EXPRESSION OF INTEREST DOCUMENT

DEVELOPMENT OF UNIVERSAL VERTICAL LAUNCHER MODULE (UVLM-8)

1.0 **About BrahMos Aerospace:**

BrahMos Aerospace Private Limited is a Joint Venture Company of DRDO, Ministry of Defence. We are inviting interests from firms to provide Universal Vertical Launcher Module (UVLM-8) on board Naval warships. Brief description and scope of work for VLU system is placed as Enclosure-I (6 Pages).

2.0 **Procedure to be followed during the Award of Contract:** The firms interested in undertaking the above activities will need to follow the following steps:

(i) Send the Vendor Assessment Form to BAPL via e-mail

(ii) Based on the Vendor Assessment, BAPL will invite all the prospective bidders to BAPL, New Delhi for a meeting (Being a sensitive Defence Location, the exact details of equipment will be made available during the meeting and subsequent RFP).

(iii) Based on the Vendor Assessment by Company Officials and site visit, RFP will be issued to shortlisted firms.

(iv) Based on participation during the bid process (Two Stage: Techno Commercial Bids and Price Bids), firms quoting will be invited for Technical and Commercial Evaluation. The Techno Commercial Evaluation will be carried out on the basis of Quality Cum Cost Basis.

(v) Based on Technical and Commercial Evaluation, technically competent firms will be invited for Cost Negotiation Committee. The Price Bids will be opened in front of all the participating firms.

(vi) Based on the Quality and Price (L1), Purchase Order (PO) will be placed on the Vendor for Development of VLU

(vii) This EoI is not an agreement for Production Order of the System.

3.0 **Contact Persons for the Requirement:**

(a) Interested firms will send the Vendor Registration Cum Assessment Forms at the following Mail Id by 30 Jun 25.

contracts@brahmos.com

(b) The site visits will be co ordinated by the following official:

AGM (Design) (Mr Abhineet Kaushik)

BRAHMOS Head Quarters Complex

Delhi Cantt, New Delhi (mail id design@brahmos.com)

BrahMos Aerospace Pvt Ltd. New Delhi

The site visits needs to be completed within Seven Working Days after the Pre – Qualification is intimated to the firms. In case the applying firm does not qualify the Pre – Qualification, no intimation will be made to them.

4.0 **Vendor Registration Cum Assessment**:

The Vendor Registration Cum Assessment Form is uploaded along with this Notice Inviting Pre – Qualification on our Website.

5.0 The **decision regarding the selection / rejection** will be at the sole discretion of **Procuring Entity** i.e. BrahMos Aerospace Private Limited.

6.0 The firms will be selected on the following criteria:

SN	Selection Criteria in the RFP	Applicability
1	Experience of Previous Services	(1) Firms should have provided similar services in Ministry of Defence / DRDO / Public Sector Enterprises of similar nature in terms of both Size and Scale. (2) Firms enlisted in the above must forward their Certificate of Enlistment along with the Vendor Registration cum Assessment Form. (3) If not the above, the firm must have all the facilities asa outlined at Enclosure II.
2	Technical Criteria	Refer Enclosure II.(1 Page)
3	Financial Commitment	(1) Firms should possess adequate financial resources to fund the development Purchase order and subsequent production order. (2) The financial criteria will be made available as part of RFP.
4	Statutory and Legal Requirements	(1). The firm must meet all the statutory and legal requirement of an engineering firm.

SN	Selection Criteria in the RFP	Applicability
		(2) In furtherance, all the laws existing for Labour and in due course the changes need to be adhered by the Firms.
5	Taxation	(1) The firms must provide GST registration and Valid PAN Number. (2) If the firm is MSME, the firm needs to forward the details as per the Vendor Registration cum Assessment form
6	Disqualified Candidates	Firms debarred by Government of India or any allied departments will be automatically debarred from the Selection Process.

7.0 Adherence to timelines: Non – Adherence to these timelines will automatically dis qualify the firms.

8.0 BrahMos Aerospace Private Limited looks forward for interested firms in doing business with us. We believe in conduct of our procurement in a free, fair, transparent and equitable way as enshrined in the constitution of India.

(Abhishek Panigrahi)
Additional General Manager
Commercial

Abhishek Panigrahi
AGM (Commercial - Production Control)
BrahMos Aerospace

BrahMos Aerospace Pvt. Ltd. New Delhi

BRIEF DESCRIPTION & SCOPE OF WORK FOR VLU SYSTEM

1. VLU Configuration

VLU ensures storage and operation of 08 cylinders in 4x2 configuration. VLU is capable of being installed on any ship without major changes to the main sub-systems. It is possible to install VLU in different orientations with respect to the center line of the ship. VLU needs electric power supply for running its dedicated hydraulic power pack which is used to operate the hatch covers installed on its top structure. Approx. 20kw power used by the system is drawn from ship's power supply system.

1.1 Principal Parameters:

(a) VLU has 8 cells. Each cylinder is housed in its individual cell.

(b) Dimensions of frame structure of VLU unit are 4020 (Length) x 2060mm (width) x 9304mm(height) approx.

(c) Total weight of one VLU with its cylinders is 50 Ton approx.

(d) VLU can be installed on a carrier with its length along fore and aft line of ship or perpendicular to it. The modules are generally oriented in such a way that the module is placed symmetrical about fore-aft axis. However, the modules can be placed in any convenient way if the ship structure can withstand the reactions.

(e) Electrical supply to the equipment of VLU is drawn from ship's general electrical supply.

1.2 Constituents

VLU has following principal constituents: (refer fig 1.1 and 1.2)

(i) VLU Structure

(ii) Hydraulic Power Pack

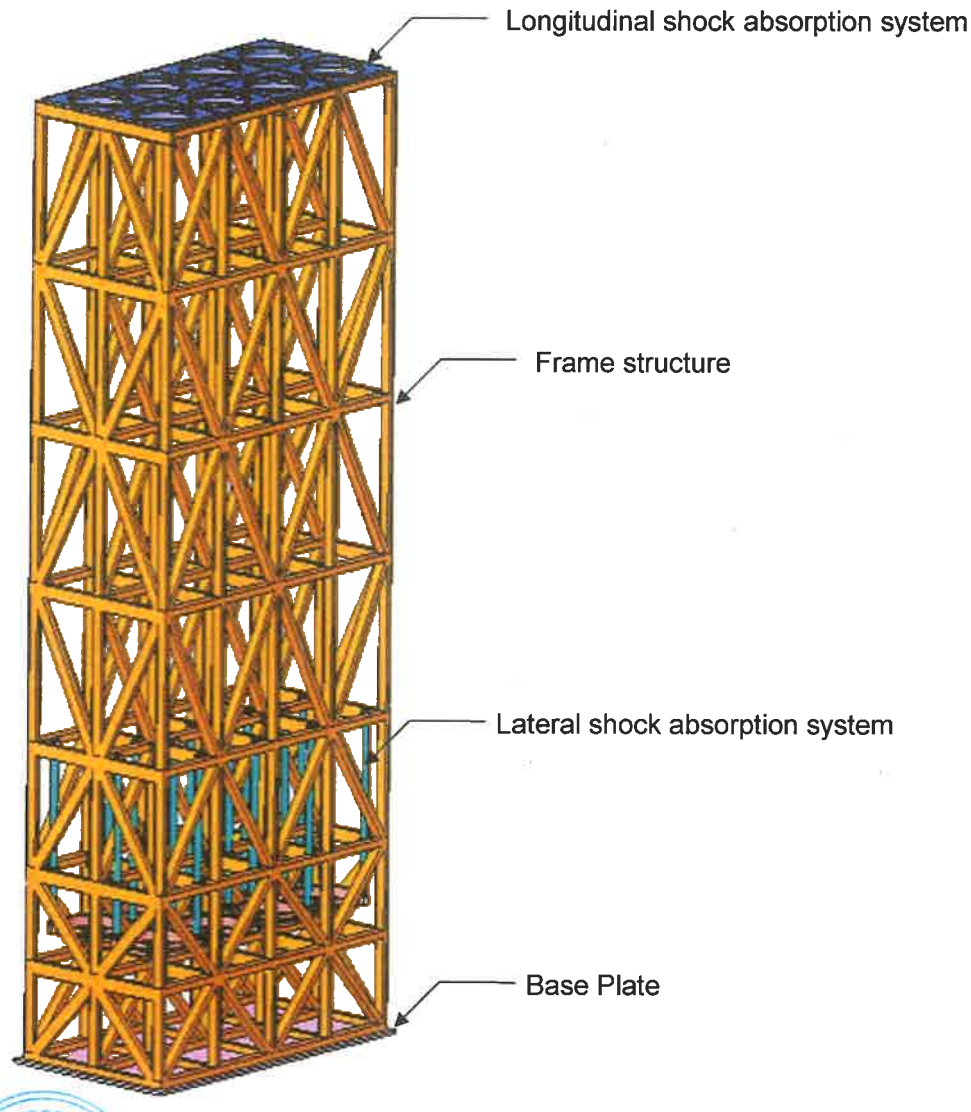
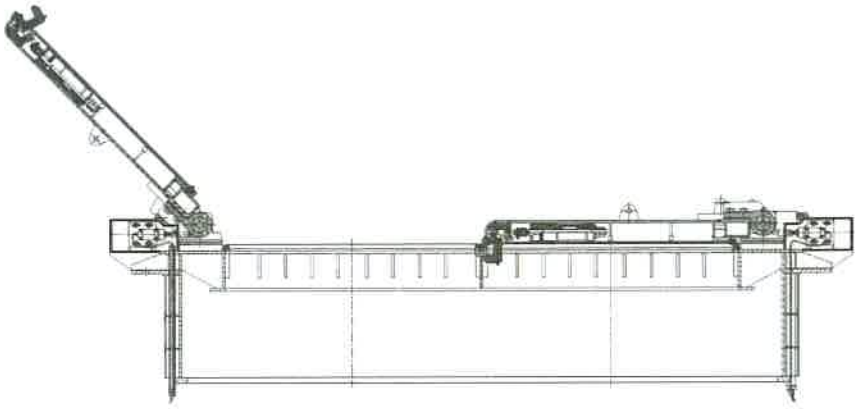


Fig 1.1 VLU Structure with Assembled Sub systems



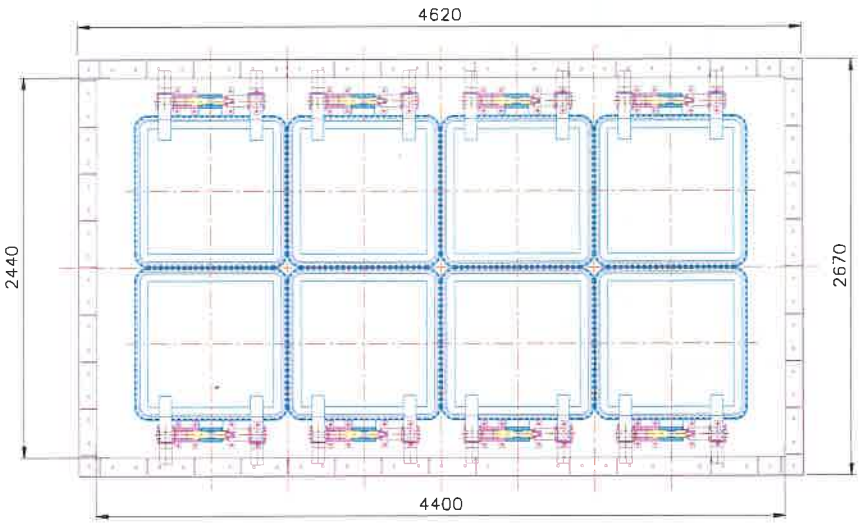


Fig 1.2 Top Support Structure

2. Operational conditions of VLU

VLU design should ensure operational readiness in the following conditions:

a) Atmospheric temperature – from minus 10°C to +45°C (up to 60°C close to heated deck structure) at a relative atmospheric humidity of up to 98% at +40°C.
b) At temperature of sea water – from minus 2°C to +35°C.
c) In any meteorological conditions (rain, snow, fog) any time of the day and year.
d) Under the influence of sea fog and high concentration of salt up to 2-3g/M^3.
e) At wind speed of up to 20m/s from any direction to the point of launch.
f) In icy conditions with ice thickness of up to 50mm on the external surface of the upper platform and hatches of VLU.
g) In conditions of radio-active, chemical and bacterial contamination of atmosphere.
h) At ship velocity 35 knots on any heading.
i) VLU will comply with MIL standard 461E/F.
j) Automatic and manual control and operation of the systems and mechanisms of VLU will be ensured.
k) Control mechanism for opening of the hatch will be operated from:

- For cylinder launch – from control system in automatic mode:
- While loading and unloading of anti-ship cylinder from stationary or portable control panel of VLU or in the absence of electric supply from ship by manual hydraulic pump.

3. Power Supply

In automatic mode 24V supply is fed from control system while in manual mode it is available locally.

System needs following power supply for its operation

Supply Volt	415 V / 380 V ± 5%, 3ø AC
	230V± 5%, 1ø AC
Frequency	50 Hz ± 5%
Supply Volt	28 V DC

The power supply shall be configured to suit specific platform.

Total power consumed by Hydraulic circuit is 20 KW.

4. **Cabling**

The electrical connectors at the bottom of each cell are wired and connected to ship borne control system.

5. **Service Life**

(a) Total service life of VLU is at least 30 years.

(b) The service life of VLU with replacement of sub-assemblies is 10 years between major repairs. Items with lesser service life can be replaced in situ.

(c) The mechanisms of VLU ensure reliable operation without any need for regular local checks and servicing, adjustments and tuning while sailing (except scheduled servicing).

(d) The VLU is designed for continuous operation, without major maintenance routines falling due, for a minimum mission period of 30days, during which period, the equipment will be energized for an average of one hour a day.

(e) VLU provides for safe stowage the cylinder onboard for a minimum period of 24 months, without any reduction in the operational deployment of the cylinders.

(f) VLU along with cylinder can safely handle hang fire situation.

(g) Sensors and sprinklers can be fitted around the VLU inside the barbette.

6. **Safety Provisions**

(a) Provision for interlock has been made to exclude accidental operation of one system simultaneously with other system and to avoid unintended operation of system and mechanisms.

(b) Measures have been taken to ensure that ship's crew is not exposed to untoward danger during operation of VLU.

(c) In case of emergency situations on the ship, VLU will facilitate the possibility of carrying out emergency jettisoning of all cylinders. Emergency jettisoning of cylinders can be carried out by using normal scheme of control system operation .

7. **MTBF and MTTR**

VLU will ensure MTBF of 150 hours and MTTR for a single electric/electronic fault will be less than 15 minutes.

8. **Scope of work for VLU System**

A. Manufacture and supply of VLU system

Detail engineering/production drawing preparation, procurement, manufacture, In-process & final inspection as per BAPL approved QAP and Factory Acceptance Testing of the following:

a) Preparation of VLU & Hydraulic Control System (HCS) generic master QAPs duly for approval of DQA (N)

b) Main VLU Structure assembled with Vertical & Lateral shock absorption systems, Roller supports, Electrical Connector Mechanism & Limit switches for sensing cylinder presence.

c) Hydraulic control system for operation of hatches through local and remote console.

d) Static load testing of VLU frame structure, each cylinder place with strain gauging and submission of technical report for approval
   - 150 ton in vertical direction
   - 84 ton in lateral direction

e) Top Support Structure (TSS) assembled with hatch & hatch opening mechanism, locking mechanisms & limit switches for feedback on hatch open & close positions.

f) QC testing:
   - Static load test of TSS
   - Rain test of hatches
   - Vertical load test at centre of hatches

g) Composite Flexible Seal: This is used to prevent the ingress of plume and water into barbette space.

h) Hydraulic Power pack, Control valve desk & hydraulic control system for hatch operation.

i) Manufacturing and Load testing of Cylinder loading gear comprising of Vertical handling units, end ring & Universal handling beam assembly: This item is used for loading/unloading of cylinder in vertical configuration.

j) Cylinder, Dummy Caps & Canister Sleeves

k) Providing essential support to BAPL for undertaking Factory stage alignment measurements of VLU structure in assembled condition post static load testing of VLU.

l) Lifting slings for VLU and TSS

m) Manufacture, Assembly & Integration of HCS units

n) Preparation of Factory Acceptance Test plan for user.

o) Assembly, Integration & Functional Testing at Factory (FATs)

p) Preservation, Packing & Dispatch as per Def. Standard at Indian Navy designated store.

B. Supply of Technical Literature to BAPL

S. No.	Drawing / Document
1	Manufacturing drawings (AutoCAD format) and Bill of Materials
2	Detailed 3D and FE model with consolidated reports
3	User manual with Illustrated List of Spares (ISPL)
4	Maintenance Manual
5	Manufacturer recommended list of spares (MRLS)
6	Components Catalogue for bought out items
7	Draft Quality Assurance Plan (QAP) and Acceptance Test Plan (ATP) will be prepared by BAPL. Final QAP covering raw material checks, heat treatments checks, welding checks, surface treatment checks, painting checks, visual and dimensional checks, functionality checks, Load tests, Pre-deliver inspection
8	Test reports as per QAP (Raw material test reports, WPS/WPQ/PQR, stage wise inspection reports, DP reports, certificates of conformance, dimensional inspection reports, Paint reports, Torque application report, Acceptance test / Qualification test report)
9	CoC and data sheet to be submitted against make and model for all electrical items. CoC of FLP panels and Motors to be submitted.

Enclosure – II

VENDOR QUALIFICATION CRITERIA FROM TECHNICAL POINT OF VIEW FOR VLU

1. In-house expertise in 3D modelling, FE Analysis, generation of Auto-Cad drawings and associated sub-assemblies. The industry should have latest version of software and should share the CAD model/FE Model with assembly/manufacturing drawings with BAPL.
2. Vendor should share the details of sub-vendors on whom subsequent orders of component/assembly will be placed.
3. IPR for drawings/ model should rest solely with BAPL. The vendor should share the detailed production drawings, load testing scheme and other FE analysis report with BAPL.
4. Suitable production area of 15,000 m^2 approx. for component manufacturing and assembly for multiple VLU
5. Static load testing of VLU frame structure and Top Support Structure with max test load of 150tons. The industry should have separate load test facility for frame structure, Top Support Structure and cylinder loading gear.
6. Availability of load cell and display unit with proper calibration certificate for conducting static/dynamic load test
7. Suitable EOT crane/ Hydra and other load lifting equipment availability at vendor premises. Sufficient height under crane (25m approx.) should be available to lift cylinder and position it into individual structure.
8. Packing and delivery of equipment with Def. standard.
9. Vendors with past experience in manufacturing and implementing weapon complex for Naval platforms should be preferred.
10. Vendor should have following ISO certification, preferably:
    - ISO 3834: Certification for welding quality system.
    - ISO 9001: Quality management systems- requirements
    - ISO 14001: Environmental management systems
    - ISO 45001: Occupational health and safety management system.
    - ISO 27001: Information security management.
11. Vendors should follow NABL accredited labs verified reports as per QA plan.
12. Expertise and technical tie up with renowned organization for assembling and integrating the hydraulic, electronic systems with the geared systems for VLU.