

**EXPRESSION OF INTEREST FOR REPAIR, REFURBISHMENT AND LIFE  
EXTENSION OF X-31P MISSILES BY INDIAN INDUSTRIES THROUGH JV / MoU  
WITH OEM**

1. Indian Air Force under Ministry of Defence, invites Expression of Interest (Eoi) from Indian firms towards repairs, refurbishment, life extension checks and subsequent life cycle management of **X-31P** air launched missiles under the category of '**Missiles with Original Equipment Manufacturer (OEM) Support**', by Indian Firms through JV / MoU with OEM of the missile. Details of the proposal are appended in the following paragraphs.

2. **Schedule of Requirements.** Repair, Refurbishment and Life Extension of life expired X-31P Missiles held under various categories. Life extension covers all aspects of life assigned to the missile by OEM (eg. Shelf life, Service/ Operational life, life based on no. of landings, system energization cycles etc.). Life extension of the missiles are to be given after repair and refurbishment of the missiles. **Broad Scope of Works (SoW)** for Repair, Refurbishment and Life Extension task that is to be undertaken, is placed as **Annexure A**. However, detailed SoW is planned to be finalised in consultation with the Indian Industry undertaking the task along with the OEM.

3. **Mandatory Requirement.** Missiles which are to be repaired, refurbished and life extended under the said task are grouped under the category of '**Missiles with OEM Support**'. For which, the industry shall have **JVs / MoUs with the OEM** so as to get necessary technical support including required material from OEM on particular missile for establishing the capacity for undertaking refurbishment and life extension of missiles. **To ascertain the above condition, the Indian Partner shall attach a copy of JV/ MoU with OEM of X-31P missiles along with the proposal.**

4. **Technical Specifications and Methodology.** Repair, Refurbishment and Life Extension of life expired X-31P Missiles are to be undertaken as per the technology provided by the OEM. The technology provided by OEM is to be shared with IAF for necessary scrutiny on the Scope and extent of repair and refurbishment



being undertaken before finalising the detailed SoW. The final SoW in detail will be mutually finalised by IAF, OEM and Indian Partner.

5. **Quantities**. The project is envisaged to be undertaken in two phases, namely Phase-I (i.e Pilot Phase) and Phase-II (i.e. Series Production) as part of the same contract. Phase-II would be undertaken post successful completion of the Phase-I which includes evaluation by ground firing and live air firing. The quantities for phase I and II may be mutually finalised at the contract stage. **Non Obligatory Budgetary Quote (BQ) is to be attached with the proposal for total quantity of 10/20/40/60 missiles separately.**

6. **Certification and Quality Control**. Quality Assurance (QA) regulatory agencies will be involved in every step of the refurbishment and life extension process. **Clearances, facilitating inspections, liaison with regulatory agencies and subsequent certification will be entirely the responsibility of the Indian Industrial Partner undertaking the task.** Trials, Evaluation and Acceptance Test Procedure (ATP) for Phase-I and Acceptance Test Procedure (ATP) for Phase-II shall be formulated by the OEM and Indian Partner in consultation with IAF reps and QA regulatory agencies, as per OEM certification process envisaged in the original design documentation. The live Firing Trials, Evaluation and ATP will be finalised mutually.

7. **Documentation**. The Indian Partner is to undertake complete documentation of all refurbishment and replacement activities performed on each article. The Indian Industry undertaking the task is to make work packages and process sheets and mark the components with SI Nos. to ensure traceability. "Mandatory replacements" and "on-condition" changes to be carried out as per OEM technology. Detailed methodology for Refurbishment and Life extension of X-31P missiles and component level details of work that would be carried out on each component of the X-31P missile is to be clearly mentioned in the work sheets. Location where each activity and the facility required by the Indian Partner is to be clearly indicated by the Indian partner.

8. **Backward Compatibility**. The missiles delivered after repair, refurbishment and life extension should confirm to same Form, Fit and Function of the

available X-31P missiles with IAF. It should not alter the operational and maintenance philosophy of the missiles. The missiles repaired, refurbished and life extended under the said Contractual task should also have the following backward compatibility without any additional modification, up gradation or deterioration in performance and capabilities:-

- (a) Compatibility with the aircraft and mission computer with which it was earlier compatible with before repair, refurbishment and life extension.
- (b) Compatibility with the GURT / AKPA / OKA missile testers it was earlier compatible with before repair, refurbishment and life extension.
- (c) Interchangeability of Sections among missiles of similar type.
- (d) Compatible with MRLS supplied by OEM as part of any other X-31P procurement contracts in the past.

9. **Extended Life and Warranty.** The repaired and refurbished missiles should have a shelf life of minimum eight years from the date of completion of refurbishment. The repaired, refurbished and life extended missiles should be granted with a warranty of 24 months from the date of completion of refurbishment.

10. **Product Support.** The Indian Partner through JV / MoU with OEM who undertakes the repair, refurbishment and life extension is to provide product support for the entire life cycle of the repaired, refurbished and life extended missiles. The Indian Partner along with the OEM has to participate in Joint investigation of every failure associated with the delivered missiles in the spirit of Quality improvement of the process. The Indian Partner should also have an agreement to this effect with the OEM to cover the product support and joint investigation of failures. The Seller should study the reasons for failure of missile if any and institute remedial measures at their cost.

11. **Integration and Testing.** Integration and testing of the Phase-I missiles after passing the ground evaluation would be integrated on a suitable aircraft for necessary



evaluation and live firing at any of the IAF bases which would be decided on a later stage.

12. **Delivery Period.** The Phase-I of sample refurbishment and trials should preferably be completed within 18 months from date of signing contract and series production should start within 24 months from the date of signing the contract.

13. **Date of Submission of EoI.** Interested firms are to submit their Expression of Interest in the form of a **compliance matrix** along with the format placed as **Annexure B** along with necessary supporting documents before **21 days** from publishing of this request for EoI.

14. **Contact Details of Sponsoring Agency.**

Air Cmde ASE  
Dte of ASE  
Air HQ (Anthodya Bhavan)  
B-II Wing, 13th Floor,  
CGO Complex,  
Lodi Road, New Delhi -110003  
Tele: 011-24362036  
Email: pdase@iaf.nic.in



(सी. आर. एस. राजू) / (VRS Raju)  
एयर कमान्डर / Air Cmde  
एयर कमान्डर ए.एस.ई.  
Air Cmde ASE  
एयर हेड, एंथोदिया (अन्थोदिया भवन) / Air HQ (AB)  
नई दिल्ली / New Delhi-110003

**Annexure A**

(Refers to para 1 of  
EoI for Repair, Refurbishment  
and Life Extension of X-31P msls)

**BROAD SCOPE OF WORKS FOR REPAIR, REFURBISHMENT  
AND LIFE EXTENSION OF X-31P MISSILES**

1. The activities to be performed are tabulated below: -

SI No.	Place of Execution	Activity
(a)	Air Force Station Amla	<p><b><u>Acceptance: Visual Inspection</u></b></p> <p>(i) Unpacking and Depreservation (ii) Scrutiny of log books. (iii) Analysis of previous test results. (iv) Survey of storage conditions. (v) Physical inspection of storage conditions, visual inspection, checking for major damages, deterioration /corrosion /scratches, dents etc. if any.</p>
(b)	Air Force Station Amla	<p><b><u>Acceptance: Testing and Inspection</u></b></p> <p>(i) Clearance for testing. (ii) Joint testing of each missile by IAF team and the Indian Partner team on 'I level tester' (OKA-E / AKPA / GURT) as per procedure mentioned in X-31P testing manual. (iii) Documentation of the test results in the missile log books as well as the receipt documents of the Indian Partner of OEM, ascertain the unserviceability if any and endorse in the log book.</p>
(c)	Air Force Station Amla	<p><b><u>Acceptance: Packing and Transportation</u></b></p> <p>(i) Preservation. (ii) Packing, handing/ taking over of each missile and related documentation. (iii) Transportation to seller's location for refurbishment.</p>

(d)	At Sellers premise for refurbishment	<p><b><u>Disassembly</u></b></p> <p>(i) Complete disassembly of each missile up to section level and sub section level as per OEM Technology / detailed SoW finalised.</p> <p>(ii) Checking each components of the electronic sections including Homing Head, separately on 'Section level specialist tester' and carrying out repairs if required as per OEM Technology / detailed SoW finalised and inspection parameters provided by the designer.</p> <p>(iii) Reassembly of electronic sections after repair / refurbishment.</p> <p>(iv) QC checks of electronic sections post repair / refurbishment.</p> <p>(v) Testing of electronic sections post repair / refurbishment using 'Section level specialist tester' before clearance for missile assembly.</p>
(e)	At Sellers premise for refurbishment	<p><b><u>Mandatory Replacements (Energetics)</u></b></p> <p>(i) Boosters Engine solid propellents (with ignitor and entire section)</p> <p>(ii) Thermal Batteries</p> <p>(iii) Gas generators</p> <p>(iv) Squibs</p> <p>(v) Pyros</p> <p>(vi) Rubberised components/ Seals</p> <p>(vii) SAM (pyros)</p>
(f)	At Sellers premise for refurbishment	<p><b><u>Overhaul</u></b></p> <p>(i) Cruise Engines (replace liquid fuel)</p> <p>(ii) Engine Fuel System</p> <p>(iii) Flight Control Systems and actuators</p>
(f)	At Sellers premise for refurbishment	<p><b><u>Checking for "On Condition" Components</u></b></p> <p>(i) Checking &amp; replacement of electrical looms and harnesses</p> <p>(ii) Plug connectors</p> <p>(iii) Composite covers and fairings</p> <p>(iv) Control surfaces</p> <p>(vi) Pins and plungers for signs of corrosion</p> <p>(vii) Lugs and attachment points (Radiography and crack detection tests to be carried out on all attachment points)</p>

(g)	At Sellers premise for refurbishment	<p><b><u>Anti-Corrosion Checks and Treatment</u></b></p> <p>(i) All Mechanical &amp; Structural Parts including attachment points.</p> <p>(ii) Pins and Plungers to be subjected to careful examination and anti-corrosion treatment.</p> <p>(iii) Special emphasis to be given to the lift off pin. serviceability of the lift off pin is very important.</p>
(h)	Air Force Station Amla	<p><b><u>Assembly</u></b></p> <p>(i) Assembly of Sections</p> <p>(ii) Checking for completeness of items on missiles</p> <p>(iii) Testing of each missile on 'I level tester' (OKA-E / AKPA / GURT)</p> <p>(iv) Ensuring Serviceability on 'I level tester' (OKA-E / AKPA / GURT) &amp; annotation to that effect</p> <p>(v) Preservation and packing.</p>
(j)	At any location as decided later where such firing / test facilities are available	<p><b><u>Testing and Validation</u></b></p> <p>(i) Certain number of missiles as per QTP would undergo static firing tests as a first requirement.</p> <p>(ii) Certain number of missiles as per QTP would be fired from ground from suitably modified Ground Launchers for validating the safety.</p> <p>(iii) Live launching of missiles as per QTP from aircraft for air validation.</p>



**Annexure B**

(Refers to para 1 of  
Eol for Repair, Refurbishment  
and Life Extension of X-31P msls)

**FORMAT FOR EXPRESSION OF INTERST FOR REPAIR, REFURBISHMENT  
AND LIFE EXTENSION OF X-31P MISSILES THROUGH JV / MoU WITH OEM**

1. The following format of time lines is to be filled in response to the Eol: -

SI No.	Activity	Compliance/ Time line by which the activity would be completed
(a)	Availability of JV/ MoU with the OEM for repair, Refurbishment and Life extension of X-31P missiles	..... (also specify the OEM which JV/MoU is planned)  In case JV / MoU already available, please attach Copy of same
(b)	Acquiring Refurbishment and Life extension Technology from OEM	
(c)	Formulation of Complete methodology and detailed refurbishment plan including the SoW and documentation of the same in hard and soft copies	
(d)	Authentication by Regulatory agencies	
(e)	Finalisation of the detailed SoW in consultation with IAF	
(f)	Setting up of Section level Testers for Electronic Sections in India	
(g)	Setting up of Refurbishment Line in India	
(h)	Readiness of Propellants and other mandatory replacements for Phase-I of missiles	
(i)	Delivery of Phase-I of Repaired, Refurbished and Life Extended missiles along with requisite documentation	
(j)	Readiness of Propellants and other mandatory replacements for Phase-II	
(k)	Refurbishment capability per month	
(l)	Timeline for completion of Phase-II	

P.T.O





2. **Non Obligatory Budgetary Quote for undertaking the project: -**

- (a) For 10 Missiles : Rs.....
- (b) For 20 Missiles : Rs .....
- (c) For 30 Missiles : Rs.....
- (d) For 40 Missiles : Rs.....
- (e) For 50 Missiles : Rs.....



(**Dr. P. K. Singh**) / (Dr. P. K. Singh)

Dr. P. K. Singh / Dr. P. K. Singh

Dr. P. K. Singh / Dr. P. K. Singh

Dr. P. K. Singh / Dr. P. K. Singh

Dr. P. K. Singh / Dr. P. K. Singh (As)

Dr. P. K. Singh / Dr. P. K. Singh