION-2****SCHEDULE OF EOI PROCESS & CONTACT DETAILS****A. SCHEDULE OF EOI PROCESS**

The schedule of activities during the Eoi Process shall be as follows -

Sl. No.	Description	Date
1	Issue of Eoi document	07-06-2022
2	Last date of Submission of Eoi response	15-06-2022

**B. CONTACT DETAILS:****Submission of proposal:**

Proposal (**Original + one soft copy**) super scribing the enquiry number, enquiry subject, last date for receipt of EOI and shall be addressed to

Mr. Girish Jadav,  
HoS/DGM (Additional Projects, Planning-EY),  
4<sup>th</sup> Floor, Reclamation Building  
Mazagon Dock Shipbuilders Limited, Dockyard  
road, Mumbai 400010  
E-Mail: [gjadav@mazdock.com](mailto:gjadav@mazdock.com)

**All the correspondences shall be addressed to Mr. GirishJadav, DGM (Addl. Projects-EY) and following shall also be marked in cc:**

i) Mr. Sivaiah Midde

Assistant Manager (Plg-EY)  
E-Mail: [sivaiahmidde@mazdock.com](mailto:sivaiahmidde@mazdock.com)

ii) Mr. Kapil Arora

Deputy Manager (Plg-EY)  
E-Mail: [karora@mazdock.com](mailto:karora@mazdock.com)

## SECTION – 3

### DETAILS OF EXPRESSION OF INTEREST (Eoi)

#### 3.1. ABOUT MDL

Mazagon Dock Shipbuilders Limited (MDL) is a leading submarine and shipbuilding company in the country with a Miniratna Category-1. The company was taken over by the Government of India and established as a Public Sector Undertaking under the Ministry of Defence in 1960. Over the last six decades, MDL has delivered over 250 warships/submarines/ platforms to various customers in India and abroad. Out of these 30 major warships/submarines have been delivered to the Indian Navy. The diversified platforms delivered to various customers range from Destroyers, Stealth Frigates, Submarines, Missile Boats, Corvettes, Offshore Patrol Vessels, Multipurpose Support Vessels, Offshore Supply Vessels, Dredgers, Tugs and Cargo-Cum-Passenger Vessels.

#### 3.2. TECHNICAL REQUIREMENT

##### 3.2.1. Aim

To design, develop and supply of Lithium Ion Battery (LIB) System solutions for underwater platforms. The total capacity of LIB system is envisaged to be not less than 200 KWh with a scalable requirement as necessary to at least 1000KWh.

##### 3.2.2. Scope of Project

- 3.2.2.1. Design, development and supply of a LIB System for proposed volume of battery space of a platform.
- 3.2.2.2. Selection and characterization of Lithium Ion Chemistry for making a cell that would provide maximum capacity and robust safety.
- 3.2.2.3. Design and development of system (arrangement of Li Ion cells in parallel or series, connectorization, cooling line integration, fire safety).
- 3.2.2.4. Design and development of the Battery Monitoring System (BMS)
- 3.2.2.5. Design of suitable Battery charger for the Energy Storage System (ESS)
- 3.2.2.6. Development of acceptance test protocol for the Lithium Ion Battery Module.
- 3.2.2.7. Charge and discharge characterization of the LIB along with the BMS.
- 3.2.2.8. Design and development of cooling system of batteries for safe and efficient operation.

##### 3.2.3. Capacity of LIB system

The number of cells can vary depending on the total voltage requirement of LIB system which is considered to be from 280V (minimum) – 410VDC (maximum). All the modules would be connected in parallel/series to achieve the same LIB system Voltage.

##### 3.2.4. Sourcing of Li Ion Cells

The design is to be based on either imported / indigenous Li Ion cells. The choice of chemistry of the Li Ion cells along with report for testing and evaluation need

to be submitted along with the design documents.

### 3.2.5. Configuration of Cells inside Modules

The configuration of the Li ion cells inside a LIB module is to be chosen such that it meets the overall voltage level requirements (280V (minimum) – 410VDC (maximum)). Module should be made fire and explosion proof in case of failure of any cells inside.

### 3.2.6. Battery Management System (BMS)

BMS is to include sensors for current, Voltage and temperature monitoring along with switch gear arrangement for isolation of erratic cells/sub-module /module and short circuit protection device for the module. The BMS design has to cater for safe exploitation during charging and discharge cycles of the module. Based on the operational parameters for the constituent Li ion cells, the BMS has to cater for continuous monitoring of parameters, auto balancing of voltage and implement a protection sequence with graduated mode of evolution from warning to isolation of erratic cells/ sub module/ module. The BMS has to display exploitation parameters of the cells and facilitate active monitoring/ intervention in case if required. The BMS has to record parameters and generate advice wrt to state of charge of the module during charging/ discharging of the battery. The design therefore has to cater for an integrated BMS in the module and Interactive central and display unit. The design architecture of the BMS is required to fulfill requirement of end user.

### 3.2.7. Safety and Protection Design.

The following safety aspects are to be catered to in the design: -

- 3.2.7.1. **Cell Type:** The choice of chemistry of the Li Ion cells must consider maximum performance at the required voltage with a focus on safety in aspects of explosion, fire, gas emissions, etc.
- 3.2.7.2. **Cell level:** The Li Ion cell to be selected with a safety vent and overcharge safety device.
- 3.2.7.3. **Module level:** The LIB module has been integrated with a management device along with a power relay assembly device. The casing of module is to be of fire-explosion proof in case of failure of any cells inside.
- 3.2.7.4. **System level:** The battery management system is to provide management for string of modules along with short circuit protection, over-charge protection and any fire explosion protection device.
- 3.2.7.5. **Medium inside module:** Integration of cells inside module should include aqueous/gelatic solution which acts as both cooling and fire-retardant medium.
- 3.2.7.6. **Cooling line:** Effective temperature management by cooling system to prevent thermal runaway of the batteries.
- 3.2.7.7. **Gas monitoring devices:** List of gases with percentages evolved from the cells during charging and discharging levels are to be mentioned. Devices for detecting, monitoring these gases are to be listed.
- 3.2.7.8. **Operational Environment:** The battery packs will be in an isolated, sealed battery pit environment with no air flow. All cooling will be carried out using fresh water or coolant flow via cooling inlet/outlet. Any other similar procedure may also be used.
- 3.2.7.9. **Alarm system:** BMS should initiate alarms for any abnormal conditions of

battery system as stated below:

- high cell or module temperature
- over and under voltage
- battery disconnection
- failure of temperature/voltage sensors
- tripping of battery breakers/contactors
- communication alarm
- liquid cooling leakage
- other safety protection functions.

### **3.2.8. Type test Verifications and Acceptance**

All test mentioned below will be witnessed by MDL and/or a third party representative nominated by MDL.

**3.2.8.1. Lithium-ion cell tests:** All the cell tests shall be performed at a recognized laboratory and following tests will be required for lithium ion cells:

- a. External short Circuit
- b. Internal short Circuit test/Nail Penetration test
- c. Impact
- d. Thermal Abuse
- e. Forced Discharge

**3.2.8.2. Lithium-ion battery system tests:** The following tests will be conducted at the lithium ion battery system level with respect to their relevant standards ( IEC or MIL as required will be indicated at the time of tender floating) :

- a. Drop Test
- b. Overcharge test
- c. Internal short-circuit test/Propagation test
- d. Overcharge control of voltage
- e. Overcharge control of current
- f. Overheating control
- g. Discharge performance (rated capacity check)
- h. Charge retention and recovery (self-discharge)
- i. Cell and battery internal resistance
- j. Endurance
- k. Cell balancing
- l. SOC validation
- m. BMS safety function tests
- n. Cooling failure test
- o. Pressure test of coolant piping/hoses
- p. Di electrical strength (High voltage test)
- q. Sensor failure
- r. Tests based on FMEA
- s. Functional tests of control, monitoring, alarm and safety system
- t. IP Verification, as declared by the Manufacturer
- u. Gas Analysis

### **3.3. SCOPE OF ASSOCIATION:**

**3.3.1.** MDL is seeking response from companies willing for design, development and supply of a Lithium Ion Battery solution for underwater platforms.

**3.3.2.** Duly registered companies (in the country of their existing operations) or



consortium of companies can participate in the EoI. In case of consortium, clarity on roles and responsibilities of the consortium members shall be provided.

- 3.3.3.** The participating firm must possess necessary knowledge of the field of collaboration.
- 3.3.4.** The participating firm must possess technology of the area of collaboration.
- 3.3.5.** The technology possessed by participating firm must be non-infringing while delivering the desired performance and it must be clear from third-party IP infringement claims.
- 3.3.6.** The participating firm if foreigner should be willing to meet 60% of “Make in India” initiative.
- 3.3.7.** Interested companies meeting the Pre-Qualification Requirements (PQR) as given in Section-4 and ready to associate with MDL as per broad scope/ expectations given above are invited to submit their offer in response to this EoI.
- 3.3.8.** Upon receipt of responses against this EoI, MDL will review the responses to ascertain suitability of the offer and shortlist participating firm for further discussions. Detailed discussions on commercial and other terms and conditions to finalize the Agreement shall be held with shortlisted participating firm. The detailed terms and conditions for agreement shall be mutually agreed upon. If more than one valid responses are there, then subsequently, tender will be issued only to these shortlisted firms through Limited Tender Enquiry (LTE). The shortlisted firm will also be required to sign a Non-Disclosure Agreement (NDA) regarding the confidentiality of Techno Commercial Aspects.

**3.4. INSTRUCTIONS**

- 3.4.1.** Language: All correspondences and documents related to the EoI response shall be in English language only.
- 3.4.2.** The participating firm shall abide by the terms & conditions, as applicable, of the EoI.
- 3.4.3.** All pages of the EoI shall be duly signed by the authorized signatory.
- 3.4.4.** Multiple proposals from the same participating firm should not be submitted.
- 3.4.5.** MDL at their discretion shall inspect the participating firm works/office/reference site premises for the purpose of evaluation, as deemed necessary before selection of partner. MDL decision in this regard shall be final.
- 3.4.6.** Any participating firm which has been debarred/blacklisted by Central/State Governments or by any entity controlled by Central/State Governments from participating in any of their project, as on date of submission of EoI, shall not be eligible to submit the EoI.

**3.5. PROCESS TO BE CONFIDENTIAL:**

Information relating to the examination, clarification, evaluation and comparison of EoI and recommendations shall not be disclosed to participating firm. Any effort by participating firm to influence MDL processing of EoI or selection decisions may result in the rejection of the EoI.

**3.6. MISCELLANEOUS:**

**3.6.1. Right to accept or reject any or all Applications:**

- I. Notwithstanding anything contained in this EoI, MDL reserves the right to accept or reject any application and to annul the EoI process and reject all applications, at any time without any liability or any obligation for such acceptance, rejection or annulment and without assigning any reasons, thereof. In the event that MDL rejects or annuls all the applications, it may at its discretion, invite all eligible participating firms to submit fresh applications.

- II. MDL reserves the right to disqualify any applicant during or after completion of EoI process, if it is found there was a material misrepresentation by any such applicant or the applicant fails to provide within the specified time, supplemental information sought by MDL.
- III. MDL reserves the right to verify all statements, information and documents submitted by the applicant in response to the EoI. Any such verification or lack of such verification by MDL shall not relieve the applicant of his obligations or liabilities hereunder nor will it affect any rights of MDL.

**3.6.2. Governing Laws & Jurisdiction:**

The EoI process shall be governed by, and construed in accordance with, the laws of India and the Courts at Mumbai (India) shall have exclusive jurisdiction over all disputes arising under, pursuant to and / or in connection with the EoI process.

**SECTION– 4**

**PRE-QUALIFICATION CRITERIA**

The determination of eligibility will take into account the technical and experience capabilities and past performance of the participating firm; it will be based upon an examination of documentary evidence of the participating firm qualifications submitted by the participating firm as well as such other information, as the MDL deems necessary and appropriate. The participating firm willing to associate with MDL should meet the following Pre-Qualification Criteria:

**4.1. TECHNICAL QUALIFICATION: -**

The bidder shall submit the following as a part of technical qualification.

- i. Bidders Company Profile.
- ii. List of infrastructure/equipment's held by firm which shall include but not limited to R&D / product development facility, Manufacturing Facility, Quality Control and Testing Facility
- iii. Bidder must have an experienced design team with experience in the design of Lithium Ion battery packs for marine platforms or automobiles with a minimum capacity as mentioned below. Firm should also have expertise in BMS or similar testing/monitoring equipment design.
- iv. Bidder to submit relevant documents for similar products/projects/CoC/ work performed during the last 05 years. Documents should mention: Application, Type of Cell, Type of Battery and Energy Installation. Installation must be a minimum of 50 kWh, with a minimum 60% indigenization on work carried out. Firm to submit PO copies along with work completion documents in support of above.
- v. Colour photographs no less than 2 months old of the facility demonstrating the above must be submitted as part of the EOI response.
- vi. List of personnel (Project Management Team as well as Design Team) with designation, qualification and experience to determine their capabilities to carry out work mentioned in the scope of this EOI.
- vii. Valid ISO 9001:2015 Certificate
- viii. Should be willing to undertake cell level and system level testing of claimed

parameters at any NABL accredited Lab and should be willing to submit a sample module for verification trials by end user if requested.

The Technical Qualification documents submitted shall demonstrate capability of firm to design, develop and supply Lithium Ion battery solutions to meet following specifications:

- a. Warranted life in cycles at 80 % Discharge on Demand (DoD):2000
- b. Cell Ah rating: 50 Ah and above (preferable 100Ah and above)
- c. Operating temperature: -10 to 55 degrees C
- d. Thermal Runaway: > 55 Degrees
- e. Self-discharge per month at ambient temp up to 25 Degrees C: < 5 %
- f. Cell and Module is required to be explosion proof when uncharged and in charged condition using short circuit test. Firm to fill specification of battery developed by them at Annexure 3.

**4.2. COMMERCIAL QUALIFICATION:** - The bidder shall submit the following as a part of commercial qualification.

**4.2.1.** Bidder shall not be under a declaration of ineligibility issued by Govt. of India / State govt. / Public Sector Undertakings etc.

**4.2.2. Indian Bidder:**

- i. Shop & Establishment registration certificate.
- ii. Factory License.
- iii. Certificate of Incorporation / Partnership deed as applicable.
- iv. Registration certificate from local bodies for conducting business.
- v. MSME, Startup certificate
- vi. GST certificate

**Foreign Bidder:** Registration certificate for conducting business as relevant.

**4.3. FINANCIAL QUALIFICATION: -**

- i. Shall have Average Annual turnover of Rs.70 lakh (min) or equivalent Foreign currency during the last three years ending as on 31 Mar 2022 to participate in this EOI.
- ii. The Bidder shall enclose with its Proposal as per **Annexure-2**, certificate issued by Chartered Accountant with their seal and signature, stating the firms net worth & turnover during the past three years. Firm to submit Balance Sheet and Profit and Loss statement for last 3 years.
- iii. Bidder shall demonstrate access to unutilized line of credit / overdraft facility / cash credit facility from its consortium of banks. Alternatively, or complementarily should demonstrate liquid asset in form of cash / marketable securities in its balancesheet.
- iv. Companies / Start-ups may be relaxed for conditions of turnover, experience (PO copies), Infrastructure etc. offering proven innovative product / technology having Business prospects. MDL reserves right to consider or reject based on merits of such proposal.

**SECTION- 5**

**Bid Rejection Criteria:** - MDL may at its sole discretion and at any time during the evaluation of proposal, disqualify any bidder, if they have:

- i. Bids received after due date.
- ii. Bidder's failure to furnish sufficient or complete details for evaluation of the bids within the given period.
- iii. Incomplete / misleading / false / ambiguous in the proof of eligibility requirements.
- iv. Failed to produce timely clarifications related thereto, when sought.
- v. Bids not meeting qualification criteria mentioned above.
- vi. Submitted more than one proposal for single specialization area.
- vii. Declared ineligible by the Government of India / State govt. / Public sector undertaking.
- viii. Bids with technical requirements and or terms not acceptable to MDL.
- ix. Information relating to the evaluation, clarification and recommendation for pre-qualification shall not be disclosed to bidders or any other persons not officially concerned with such process until the pre-qualification process is completed. Any effort by the bidder to influence MDL prequalification process may result in rejection of his EOI.

**SECTION- 6**

Documents to be submitted along with Eoi\*

**6.1. Submission of Eoi:** - List of documents to be submitted as part of Eoi:

Participating firm should submit following documents along with their Proposal.

Sl.	Document Description	Filled in Formats to be Submitted with Proposal	Remarks
1.	Covering Letter		As per attached format
2.	General information	Annexure-1	
3.	Financial Information	Annexure-2	
4.	Specification of Lithium Ion Battery developed by Firm (To be filled by firm)	Annexure-3	
5.	Questions	Annexure-4	
6.	Pre-Qualification Documents and photographs		As per section-4

7.	Documents / Presentation in support of area of collaboration		
----	--	--	--

\*In case of consortium, same to be provided for constituent companies of consortium.

EoI FORMS

Format for Covering Letter  
*[On the Letterhead of the Participating firm]*

To,

Mr. Girish Jadav,  
HoS/DGM  
(Additional Projects, Plg-  
EY)  
Mazagon Dock Shipbuilders Limited  
(MDL), Mumbai-400010, India.  
Contact No- 022-23763591/3596,  
E-Mail: [gjadav@mazdock.com](mailto:gjadav@mazdock.com) /[sivaiahmidde@mazdock.com](mailto:sivaiahmidde@mazdock.com)

**Ref: Submission of Expression of Interest (Eoi)**

Sir,

Being duly authorized to represent and act on behalf of ..... (Hereinafter Referred to as "the Applicant"), and having reviewed and fully understood the evaluation criteria and information provided, the undersigned hereby applies in response to the Eoi document.

**We would like to associate with MDL for Lithium Ion Battery system solution for underwater platform.**

We understand that you are not bound to accept the Eoi.

I am enclosing the Expression of Interest with the details as per the requirements of the Eoi document, for your evaluation.

I hereby declare that the details furnished in this Eoi proposal are true and correct to the best of my knowledge and belief. In case any of the information is found to be false or untrue or misleading or misrepresenting, I am aware that I will be held liable for it and MDL is free to take any legal / commercial action not limited to barring / blacklisting.

We hereby declare that we are not under a declaration of ineligibility / blacklisting / debarring from doing business issued by Govt. of India / State govt. / Public Sector Undertakings etc.

Yours faithfully,

\_\_\_\_\_  
(Signature & Seal of Authorised Signatory) Name:

Designation: Date:

Address:

General Information to be submitted by Applicant along with cover letter

1. Name of the Company/ Companies (if consortium):
2. Legal status of the Company(ies):
3. Brief description of the Company(ies) including details of its business groups/subsidiaries/ affiliates:
4. Date of Incorporation:
5. Date of Commencement of Business:
6. Full address including Telephone nos. / Fax nos.:  
Registered Office:  
Head Office:  
Address for communication:  
Contact Details:  
Office Address in India, if any:
7. Documents to be enclosed:
  - a. As per pre-qualification criteria

Signature & Seal: Authorized  
Signatory of the Party



## FINANCIAL INFORMATION

Date:

Name:

Financial data:

Sl. No.	Last three Financial Year	Annual Turnover	Profit after Tax (PAT)	Net worth as at the end of the financial year
1				
2				
3				

Exchange rate for conversion to INR shall be as published by Reserve Bank of India as on date of floating EoI. \*

## 2. Financial documents#

The participating firm shall provide copies of the financial statements including balance sheets all notes and related income statements for latest 3 years.

The financial statements shall:

- Reflect the financial situation of the participating firm submitting EoI.
- Be audited by a certified accountant.
- Be complete, including all notes to the financial statements.
- Correspond to accounting periods already completed and audited (no statements for partial periods shall be accepted).

#In case of consortium, same to be provided for constituent companies of the consortium.

(Signature  
& Seal) Authorised  
Signatory of the Party

**Certificate from Chartered Accountant:**

This is to certify that \_\_\_\_\_ (name of the Applicant) has received the payments shown above against the respective years and that the net worth is as computed.

**Name of the Authorized Signatory representing Auditing firm: Designation:**

**Name of firm  
(Chartered Accountant):  
Signature of the Authorized  
Signatory**

**Seal of Audit firm**

**Specification of Lithium Ion Battery developed by Firm  
(To be filled by firm)**

**1.1 Module**

Battery Module	
<b>Electrical</b>	
Cell type and Chemistry	
Configuration	
Capacity (Nominal)	
Voltage (Nominal)	
Energy (Nominal)	
Standard Charge Condition	
Standard Discharge Condition	
Internal / external Communication Type	CAN / LAN / RS485
Cooling	Aqueous/Gelatic solution and Fresh water cooling
<b>Usable Pattern</b>	
Charge end Voltage	
Discharge end Voltage	
Max Charge Current	
Max Discharge Power	
<b>Environmental</b>	
Operating Temperature	-5 ~ 55°C
Operating Humidity	0 ~ 100 % RH
Recommend Operating Temperature	23±3°C
Noise Level	65dB(A)
Storage Temperature	~ 7days      -30 ~ 60°C
	~ 6months    -20 ~ 45°C

Mechanical	
Cell Dimension	
Cell Weight	
Module Dimension	
Module Weight	
Enclosure Material specification	

**1.2 Battery Protection Unit (BPU)**

ELECTRICAL SPECIFICATION

MODEL		
Main DC	Voltage	
	Current (Rated)	
Fan power / Aux power	Voltage Range	
	Power Consumption	

MECHANICAL SPECIFICATION

Housing Material		
Dimension (W x D x H)	SMPS BOX	
	BPU	
Unit Weight	SMPS BOX	
	BPU	
Indicator	Status	
Cooling System		
Main DC Terminal		
Control Power Housing	Upper	
	Lower	
E-STOP Input Terminal		
Main DC Wire		

PROTECTION

Over/Under Voltage	
Over Current	
Over Temperature	
Over/Under SOC	
Short Circuit	
Inrush Current	

OPERATING ENVIRONMENT

Storage temperature	
Operating Temperature Range	
Recommended Operating Temperature	
Operating Humidity	
Operating Altitude	
Pollution Degree	
Warranty	

**Annexure 4**

**Questions:**

- 1) Whether firm has developed Marine Grade Lithium Ion Battery?
- 2) Whether firm has developed/is developing Lithium Ion Battery for automobiles or marine platforms in the past?
- 3) Whether firm is willing to 60% Indigenize the production of Lithium Ion Battery?
- 4) Whether firm is willing for Transfer of Technology (TOT) to MDL?
- 5) Whether firm is willing to hold joint patents with MDL for technology developed during the association?