



## SPECIFICATIONS FOR THE ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT

### SECTION I INVITATION PROCUREMENT PROCESS THROUGH PUBLIC TENDER

#### PE-ASTEP-2025-065

Ecuadorian Naval Shipyards -ASTINAVE EP, by virtue of Administrative Resolution No. RE-ASTINAVE EP-GGE-DJU-046-2024, of December 2, 2024, which amends the Regulations for Contracting by Specific Line of Business of Ecuadorian Naval Shipyards - ASTINAVE EP, related to Contracting by Public Tender, and resolution of initiation of the process No. **GLO-CTR-059-2025**, international companies interested in participating in the "**ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT**" are invited to present their technical and financial proposal in this process.

The conditions of the contest are:

- Purpose of the process:** The purpose of this tender is the **ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT**.
- Reference budget:** ASTINAVE EP has funds available to fulfill the purpose of the contract, having previously certified the funds in Budget Items No. 631006-11-110316, called INDUSTRIAL-PROJECTS, for an amount of **\$ 3.990.971,19 (THREE MILLION NIGTHY-ONE THOUSAND SIX HUNDRED SIXTEEN AND 64/100 DOLLARS OF THE UNITED STATES OF AMERICA)**.
- Schedule of the procedure:** The schedule that will govern the procedure will be as follows:

Ecuador Time GMT-5

Concepto	Día	Hora
Date to make the announcement	May 12, 2025	15:00
Date and time limit for receiving questions	May 15, del 2025	16:00
Date and time limit for clarifications and answers	May 19, 2025	16:00
Date and time limit for proposal delivery	May 29, 2025	15:00
Date of opening of the proposal	May 29, 2025	16:00
Estimated award date	June 3, 2025	16:00

In accordance with the provisions of resolution **RE-ASTINAVE EP-GGE-DJU-046-2024** in which the **Contracting Regulations by Specific Line of Business of ASTINAVE EP** are issued, it indicates in "Art. 60.- Validation of errors. - Action shall be taken in accordance with the provisions of Article 45 of these Regulations. Once the bids have been analyzed, if formal errors are presented, they may be validated by the bidders, at the request of the Technical Commission of -ASTINAVE EP-, within a period of 2 to 5 days, counted from the date of notification.





This term shall be set at the discretion of the Technical Commission in relation to the procurement procedure and the level of complexity and magnitude of the procurement required. The request for validation of errors shall be notified to all bidders through physical or electronic means, and for this purpose the Certificate of Validation of Errors shall be prepared." In view of the above, the Technical Commission, in relation to the procurement procedure and the level of complexity and magnitude of the procurement required, will determine whether it is necessary to carry out validations and will notify suppliers of the schedule for receiving the validation.

4. **Questions, answers and clarifications:** Invited bidders may ask the questions they deem necessary, or if they need clarification on a part of the documents, they will ask ASTINAVE EP, at the email address of the president of the technical commission [jureyes@astinave.com.ec](mailto:jureyes@astinave.com.ec); [dmurillo@astinave.com.ec](mailto:dmurillo@astinave.com.ec); [lbahamonde@astinave.com.ec](mailto:lbahamonde@astinave.com.ec); y [vcardenas@astinave.com.ec](mailto:vcardenas@astinave.com.ec), the answer to their concern or query. ASTINAVE EP will answer questions or make any necessary clarifications to the invited recipient's email address.
5. **Changes to the schedule:** ASTINAVE EP may modify the schedule until the deadline set to make the clarifications and responses; The change will be notified by email to the invited suppliers.
6. **Convalidación de errores:** De acuerdo con lo establecido en la resolución RE-ASTINAVE EP-GGE-DJU-046-2024 en la cual se expide el Reglamento Contrataciones por Giro Especifico de negocio de ASTINAVE EP, indica en el "Art. 60.- *Convalidación de errores. - Se actuará conforme lo prescrito en el artículo 45 de este Reglamento. Analizadas las ofertas, si se presentaren errores de forma, podrán ser convalidados por los oferentes, a pedido de la Comisión Técnica de -ASTINAVE EP-, dentro del término de 2 a 5 días, contados a partir de la fecha de notificación. Dicho término se fijará a criterio de la Comisión Técnica con relación al procedimiento de contratación y al nivel de complejidad y magnitud de la contratación requerida. El pedido de convalidación de errores será notificado a todos los oferentes a través de medios físicos o electrónicos y para el efecto se elaborará el Acta de convalidación de errores.*".
7. **Validity of the offer:** The offer will be understood to be valid for up to 60 days or until the conclusion of the contract.
8. **Bid price:** The price of the proposal will be understood as the value that the bidder states in its technical and economic offer. The bid price must cover all the activities and costs necessary for the bidder to comply with the purpose of this process, to the full satisfaction of ASTINAVE EP. The price is fixed and unchanging. There will be no price adjustments, and they are the sole responsibility of the bidder. It is understood that any omission is voluntary and intended to obtain prior ones that allow it to present a more advantageous offer.  
  
The tender must be submitted in United States dollars. Payment will be made in the same currency.  
The price that ASTINAVE EP will pay to the successful bidder is without bank discounts or transfer fees.
9. The price of the goods is in terms of INCOTERMS 2020 - CIF-Port of Guayaquil. The economic offer shall break down the unit price of each item, the value of the merchandise, and other expenses according to what is required in the technical specifications.
10. **Execution period:** The delivery time for the goods is 365 calendar days from the day following written notification by the contract administrator of the availability of the advance payment, to







the bank account provided by the contractor. Partial deliveries will exist as shown in Table 7.1  
Method of Delivery of Goods.

Item	Term (calendar)	Description	QUANTITY	Unit
1st delivery	260 calendar days counted from the day following written notification by the contract administrator	Tail shaft - length: 11352,5 mm with 04 bronze sleeve epoxy resin protection.	4	unit
		Bearing with temp control - Similar to FAG TUZ940K150389 - Shaft Diam 191 mm.	8	unit
		Water lubricated sealing - shaft sleeve diameter: 190,5 mm.	4	unit
		Hydraulic coupling - Shaft diam 190 mm/high strength steel.	6	unit
		Pump Hydraulic Coupling.	2	unit
		Hydraulic Caliper.	4	unit
		Flanged bronze bushing/ bushing elastomer bi-parted o similar.	16	unit
		Propeller - 4 Blades, Diam: 1400 mm	4	unit
2nd delivery	365 calendar days counted from the day following written notification by the contract administrator	Tail shaft - length: 11352,5 mm with 04 bronze sleeve epoxy resin protection.	8	unit
		Bearing with temp control - Similar to FAG TUZ940K150389 - Shaft Diam 191 mm.	16	unit
		Water lubricated sealing - shaft sleeve diameter: 190,5 mm.	8	unit
		Hydraulic coupling - Shaft diam 190 mm/high strength steel.	12	unit
		Pump Hydraulic Coupling.	4	unit
		Hydraulic Caliper.	8	unit
		Flanged bronze bushing/ bushing elastomer bi-parted o similar.	32	unit
		Propeller - 4 Blades, Diam: 1400 mm	8	unit

Table ¡Error! No hay texto con el estilo especificado en el documento..1.- Partial Delivery plan of goods.

**11. Conditions for importation:** For customs clearance, the supplier is obliged to send the import draft documents (invoice, packing list and other documents) by email, at least 15 days before shipment.

The supplier is obliged to deliver the original physical documentation so that ASTINAVE EP can carry out customs clearance without delay. Therefore, it will deliver said original documentation at least 5 DAYS prior to the arrival of the cargo in Port of Guayaquil.

ASTINAVE EP will be the only one in charge of authorizing the shipment to THE SUPPLIER. If there is no authorization for shipment and the material is still shipped, it could be re-sent to origin for not complying with the requirements of Ecuadorian customs and THE SUPPLIER will be responsible for assuming these expenses.

No merchandise in addition to what is mentioned in the Packing List of each package will be sent, unless the additional is notified to ASTINAVE EP and it in turn approves its shipment.

Any delay caused by the non-delivery of documentation for customs purposes will be the sole responsibility of the supplier.

**12. Payment method:** The following payment method and conditions are established:  
ASTINAVE EP, will pay the contract for the " **ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT** ", as follows:





**ADVANCE: 50%** of the advance, for which the awarded supplier will provide a **GUARANTEE** of good use of the advance. Due to the nature of the contracting process, it must also provide the guarantee of faithful performance of the contract prior to the signing of the contract.

**FIRST PAYMENT: 30%** against **PARTIAL** delivery of the goods from the first delivery. This will be cancelled with the prior authorization of the contract administrator, *once the goods have been delivered through the CIF Puerto de Guayaquil modality*. The enabling documents for payment are:

- a. Commercial invoice.
- b. BL or shipping document
- c. International insurance
- d. Notification of cargo arrival at the port of Guayaquil and.
- e. Necessary documentation detailed in **ITEM 6.1.1** Tail shaft.
- f. Type approval certificate for naval use of the seal elements, hydraulic joints, elastomeric cylinder.
- g. Certificate of manufacture and origin and ISO certificate of the bearing, hydraulic caliper, hydraulic pump.
- h. Necessary documentation detailed in **ITEM 6.1.7** Flanged bronze bushing //bushing elastomer biparted o similar.
- i. Documentation required in **ITEM 6.1.8** Propeller.
- j. Technical guarantee.
- k. Partial receipt delivery certificate.

**SECOND PAYMENT: 20%** upon **TOTAL** delivery of the goods. This will be cancelled with the prior authorization of the contract administrator, *once the goods have been delivered through the CIF Puerto de Guayaquil modality*, The enabling documents for payment are:

- a. Commercial invoice.
- b. BL or shipping document
- c. International insurance
- d. Notification of cargo arrival at the port of Guayaquil and.
- e. Administrator's acceptance report of the partial contract
- f. Necessary documentation detailed in **ITEM 6.1.1** Tail shaft.
- g. Type approval certificate for naval use of the seal elements, hydraulic joints, elastomeric cylinder.
- h. Certificate of manufacture and origin and ISO certificate of the bearing, hydraulic caliper, hydraulic pump.
- i. Documentation required in the **ITEM 6.1.7** Flanged bronze bushing/bushing elastomer biparted o similar.
- j. Documentation required in **ITEM 6.1.8** Propeller.
- k. Technical guarantee.
- l. Partial receipt delivery certificate

Note: The bid price must cover all activities and costs necessary for the bidder to comply with the purpose of this process, to the full satisfaction of ASTINAVE EP. The price is fixed and unchanging. There will be no price adjustments and they are the sole responsibility of the offeror, and in accordance with Art. 75.- "... In order to receive the advance, it must first provide guarantees for the same value of the advance, which will be reduced in the proportion that the advance is amortized or the works, goods or services are provisionally received...", the amortization of the advance paid by ASTINAVE EP will proceed in the subsequent





**13. How to submit the bid:** The bid must be sent to the email address of the president of the technical commission [jureyes@astinave.com.ec](mailto:jureyes@astinave.com.ec); [dmurillo@astinave.com.ec](mailto:dmurillo@astinave.com.ec); [lbahamonde@astinave.com.ec](mailto:lbahamonde@astinave.com.ec); y [vcardenas@astinave.com.ec](mailto:vcardenas@astinave.com.ec), until the date and time described in the process schedule.

The bidder must attach the following documents to its bid:

- Copy of the passport or identity card of the legal representative or their proxy.
- Document that proves the existence and validity of the company (statutes or deed of incorporation or registration with the competent entity of the country of origin, etc.).

No account will be taken of the offer sent after the day and time set for its delivery reception.

**14. Single Bid Form:** The bid will be made up of the following forms:

1. General Data of the Bidder;
2. Bank information for transfer;
3. Table of quantities and prices;
4. Component of the goods and services offered;
5. Bidder's Experience;
6. Letter of Confidentiality;
7. Technical Guarantee Form;
8. Letter of Declaration and Responsibility;

**15. Evaluation of the offer (complies/does not comply):** The qualification parameters proposed below are the minimum conditions that the offer must meet. The parameters will be evaluated using the "meets or does not meet" methodology. If the offer meets all the requirements, it will be valued according to its price.

For this process, the parameters to be evaluated correspond to those detailed in the following table:

**TABLE OF VERIFICATION OF TECHNICAL AND ECONOMIC OFFER COMPLIANCE.**

Rating Parameter	Compliant	Not compliant
Bid Integrity (Forms)		
Overall Experience		
Specific Experience		
Technical Specifications		
Reference Budget		
Other Minimum Requirements		

In the second phase, only bidders who have previously accredited a minimum required condition or capacity will move on to the "By Score" stage, whose methodology will





serve to establish or define the proposal that offers the best technical and economic conditions or capabilities among the qualified bidders.

Rating Parameter	Rating (points)
Economic Offer	20
Overall Experience	20
Specific Experience	20
Delivery Time	20
Added Value / Additional Enhancements	20
<b>Total:</b>	<b>100</b>

**Note:** Refer to the Technical Report of Need numeral 8.3 Scoring parameter by score

#### 16. Advance Payment Guarantee:

*"Art. 75.-Advance Payment Guarantee. -If, due to the form of payment established in the contract, the Contracting Entity should grant advances of any nature, whether in cash, sight drafts or another form of payment, the contractor, in order to receive the advance payment, must previously render guarantees of equal value of the advance, which will be reduced in the proportion that it is amortized or in the proportion that works, goods or services are received. Letters of credit will not be considered an advance payment if their payment is conditional on the delivery-receipt of the goods or works that are the subject of the contract. The amount of the advance payment will be regulated by the Contracting Entity in consideration of the nature of the contract."*

Contractors may render any of the guarantees established in Article 73, Law of the National System of Public Procurement.

#### 17. Faithful Performance Guarantee:

*"Art. 74.- Faithful Performance Guarantee. - For security of contract compliance and to respond for the obligations incurred in favor of third parties, related to the contract, the successful bidder, before or at the time of signing the contract, will render guarantees for an amount equivalent to five (5%) percent of its value. In the contracts of works, as well as in integral contracts for a fixed price, this guarantee will be constituted to guarantee compliance with the contract and the obligations contracted in favor of third parties and to ensure the proper execution of the work and the good quality of the materials, thus ensuring the repairs or changes of those parts of the work in which construction present defects, poor quality or non-compliance with specifications, attributable to the bidder, are discovered. In works contracts or in the contracting of non-standardized services, if the financial offer awarded is less than the referential budget by a percentage equal to or greater than ten (10%) percent of it, the guarantee of faithful performance must be increased by one amount equivalent to twenty (20%) percent of the difference between the referential budget and the amount of the contract."*

Contractors may render any of the guarantees established in Article 73, Law of the National System of Public Procurement.

#### 18. Technical Guarantee:

The awarded bidder, in compliance with the requirements and other general and specific conditions for the **"TECHNICAL REPORT REQUIREMENT FOR THE ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT"**, will ensure



that all the goods requested comply with the specifications, chemical composition of the requested material and IACS certification, as appropriate in what is described in the Technical Specifications.

The technical warranty period will be 12 months for the components of the first delivery and 18 calendar months for the components of the second delivery, counted from the date of signature of the delivery, partial and/or total acceptance certificate. The technical warranty will confirm that the goods are brand new from the factory, of optimal quality, free of defects and manufacturing flaws, and that they comply with the technical specifications, manufacturing standards, and requirements demanded by ASTINAVE EP.

During the term of validity of the Technical Warranty, if ASTINAVE EP requests the replacement of parts, or parts of the contracted good that have been considered defective, these will be replaced by new ones of the same quality and condition, at no additional cost to ASTINAVE EP within a maximum period of 90 days, counted from its notification.

**19. Cancellation and Declaration of Void Proceeding:** ASTINAVE EP reserves the right to cancel or declare void the contracting procedure, in which case there will be no payment of any compensation.

**20. Award and Notification:** Based on the evaluation report of the bid submitted, the General Manager will award the procurement procedure.

The award must be total, in accordance with institutional interests.

The notification of the award will be made by email.

**21. Contract Administration:** ASTINAVE EP will appoint a contract administrator, who will ensure the full and timely fulfillment of each and every one of the obligations derived from it. The administrator will be authorized to carry out the procedures inherent to its execution, including that which is related to the acceptance or not of the extension requests that the contractor may make.

**22. Fines:** For each day of delay in the delivery of the goods and/or failure to comply with contractual obligations, ASTINAVE EP will impose a fine equivalent to 1x1000, which will be calculated on the percentage of the obligations that are pending execution in accordance with the provisions of article 71 of the LOSNCP, in accordance with articles 292 and 293 of the General Regulations to the Organic Law of the National Public Procurement System, currently in force. Any fines incurred will be deducted from outstanding payments.

**23. Procurement procedure:** This procurement procedure shall be submitted under the provisions of the Organic Law of the National Public Procurement System, its General Regulations of application, and the provisions of CHAPTER IV: CONTRACTING BY PUBLIC TENDER of the Regulations on Contracting by Specific Line of Business of Ecuadorian Naval Shipyards - ASTINAVE EP.





Given and signed in the city of Guayaquil, on the 12th day of the month of May 2025.

Ing. Katherine Villacrés Paredes  
**Delegate of the Highest Authority**  
**ECUADORIAN NAVAL SHIPYARDS -ASTINAVE EP-**

Acción	Name	Responsibility	Signatures of responsible
Elaborate	Ing. Joselin Piguave Arteaga	Ejecutivo de Contrataciones	





## SECTION II TECHNICAL SPECIFICATIONS AND TERMS OF REFERENCE

### DETAIL OF TECHNICAL SPECIFICATIONS OF THE GOOD TO BE CONTRACTED

#### DETAIL OF THE TECHNICAL SPECIFICATIONS

The following technical specifications are established:

No.	CPC	Goods	Quantity	Unit	Technical Specification Detail: Characteristics, Functional or Technological Requirements.
1	435701115	Tail shaft - length: 11352,5 mm with 04 bronze sleeve epoxy resin protection.	12	UND	Detailed section in aspect 6.1.1 Tail shaft
2	432530018	Bearing with temp control - Similar to FAG TUZ940K150389 - Shaft Diam 191 mm.	24	UNID	Detailed section in aspect 6.1.2 Bearing
3	4127809116	Water lubricated sealing - shaft sleeve diameter: 190,5 mm.	12	UNID	Detailed section in aspect 6.1.3 Water lubricated sealing
4	4127809116	Hydraulic coupling - Shaft diam 190 mm/high strength steel.	18	UNID	Section detailed in aspect 6.1.4 Hydraulic coupling.
5	4315100115	Pump Hydraulic Coupling.	6	UNID	Section detailed in aspect 6.1.5 Pump hydraulic coupling.
6	435701117	Hydraulic Caliper.	12	UNID	Detailed section in aspect 6.1.6 Hydraulic Caliper.
7	432530018	Flanged bronze bushing/ bushing elastomer bi-parted o similar.	48	UNID	Detailed section in aspect 6.1.7 Flanged bronze bushing/ bushing elastomer bi-parted o similar.
8	429980011	Propeller - 4 Blades, Diam: 1400 mm	12	UNID	Sección detallada en el aspecto 6.1.8 Hélice.

**Table 2.- Technical specifications of the propulsion components.**

#### TAIL SHAFT

Tail shaft with 04 bronze sleeve, with shaft key and protection with epoxy resin between sleeves which must be machined as detailed in the attached plan (See Annex A), which are technical specifications provided by the original manuals and plans of the Italian Fincantieri Navali, Shipyard Constructor of the corvettes.

The technical specifications of each of the tail shaft components are detailed below:

### Shaft and shaft key characteristics

Dimensions, chemical composition and mechanical properties of the shaft and shaft key are detailed below. Additionally, the certification of the material, origin and results of the tests carried out on the specimens that the factory elaborated is required.

#### Dimensions:

**Length mm:** see drawing Annex "A"

**Outside diameter mm:** see drawing Annex "A"

#### Chemical Composition:

The percentage of the alloy of forged steel nickel – molybdenum Class 1 or similar should be in the following range:

CHEMICAL COMPOSITION OF NICKEL STEEL - MOLYBDENUM											
C	Mn		P	S	Si	Ni		Cr	Mo		V
Máx	Mín	Máx	Máx	Máx	Máx	Mín	Máx	Máx	Mín	Máx	Máx
0,28	0,15	0,45	0,020	0,015	0,35	2,75	3,50	0,50	0,25	0,60	0,08

**Table 3.- Chemical composition of the shaft and shaft key.**

#### Mechanical Properties:

It must meet the MIL-S-23284 A or similar standard required for this type of steel.

MECHANICAL CHARACTERISTICS OF NICKEL STEEL - MOLYBDENUM			
Tensile strength (Lb/in <sup>2</sup> )	Yield strength (Lb/in <sup>2</sup> )	Elongation (%)	Hardness Brinell (HB)
95000/115000	75000	20	190

**Table 4.- Mechanical properties of the shaft and shaft key.**

### Characteristic bronze sleeve

Dimensions, chemical composition and mechanical properties of the sleeve are detailed below. Additionally, the certification of the material, origin and the results of the tests carried out on the specimens that the factory elaborated is required.

#### a. Dimensions:

The location, dimensions, installation adjustment and surface finish of the bronze sleeve installed on the tail shaft are detailed in the attached drawing annex "A".

**DIMENSION OF REQUIRED SLEEVE PER TAIL SHAFT**

Qty	Sleeve Location	Outside Diam. (mm)	Inside Diameter (mm)	Length (mm)
1	Stuffing box	190,5	See adjustment in annex drawing "A"	950
1	Stern	190,5	See adjustment in annex drawing "A"	500
1	Strut 1	190,5	See adjustment in annex drawing "A"	500
1	Strut 2	190,5	See adjustment in annex drawing "A"	800

**Table 5.- Dimension and location of tail shaft sleeve.**

**b. Chemical Composition:**

The chemical composition must be a copper alloy and must be in the following composition range or higher than that of the elements that make it up:

**CHEMICAL COMPOSITION OF THE BRONZE SLEEVE**

Cu		Sn		Pb	Zn		Ni
Min	Max	Min	Max	Max	Min	Max	Max
78,00	89,00	9,00	11,00	0,30	1,00	3,00	1,00

**Table 6.- Chemical composition of tail shaft sleeve.**

**c. Mechanical Properties:**

The mechanical properties of bronze sleeve must at least meet the standard required for this type of alloy:

**MECHANICAL CHARACTERISTICS OF THE BRONZE SLEEVE**

Tensile Strength Mpa (Ksi)	Yield strength Mpa (Ksi)	Elongation (%)	Hardness (HB)
276 (40.03)	124 (17.98)	20	80

**Table 7.- Mechanical properties of tail shaft liners.**

**Metallic Epoxy Protection on the Shafts**

The tailshafts must include metallic epoxy protection or an equivalent product that complies with environmental protection standards in the sections indicated in the original plan (sectors A – B – C – D) (see Annex A) and tailshaft treatment diagram. The minimum thickness of the tailshaft coating will be 2 mm in radius.

Material certification is required, 12-month technical warranty.

**Documentation to be delivered prior to receipt of the partial/total delivery certificate**

The results of the tests carried out on the specimens made by factory elaborated are required, as indicated in annex "B" of the MIL-S-23284 A (SHIPS) standard, the required reports are:





- Chemical analysis
- Mechanical test result.
- Grain size.
- Microscopic test result.
- Nonmetallic inclusion test result.
- Dimensional test results.
- Visual test results.
- Ultrasonic test results.
- Magnetic particle results.



#### Metallic Epoxy Coating

- Material application procedure.
- Certification of installed metallic epoxy material.
- 12-month technical warranty on the applied coating.

Additionally, the following tests must be performed:

- Pneumatic pressure tests on bronze sleeves.
- Verification of the settlement between the propeller cone and the shaft cone greater than 80%.
- Verification of the sleeve settlement due to interference.

**Note:** Detailed plan of the tail shaft will be delivered once the process has been awarded.

#### BEARING/PILLOW BLOCK

Bearing/Pillow Block with bearing housing, cylindrical tapered roller bearings and liner for shaft to 191 mm diameter, similar to FAG TUZ940K150389, as indicated in Annex "C". The dimensions, material and characteristics of each of the components are detailed below:

##### Bearing housings

The features are detailed in the detailed table below:

<b>Dimensions</b>	According to drawing Annex "C" "SOPORTO FAG PER LINEA D' ASSI"
<b>Material</b>	Cast Steel
<b>Instrumentation</b>	Continuous temperature control.
<b>Lubrication</b>	Not forced
<b>Work temperature</b>	Lubrication up to 100 °C.

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##### Cylindrical roller tapered bearing.

The features are detailed in the detailed table below:

<b>Dynamic capacity</b>	310 Kn
<b>Static Capacity</b>	310 Kn



<b>Weight</b>	9 Kg
<b>Inside diameter</b>	200 mm
<b>Conical hole</b>	taper 1:12
<b>Outside diameter</b>	280 mm
<b>Height</b>	56 mm
<b>Radial clearance</b>	C3
<b>Cage material</b>	Bronze

**Table 9.- Technical specifications of cylindrical roller tapered bearing.**

### Linner

The features are detailed in the table below:

<b>Shaft diameter</b>	191.0 mm
<b>Outer diameter for bearing race</b>	200.0 mm
<b>Taper</b>	1:12
<b>Height</b>	98.0 mm
Should include bushing, nut y washer	

**Table 10.- Technical specifications of linner**

### Documentation to be delivered prior to receipt of the partial/total delivery certificate

Manufacturing Certification  
ISO Certificate

### SHAFT MECHANICAL SEAL

The mechanical seals will be located on the bronze sleeve of the tail shaft having a diameter of 190.5 mm, with the following characteristics detailed below:

- Water-cooled seal for propulsion lines which must have an inflatable emergency seal.
- The seal design shall be appropriate for the tail shaft to work at 850 RPM.
- Solid base construction in NAB nickel, bronze and aluminum alloy.
- The compression bellows must withstand large axial movements without changing the pressure in the shape of the seal.
- The contact area of the seal must allow the absorption of possible axial and radial misalignments.
- Seal rings must be made of silicon carbide or similar, wear-free and suitable for shafts with a diameter of 190.5 mm.
- They will be lubricated with water in the elbow tube, and will be maintenance-free.
- Seal length should not be more than 246 mm.
- Permissible misalignment 2 – 4 mm

### Documentation to be delivered prior to receipt of the partial/total delivery certificate

Type Approval certification, for naval use

### HYDRAULIC COUPLING

The joints make it possible to connect 02 shaft of the propulsion system. They must have a hydraulic actuation mechanism, based on the principle of holding down an outer conical sleeve on an inner conical sleeve in order to generate a radial force and at the same time increase the frictional force that will be able to maintain the union between the shafts and

Type	Mechanical connection of two propulsion shafts (shaft – shaft)
Shaft Diameter	190 mm
Material	High-strength steel
Mounting/disassembling system	Hydraulic
Motion Transmission	Oil-free
Coefficient of friction	minimum 0.3
Torque	220 KNm
Inner diameter	190 mm
Outer diameter	Until 286 mm
Maximum Length	Until 530 mm
Maximum weight	140 kg
Polar Moment of Inertia	Until 2.04 Kgm <sup>2</sup>

**Table 11.- Technical specifications of hydraulic coupling.**

#### Documentation to be delivered prior to receipt of the partial/total delivery certificate

Type approval Certification for naval use  
Manufacturing certification

#### HYDRAULIC PUMPS

The hydraulic pumps will allow the coupling/decoupling of the hydraulic joints described in **ITEM 6.1.4**, which will be manually operated and will include the accessories and connectors to work with the joint.

**Documentation to be delivered prior to receipt of the partial/total delivery certificate**  
Manufacturing and Origin certification.

#### HYDRAULIC CALIPER

The hydraulic caliper must provide the propulsion lines with a deceleration without the forces of the main engines until their final stop is achieved, in order to prevent their movement due to the inertia that is created by the flow of water.

The caliper must work as a drum on the flange of the countershaft, this element will be installed on a base that is already mounted on the boat as detailed in the attached plan see Annex "D". Below is the data of the characteristics of the brake:

TECHNICAL DATA OF HYDRAULIC CALIPER	
Braking force max.:	28 Kn
Brake pressure:	100 bar
Braking torque:	5000 Nm
Max. oil volume.:	78 cm <sup>3</sup>
Dimensions	According to the plan attached in Annex "D"

**Table 12.- Technical specifications of the hydraulic caliper.**

The hydraulic caliper must include its hydraulic actuator.



The specific physical characteristics and dimensions can be found in Annex "D" to this report.

The supplier will ensure that the brakes are mounted on the structures (bases) that are already inside the vessel, or failing that, the elements that allow their correct installation and operation.

**Documentation to be delivered prior to receipt of the partial/total delivery certificate**  
Manufacturing Certification  
ISO Certificate

#### FLANGED BRONZE BUSHING/BUSHING ELASTOMER BIPARTED O SIMILAR

Flanged bronze bushing with bipartite elastomeric bushing or similar with easy to disassemble clamping method with the shaft installed on site. The Flanged bronze bushing/bushing elastomeric biparted or similar shall be designed to withstand the loads exerted by the tail shaft.

These bushing will be located on stuffing box, Stern and struts which must comply with the technical specifications, dimensions, physical and mechanical properties detailed below:

#### Technical Specifications

The bronze bushing should be flanged and have at least the technical equal to or higher than those detailed in Table 13:- Technical specifications of the flange bronze bushing material.

EQUIVALENCES FOR FLANGED BRONZE BUSHING			
Material	UNI	UNS	MIL
Naval Bronze	BZn 4 UNI 1701 + 2% Ni	C85700	MIL-C-15345, ALLOY

Table 13:- Technical specifications of the flange bronze bushing material.

The biparted elastomeric bushing or similar naval type must have a low coefficient of friction, lubricated with water and be adjusted with interference in the bronze bushing with some type of element so that they can be disassembled, inspected and reinstall with the tail shaft in place.

The bushings must meet at least the following technical specifications:

Coefficient of friction(dry)	Until 0.35
Swell in water (%) @ 20°C	Maximum 1.3%
Minimum Operating Temperature Limit	60°C

Table 14:- Technical specifications of the elastomeric bushing.

#### Quantities and dimensions per corvette

Whereas, such bronze bushing and elastomeric bushing shall be installed on (02) strut, stern and stuffing box. The following table shows the measurements of flange bronze bushing and bushing elastomer below:

FLANGE BRONZE BUSHING / BUSHING ELASTOMER BIPARTED						
Item	Quant.	Length	Ø sleeve of Tail shaft	Ø inside of strut	Ø Outer flange	Flange thickness
	Unit	Mm (inch)	Mm (inch)	Mm (inch)	Mm (inch)	Mm (inch)

Tunnel	08	432 (17)	190,5 (7 1/2)	244,47(9 5/8)	360 (14 3/16)	14,3 (9/16)
Strut. Bw	04	432 (17)	190,5 (7 1/2)	244,47(9 5/8)	323,8(12 3/4)	14,3 (9/16)
Strut. St	04	844 (33 1/4)	190,5 (7 1/2)	244,47(9 5/8)	323,8(12 3/4)	14,3 (9/16)

**Table** ¡Error! No hay texto con el estilo especificado en el documento..**15.- Quantities and dimensions of flange bronze bushing/ bushing elastomer finished.**

#### Mechanical properties of flanged bronze bushing

The mechanical properties of flanged bronze bushing must at least comply with the parameters detailed in **Table** ¡Error! No hay texto con el estilo especificado en el documento..**16** below:

MECHANICAL CHARACTERISTICS OF THE ALLOY C-85700				
Tensile strength Mpa (Ksi)		Yield strength Mpa (Ksi)		Hardness BHN (500 kg)
276 (40)		97 (14)		75 (500Kg)

**Table** ¡Error! No hay texto con el estilo especificado en el documento..**16.- Mechanical properties of flanged bronze bushing.**

Certification of the material, origin and results of the tests carried out on the specimens produced by the factory is required.

#### Documentation to be delivered prior to receipt of the partial/total delivery certificate

Chemical composition of the elastomer bushing.

Certification of the material of the flanged bronze bushing.

Certificate Type Approval of the elastomer bushing.

Mechanical test results of the elastomer bushing.

#### PROPELLER

Fixed pitch propellers with their respective bishop nut are required, of which 06 must rotate clockwise and the other 06 counterclockwise. The propeller offered must be designed to have sufficient thrust for the vessel to reach a speed range of at least 24.5 to 26.0 knots of maximum sustained speed, and that it complies with the technical specifications detailed in the **Table** ¡Error! No hay texto con el estilo especificado en el documento..**17**:

PROPELLER TECHNICAL SPECIFICATIONS	
Diameter (mm)	1400
Number of blades	4
Approximate Weight (Kg)	485
Material	G-CuAlMn8, C-CuAL10Ni or similar
Manufacturing Tolerance	ISO 484/2 Class S

**Table** ¡Error! No hay texto con el estilo especificado en el documento..**17.- Technical specifications of the propeller.**



The propellers must be shipped ready to be installed, dynamically balanced of seat test of tail Shaft – Propeller.

**Note:**

- The data required for the calculation of the optimal propeller will be provided to the supplier once the process has been awarded.
- 2D drawing of nut and cap to be provided to supplier.

**Documentation to be delivered prior to receipt of the partial/total delivery certificate**

The following technical documentation must be submitted by the manufacturer in digital format, which will be required for partial or full payment.

Photographic record of seat test of tail Shaft - propeller

Dynamic balancing report.

Material certification

Chemical analysis

Mechanical Test Results

Propeller casting quality testing with penetrating inks

2D drawing of the propeller

IACS certification of the material

ISO 484/2-dimensional inspection

Verification of the settlement between the propeller cone and the shaft cone greater than 80%.

Verification of the adjustment of the keys

### SECTION III

#### OBLIGATIONS OF THE PARTIES

##### 2.1 Obligations of the Contractor:

1. The contractor undertakes to execute the contract derived from the procurement procedure processed, on the basis of the technical specifications or terms of reference prepared by ASTINAVE EP and which were known in the pre-contractual stage; and by virtue of this, it may not allege error, failure or any disagreement with them, as a cause to request an extension of the term, or complementary contracts. The extension of the term, or complementary contracts may be processed only if they are approved by the administration.
2. The contractor undertakes, during the execution of the contract, to provide the persons designated by ASTINAVE EP with all the information and documentation







MINISTERIO  
DE DEFENSA  
NACIONAL

that they request in order to have full technical knowledge related to the execution of the contract, as well as any technical problems that may arise and the technologies, methods and tools used to solve them.



**ASTINAVE EP**  
ASTILLEROS NAVALES ECUATORIANOS



#### SECTION IV TECHNICAL AND ECONOMIC OFFER FORMS

**PE-ASTEP-2025-065**

##### 1. GENERAL INFORMATION OF THE BIDDER.

**NAME OF THE BIDDER:** (determine if it is a natural person, legal entity, consortium or association; in the latter case, the members of the consortium or association will be identified. The legal representative, attorney-in-fact or common attorney, if applicable, will be determined).

I declare that my general data are:

City:	
Main Street	
No:	
Street (intersection):	



**EL NUEVO  
ECUADOR**



Phones:	
Email:	
Name of the Legal Represent	
Citizenship Certificate or Passport: (of the legal representative)	
R.U.C	

## 2. BANK INFORMATION FOR TRANSFER

Name of the Account / Beneficiary	
Complete address of the Beneficiary	
City and country of the Beneficiary	
Beneficiary Bank	
Account number or IBAN	
Swift Code or ABA of the Beneficiary Bank	
IBAN	
Intermediary bank	
Swift Code or ABA of the Intermediary Bank	

*Nota: La información que acredita al Banco Intermediario es obligatoria. Todos los formularios deben ser realizados con hoja membretada de su empresa.*

For proof of what is offered, I sign this form,

**SIGNATURE OF THE OFFEROR, HIS LEGAL REPRESENTATIVE, ATTORNEY-IN-FACT OR COMMON ATTORNEY (as the case may be)**

**Name:**

**Charge:**

**Date:**

## 3. TABLE OF QUANTITIES AND PRICES

The prices offered in the current contracting process are the following:

Description of the good or service	Unity	Quantity	Price Unitary	Total Price

**TOTAL:** (**detallar el total en letras**) dólares de los Estados Unidos de América.

In addition, I undertake to deliver the goods and services of this contract within the maximum period of: **XXXXX**

**(Detail payment method)**





(Detail the minimum offer duration to 60 days)

(Establish the term of the contract, which may not be longer than requested).

Note: The bidder may attach a quote and / or proforma with a different structure consigning the present information.

For proof of what is offered, I sign this form,

SIGNATURE OF THE OFFEROR, HIS LEGAL REPRESENTATIVE, ATTORNEY-IN-FACT OR COMMON ATTORNEY (as the case may be)

Name:

Charge:

Date:

#### 4. COMPONENTS OF THE GOODS OR SERVICES OFFERED

The offeror must fill out a table of the components of the (goods or services), which must include each and every one of the items offered, which respond to the requirements of ASTINAVE EP, in a detailed manner.

Technical Specification - Terms of Reference Required	Technical Specification - Terms of Reference Offered	Observation (meets/ doesn't meet)

I undertake to comply with each and every one of the technical specifications that are detailed in numeral 6.1 of the Technical Report of Need.







For proof of what is offered, I sign this form,

**SIGNATURE OF THE OFFEROR, HIS LEGAL REPRESENTATIVE, ATTORNEY-IN-FACT OR COMMON ATTORNEY (as the case may be)**

**Name:**

**Charge:**

**Date:**

## 5. OFFERER EXPERIENCE

### OVERALL EXPERIENCE

Contractor	Purpose of the contract (description of the goods or services)	Contract amount	Contract term	Execution dates		Observations
				Beginning	Ending	

### SPECIFIC EXPERIENCE





Contractor	Purpose of the contract (description of the goods or services)	Contract amount	Contract term	Execution dates		Observations
				Beginning	Ending	

Note: The type of experience required must be specifically detailed. Establish the number of contracts, their amounts in relation to the reference budget and the minimum years to credit it.

The General and specific experience will be validated with the delivery of the following supporting documents:

- Contracts; or,
- Purchase Orders; or
- Invoice

For proof of what is offered, I sign this form,

SIGNATURE OF THE OFFEROR, HIS LEGAL REPRESENTATIVE, ATTORNEY-IN-FACT OR COMMON ATTORNEY (as the case may be)

Name:

Charge:

Date:

## 6. CONFIDENTIALITY LETTER

Mrs.

Delegate of the Highest Authority  
ECUADORIAN NAVAL SHIPYARDS ASTINAVE EP

I presented. -

The undersigned, in response to the call made by ASTILLEROS NAVALES ECUATORIANOS - ASTINAVE EP, for the "ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT", declares that it is obliged to keep absolute confidentiality of the information entrusted to it and to which it may have access during the visits prior to the evaluation of the offer and if it is the successful bidder not to reveal even in writing, nor by word or by any other means or tangible or intangible support currently known or that makes possible the state of the art in the future, exchanged as a result of the contract and by virtue of the development and compliance in the event of being awarded





1. Use said information in a reserved manner.
2. Do not disclose or communicate the technical information provided by the other party.
3. Prevent the copying or disclosure of that information to third parties, except with the written approval of the other party, and only in terms of such approval.
4. Restrict access to information to its employees and subcontractors, to the extent that they may reasonably need it to fulfill their agreed tasks.
5. Not to use the information or fragments of it for purposes other than the execution of this contract.
6. The bidder will be responsible for the breach of this obligation, either by its employees or by subcontractors.

Failure to comply with what has been stated will result in ASTILLEROS NAVALES ECUATORIANOS - ASTINAVE EP exercising the corresponding civil and criminal legal actions and especially those determined in the Comprehensive Organic Criminal Code.

For proof of what is offered, I sign this form,

-----  
**SIGNATURE OF THE OFFEROR, HIS LEGAL REPRESENTATIVE, ATTORNEY-IN-FACT OR COMMON ATTORNEY (as the case may be)**

**Name:**

**Charge:**

**Date:**

## 7. TECHNICAL GUARANTEE

**NAME OF THE BIDDER:** .....

Mrs.

**Delegate of the Highest Authority  
ECUADORIAN NAVAL SHIPYARDS ASTINAVE EP**

I presented. -

The undersigned, in response to the invitation made within process **No. PE-ASTEP-2025-065** corresponding to the "**ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT**" process, renders in favor of Astilleros Navales Ecuatorianos -ASTINAVE EP-, this technical guarantee, under the following conditions:

The awarded bidder, in compliance with the requirements and other general and specific conditions for the "**TECHNICAL REPORT OF NEED FOR THE ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT**", will ensure







that all the requested goods comply with the specifications, chemical composition of the requested material and IACS certification, as described in the Technical Specifications.

The term of the technical guarantee will be 12 months for the elements of the first delivery and 18 calendar months for the elements of the second delivery, counted from the date of signature of the certificate of delivery and receipt. The technical warranty will validate that the goods are completely new from the factory, of optimal quality, that they are free of defects and manufacturing faults, and that they comply with the technical specifications, manufacturing standards and requirements demanded by ASTINAVE EP.

During the term of validity of the Technical Guarantee, if ASTINAVE EP requests the exchange of parts, or parts of the contracted good that have been considered defective, these will be replaced by new ones of the same quality and condition, at no additional cost to ASTINAVE EP within a maximum term of 90 days, counted from its notification.

For proof of what is offered, I sign this form,

**SIGNATURE OF THE OFFEROR, HIS LEGAL REPRESENTATIVE, ATTORNEY-IN-FACT OR COMMON ATTORNEY (as the case may be)**

**Name:**

**Charge:**

**Date:**

## 8. CARTA DE DECLARACIÓN Y RESPONSABILIDAD

Mrs.

**Delegate of the Highest Authority**

**ECUADORIAN NAVAL SHIPYARDS ASTINAVE EP**

I presented. -

The undersigned (for my own rights, if he is a natural person) / (as legal representative or representative of ..... if it is a legal entity), (in its capacity as common attorney of..., if it is an association or consortium), in response to the call (or invitation as appropriate) made by ASTILLEROS NAVALES ECUATORIANOS - ASTINAVE EP, for the "ACQUISITION OF COMPONENTS OF THE PROPULSION LINES FOR THE ZEUS PROJECT", under oath I inform that I have full knowledge of the disqualifications established in articles 62, 63 and 64 of the Organic Law of the National Public Procurement System; and, the provisions of Articles 250, 251, 252 and 253 of its General Implementing Regulations, as well as the prohibitions contemplated in Article 34 numeral 7 of the Organic Law of Public Enterprises.





Consequently, I declare that (not me, if it is a natural person) / (the majority shareholder is not ..... if it is a legal person), (the majority shareholders of each of the participants are not ..., if it is an association or consortium made up of legal persons), ), (the participants are not ..., if it is an association or consortium made up of natural persons) meeting (a)(an) incurring any of the disqualifications or prohibitions indicated in the preceding paragraph to enter into contracts with the State, In a special way, I endorse that there are no links up to the fourth degree of consanguinity and second degree of affinity with the active personnel of ASTILLEROS NAVALES ECUATORIANOS - ASTINAVE EP.

At the same time, it accepts that in the event of a violation of this statement, it assumes responsibility for the disqualification of its bid or the unilateral termination of the contract or national or foreign purchase order, as appropriate, enabling ASTINAVE EP to exercise the legal actions that assist it.

For proof of what is offered, I sign this form,

-----  
**SIGNATURE OF THE OFFEROR, HIS LEGAL REPRESENTATIVE, ATTORNEY-IN-FACT OR COMMON ATTORNEY (as the case may be)**

**Name:**

**Charge:**

**Date:**

**Nota:** Everything shaded green, once read, should be erased.

Everything shaded yellow, must be modified by the user.

The offer and the validation of errors will be submitted by email to the [gmatute@astinave.com.ec](mailto:gmatute@astinave.com.ec) address, on your company's letterhead following the format of the forms; in addition, you must attach the supports or annexes that prove the information detailed in the forms and all the information that you consider relevant in order to comply with the conditions established in the terms of reference.

